



MINISTRY OF HUMAN RESOURCES

TalentCorp



# Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Phase 2, Volume 2

Sector:  
**Communications  
& Multimedia:**  
**Telecommunications,  
Broadcasting, and Postal  
and Courier**



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**Communications & Multimedia:  
Telecommunications,  
Broadcasting, and Postal and  
Courier**

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# Preface by the Minister of Human Resources (KESUMA)

Malaysia's ambition to become a high-income, innovation-driven nation depends on developing a workforce equipped to thrive in an increasingly dynamic global economy. As we advance the aspirations of Ekonomi MADANI and implement national priorities under frameworks such as the New Industrial Master Plan 2030 (NIMP 2030), the National Energy Transition Roadmap (NETR), and Malaysia's digital transformation agenda, human capital remains the foundation of sustainable economic growth and national competitiveness.

The Communications and Multimedia (C&M) sector is a key enabler of Malaysia's digital economy, driving innovation, strengthening connectivity, and supporting economic growth across industries. As artificial intelligence (AI), advanced digital technologies, and the green transition continue to reshape industries, the sector is creating new opportunities while redefining the skills and capabilities required of the workforce.

The Impact Study of AI, Digital, and the Green Economy on the Malaysian Workforce reflects the Ministry of Human Resources (KESUMA)'s commitment to evidence-based policymaking and forward-looking workforce planning. Its findings provide valuable insights into how technological transformation will reshape occupations, skills requirements, and workforce demand, enabling government, industry, academia, and training providers to make informed decisions that strengthen Malaysia's talent ecosystem. The collaboration between Talent Corporation Malaysia Berhad (TalentCorp) and the Malaysian Communications and Multimedia Commission (MCMC) further demonstrates the importance of cross-government and industry partnerships in ensuring workforce strategies remain responsive to emerging trends and future industry needs.

The study reinforces an important message: technological advancement should not be viewed as a threat to employment, but as an opportunity to strengthen workforce readiness, raise productivity, and create pathways into higher-value jobs. Preparing Malaysia's workforce cannot be the responsibility of the government alone. Employers, industry associations, education and training institutions, and workers themselves each have an important role in fostering a culture of lifelong learning and ensuring talent development remains aligned with evolving industry needs. Through close collaboration, we can build a workforce that is agile, innovative, and equipped not only to adapt to change, but to lead it.

KESUMA remains committed to strengthening policies and initiatives that empower Malaysians throughout their career journeys while supporting businesses in accessing the talent they need to remain competitive. Studies such as this provide an important evidence base to guide national workforce planning and ensure our talent development efforts continue to meet the demands of a rapidly evolving economy. I commend TalentCorp, MCMC, industry leaders, academia, and all stakeholders who contributed their expertise and commitment to this important study. May its findings guide meaningful action, strengthen collaboration across the public and private sectors, and support Malaysia's journey towards becoming a more competitive, inclusive, and future-ready nation.

**YB Dato' Sri Ramanan Ramakrishnan**  
Minister of Human Resources  
(KESUMA)

“

**The Communications and Multimedia (C&M) sector is a key enabler of Malaysia's digital economy, driving innovation, strengthening connectivity, and supporting economic growth across industries.**

”

**YB Dato' Sri Ramanan  
Ramakrishnan**  
*Minister of Human Resources  
(KESUMA)*



# Preface by the Minister of Communications

Malaysia's ability to remain connected, informed and competitive depends on the strength of its communications and multimedia sector — and the people who drive it.

The sector is fundamental to how Malaysians live, work and participate in society. It connects communities, supports businesses, enables broadcasting and content delivery, and facilitates postal and courier services across the country. Its continued progress is therefore closely linked to Malaysia's economic resilience, social well-being and national development.

Artificial intelligence, digitalisation, automation and the transition to a Green Economy are accelerating change across the sector. Job roles are evolving, new capabilities are emerging and existing workers must be supported to adapt. These developments also present opportunities to improve services, strengthen productivity and create new areas of economic growth.

The Impact Study of AI, Digital, and Green Economy on the Communications and Multimedia Sector provides an important basis for action.

Developed by the Malaysian Communications and Multimedia Commission (MCMC) in strategic collaboration with Talent Corporation Malaysia Berhad (TalentCorp), the study helps us understand how roles and skills are changing across Telecommunications, Broadcasting, and Postal and Courier sector. More importantly, it provides a basis for preparing Malaysians to participate in and benefit from this transformation.

Technological progress must ultimately create meaningful benefits for people. Malaysians must be equipped not only to participate in a changing economy, but also to secure better opportunities, build sustainable careers and contribute confidently to the country's future.

The study identifies emerging job roles, capabilities and workforce needs. Its findings can support closer alignment between industry requirements and education and training pathways, as well as more targeted upskilling and reskilling for workers at different stages of their careers.

Our responsibility is to ensure that Malaysia has the talent required to build resilient connectivity, strengthen trusted communications, support responsible innovation and extend the benefits of communications services to every community. Malaysia's ambition must be to develop a workforce that is skilled, adaptable and ready to shape the opportunities created by technological change.

I commend MCMC, TalentCorp and all stakeholders who contributed their expertise and perspectives to this important initiative.

By investing in our people today, we can build a more connected, inclusive and competitive Malaysia for the future.

**YB Dato' Seri Fahmi Fadzil**

Minister of Communications

“

**Skilled people.  
Greater opportunities.  
A stronger Malaysia.**

”

**YB Dato' Seri Fahmi Fadzil**  
*Minister of Communications*





# Preface by the Chairman of the Malaysian Communications and Multimedia Commission (MCMC)

The transformation of the communications and multimedia sector must be accompanied by deliberate and sustained efforts to ensure that its workforce is equipped for the demands of the future.

Artificial intelligence, digitalisation, automation and the transition towards a Green Economy are fundamentally reshaping the way telecommunications, broadcasting, as well as postal and courier services are designed, delivered and managed. As technologies advance and business models evolve, the sector must strengthen its capabilities to remain resilient, competitive and responsive to changing needs.

Recognising the importance of workforce readiness in navigating these changes, the Malaysian Communications and Multimedia Commission (MCMC), in strategic collaboration with Talent Corporation Malaysia Berhad, undertook the Impact Study of AI, Digital, and Green Economy on the Communications and Multimedia Sector.

The Study brings together insights and contributions from government, industry, academia and training institutions to establish a common evidence base on how technological and economic shifts are influencing job roles, skills requirements and workforce needs across the sector. It provides a forward-looking assessment of the capabilities that will be increasingly important as the sector continues to evolve.

However, the value of this work ultimately lies not only in the insights it provides, but in how these findings are translated into meaningful action.

Building on the findings of the Study, the Communications and Multimedia Sector Future Skills Framework provides practical guidance on emerging job roles, priority skills, career pathways and relevant learning opportunities. It is intended to serve as a useful reference for employers, workers, educators, training providers and policymakers in making informed decisions on workforce development and ensuring that skills development remains closely aligned with the needs of a changing sector.

For MCMC, the findings of this Study will further strengthen our ability to anticipate emerging workforce needs and facilitate a more coordinated and responsive approach across the sector. We will continue to work closely with industry and other stakeholders to encourage targeted upskilling and reskilling, strengthen the alignment between training and employment needs, and support more effective workforce planning.

This initiative also reflects MCMC's responsibility beyond regulation. As a convener and catalyst for sector development, we have an important role in bringing stakeholders together, establishing shared priorities and supporting collective action.

Building a future-ready workforce cannot be achieved by any one organisation. It requires credible evidence, clear implementation pathways and sustained commitment across the ecosystem.

I extend my sincere appreciation to TalentCorp and all stakeholders who contributed their knowledge, experience and perspectives to this study.

As Malaysia advances its Digital and Green Economy ambitions, a future-ready workforce will be critical to ensuring that the communications and multimedia sector remains a strong enabler of economic growth, innovation and national development. This Study is therefore not an end in itself, but an important step towards building the capabilities, opportunities and talent needed to navigate the transformation ahead.

**YBhg. Tan Sri Mohamad Salim bin Fateh Din**

Chairman

Malaysian Communications and Multimedia Commission (MCMC)

“

**Technology may transform the sector  
but people will shape its future**

”

**YBhg. Tan Sri Mohamad Salim**

**bin Fateh Din**

**Chairman**

**Malaysian Communications and  
Multimedia Commission (MCMC)**





# Preface by the Group Chief Executive Officer of TalentCorp

Malaysia is entering a defining moment where the strength of our talent will determine the strength of our economy. AI, digitalisation, and the green transition are advancing faster than traditional workforce systems can respond, pushing industries to compete not just on technology, but on skills, agility, and adaptability.

To remain competitive, Malaysia must build capabilities ahead of demand. This Impact Study of AI, Digital, and the Green Economy on the Malaysian Workforce serves as a strategic lens into what the future requires, grounding our national ambition in clear evidence and actionable insights. It shows that the shifts reshaping our economy are already underway, and that preparing our workforce cannot be approached as business as usual, but as a coordinated national priority.

Phase 2 of this Impact Study builds on the foundation laid by Phase 1, expanding our analysis to 12 additional sectors that are critical to the nation’s growth. Together, both phases present the most comprehensive understanding to date of how AI, digitalisation, and the green transition will restructure talent needs, reshape job profiles, and redefine workforce competitiveness.

As the strategic think tank to the Ministry of Human Resources (KESUMA), TalentCorp is committed to ensuring that Malaysia’s labour market and talent strategies stay ahead of these shifts. Our work does not stop at analysis, we are translating insights into action through policy recommendations, employer engagement, student awareness, and platforms such as TalentCorp’s MyMahir.my, which continues to evolve as Malaysia’s national gateway for future skills development.

For the Communications and Multimedia (C&M) sector, this study was undertaken on a collaborative basis with the Malaysian Communications and Multimedia Commission (MCMC). This partnership reflects the joint responsibility of both institutions in ensuring that the sector’s workforce not only adapts to disruption but is empowered to drive Malaysia’s digital future.

The findings of this study reinforce one message: no single stakeholder can navigate these disruptions alone. Phase 2 was made possible by the active collaboration of employers, policymakers, academia, and training providers. It is a reminder that practical, actionable change is only possible when all parts of the ecosystem move together. Industry must invest in capability-building. Educators must redesign learning for emerging skills. Policymakers must enable agility, mobility, and innovation. And Malaysians must embrace lifelong learning as a shared responsibility and national mindset. This collaboration with MCMC for the C&M sector stands as a model of how joint leadership can deliver practical, actionable change.

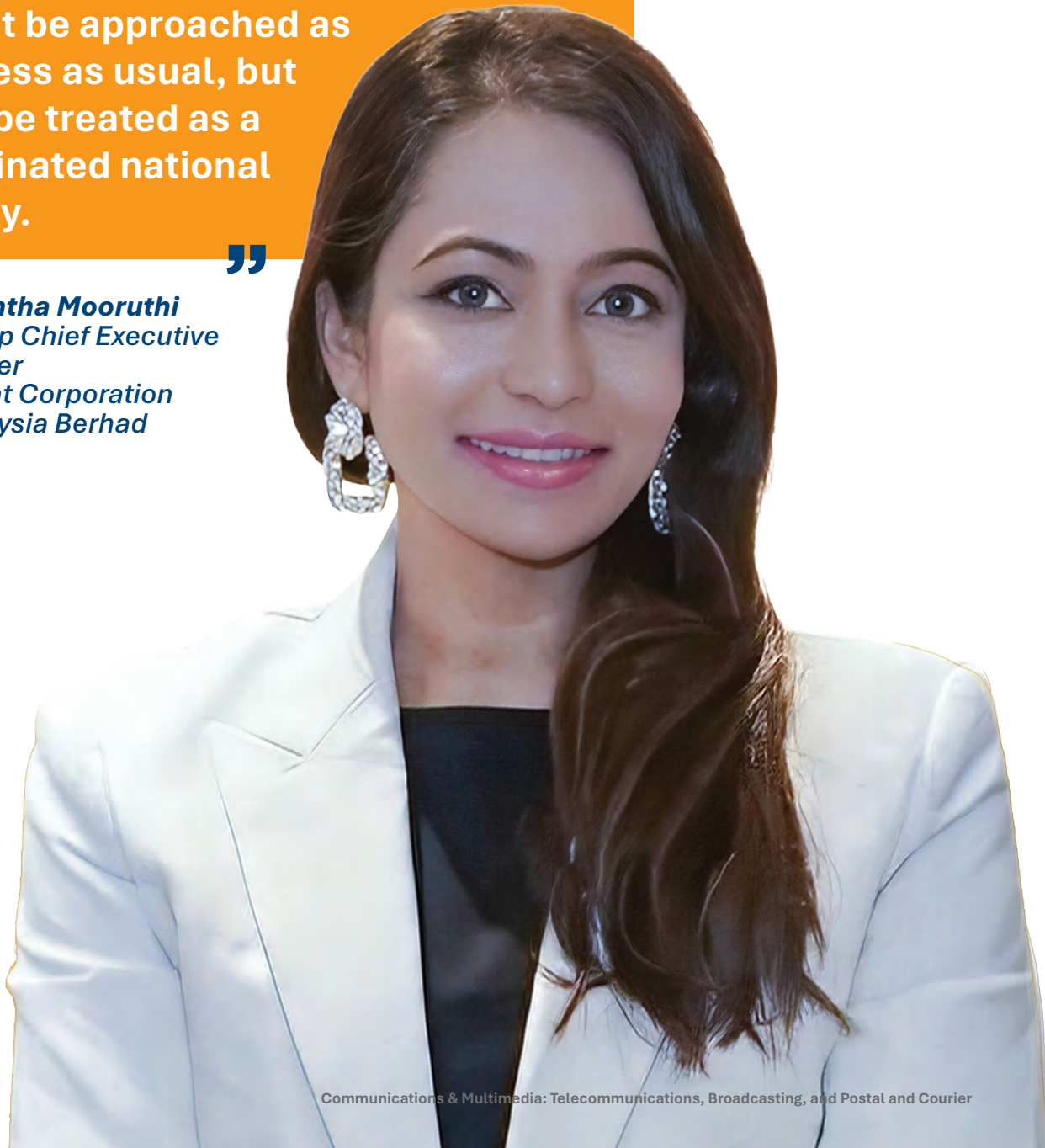
On behalf of TalentCorp, I would like to thank our partners, industry leaders – especially members of our TalentCorp MyMahir Future Skills Talent Council (FSTC) – and colleagues for their invaluable contributions. This study is a call to action and a blueprint for a more innovative, sustainable, and inclusive future of work for Malaysia.

Let us move forward together, with purpose and confidence, toward a Malaysia that grows because its talent grows.

**Biruntha Mooruthi**  
Group Chief Executive Officer  
Talent Corporation Malaysia Berhad (TalentCorp)

“  
**Malaysia is entering a defining moment where the strength of our talent will determine the strength of our economy. Preparing our workforce for this transformation cannot be approached as business as usual, but must be treated as a coordinated national priority.**  
”

**Biruntha Mooruthi**  
*Group Chief Executive Officer  
Talent Corporation  
Malaysia Berhad*



# Executive Summary

The Communications & Multimedia sector has evolved remarkably over the years, becoming a cornerstone of human progress and connection. What began as a simple exchange of messages has grown into a dynamic global ecosystem that drives economies, shapes culture, and unites communities. In Malaysia, the birth and rapid growth of the convergent Communications & Multimedia sector in the mid-1990s marked a new era of digital transformation. Since then, the sector has been instrumental in advancing education, inclusion, and innovation, while strengthening national identity through storytelling and responsible media. Today, it remains central to Malaysia’s vision for a connected, sustainable, and resilient digital future.

This report dives into three (3) distinct sub-sectors under the umbrella of the Communications & Multimedia sector, namely: the Telecommunications sector, Broadcasting sector, and Postal and Courier sector.

### Telecommunications sector

Malaysia’s Telecommunications sector serves as a vital enabler of national digital transformation, characterised by strong competition among key players and reinforced by major government-led initiatives such as Jalanan Digital Negara (JENDELA). The sector has achieved remarkable progress, with 5G population coverage reaching approximately 92% by Q3 2024 and consumer adoption surpassing 56% by early 2025.<sup>1</sup> This rapid infrastructure expansion, supported by extensive fibre optic deployment and pioneering trials of Low Earth Orbit (LEO) satellite connectivity, is establishing the foundation for an inclusive, high-performance digital ecosystem.

The sector contributed an estimated RM73.16 billion, or around 4% of Malaysia’s GDP, and employs over 286,000 workers across infrastructure, services, customer, and support subsectors, with 573 licensed operators nationwide.<sup>2</sup>

Despite its strong growth, the industry faces persistent challenges, including high deployment costs, uneven infrastructure coverage in rural areas, and limited public awareness of 5G applications. In addition, the underdeveloped participation of Micro, Small, and Medium Enterprises (MSMEs) within the 5G value chain risks widening the gap between technological advancement and economic inclusivity.<sup>3</sup> These challenges underscore the need for continued policy support, targeted incentives, and digital upskilling to ensure the benefits of next-generation connectivity are shared equitably across all segments of society.

The Telecommunications sector is simultaneously undergoing a profound transformation driven by AI, Digital, and Green Economy. While the adoption of AI remains at a medium stage of maturity, it is increasingly central to improving operational efficiency, network management, and customer experience. At the same time, sustainability considerations are gaining importance as energy-intensive 5G networks require up to three (3) times more power than earlier generations. However, adoption of green network practices remains relatively low. Moving forward, greater emphasis on AI integration, renewable energy, and circular economy principles will be essential to build a more efficient, sustainable, and future-ready telecommunications ecosystem for Malaysia.

### Broadcasting sector

Malaysia’s Broadcasting sector continues to grow steadily, generating an intermediate input value of RM5.98 billion in 2022 and supporting 16,169 employees across four sub-sectors: production, technical, sales and advertising, and support.<sup>4</sup> Furthermore, data from the Malaysian Communications and Multimedia Commission (MCMC) indicates that the sector operates through 35 licensed operators that play a central role in delivering information, education, and entertainment to the public. As Over-The-Top (OTT) players expand their market share, traditional broadcasters are diversifying their offerings, maintaining their presence on cable, terrestrial, satellite TV, and radio, while investing in digital-first and on-demand content to engage audiences across multiple platforms.

The sector is simultaneously undergoing a transformation shaped by global trends in AI, Digital, and the Green Economy. These forces are redefining how content is created, distributed, and monetised, while influencing business models and workforce requirements. However, unlike in some other industries, Malaysia’s Broadcasting sector has yet to introduce dedicated AI-specific job roles. Instead, AI and digital capabilities are being embedded within existing functions, expanding professional responsibilities rather than creating entirely new positions.

These shifts are placing new demands on the workforce, calling for continuous upskilling and adaptability. Traditional roles are being reshaped as automation, digital production systems, and data-driven workflows reduce dependence on manual processes and create opportunities for higher-value creative and analytical functions. Strengthening digital literacy and fostering innovation across the ecosystem will be essential to ensure Malaysia’s broadcasting landscape remains competitive, inclusive, and aligned with the nation’s broader digital ambitions.

The development of Malaysia’s Broadcasting sector is guided by national priorities that emphasise media digitalisation, local content creation, and socio-cultural nation-building, ensuring a balance between commercial growth and public interest. The MCMC Technology Roadmap, aligned with the Malaysian Technical Standards Forum Bhd Strategic Plan 2025–2030, charts Malaysia’s path toward advanced digital

infrastructure. It focuses on expanding broadband access through JENDELA, completing the transition to digital television via myFreeview, and advancing 5G-enabled broadcasting technologies. The roadmap also highlights the adoption of hybrid broadcast broadband, AI integration, and sustainable practices, supported by complementary frameworks such as CMIR 2030, MCMC Nexus, and modernised infrastructure systems that strengthen Malaysia’s position as a regional hub for digital broadcasting and communications.<sup>5</sup>

### Postal and Courier sector

Malaysia’s Postal and Courier sector is undergoing a major transformation from traditional mail services to a parcel-centric, e-commerce-driven logistics ecosystem. Regulated under the Postal Services Act 2012 and overseen by the Malaysian Communications and Multimedia Commission (MCMC), the sector ensures efficient, affordable, and high-quality postal access nationwide. With activities spanning letter collection, delivery, and digital solutions, the industry is valued at RM6.58 billion in 2025 and projected to reach RM10.25 billion by 2030, reflecting a 9.24% Compound Annual Growth Rate (CAGR).<sup>6</sup> This growth is underpinned by rising parcel volumes with 37.2 per capita in 2024, and supported by one universal service licensee (Pos Malaysia) and over 100 courier operators employing nearly 138,000 workers.<sup>7</sup>

The sector’s rapid evolution is driven by digitisation, changing consumer expectations, and the boom in e-commerce, prompting investment in infrastructure such as PUDO points, road networks, and greener vehicle fleets. However, the sector faces persistent challenges including limited rural accessibility, lack of postcodes in certain areas, and high operational costs linked to global fuel prices. These factors hinder last-mile efficiency and affordability. As Malaysia transitions toward a technology-enabled, parcel-focused delivery ecosystem, the adoption of digitalisation and automation will be critical for maintaining competitiveness, ensuring reliability, and achieving full inclusion across both urban and remote communities.

National initiatives such as the Pelan Accelerator Kurier Negara (PAKEJ), under the Twelfth Malaysia Plan (RMKe-12), are steering this transition in alignment with MyDIGITAL and NESR 2.0 through

1. Mordor Intelligence, Malaysia Telecom Market Size & Share Analysis - Growth Trends and Forecast (2025–2030), 2024

2. Department of Statistics Malaysia (DOSM)

3. The Star, Outlook for telco segment remains positive, 5 September 2024, <<https://www.thestar.com.my/business/business-news/2024/09/05/outlook-for-telco-segment-remains-positive>>

4. Department of Statistics Malaysia (DOSM). 2023.

5. MCMC, Strategic Communications and Multimedia Technology Roadmap 2025-2030 (MyTMAP2030), 2025

6. Mordor Intelligence Inc.. (n.d.). Malaysia Courier, Express, and Parcel (CEP) Market. <<https://www.mordorintelligence.com/industry-reports/malaysia-courier-express-and-parcel-cep-market>>

7. Malaysian Communications and Multimedia Commission (MCMC). (2025). P-C4Q-2024 BI [Quarterly statistics]. <[https://www.mcmc.gov.my/skmmgovmy/media/General/Resources/Statistics/2025/P-C-4Q-2024\\_BI.pdf](https://www.mcmc.gov.my/skmmgovmy/media/General/Resources/Statistics/2025/P-C-4Q-2024_BI.pdf)>



four (4) key pillars: Reliability, Reach, Relevance, and Resilience (4R).<sup>8</sup> To future-proof the sector, Malaysia must accelerate the integration of AI, Digital, and Green Economy. Globally, postal operators are leveraging technologies like IoT, predictive analytics, and automated routing to enhance speed, reduce costs, and minimise carbon emissions. For Malaysia, adopting similar innovations will be vital to overcome last-mile inefficiencies, promote sustainability through green fleets and waste reduction, and strengthen the nation’s position as a digitally connected and environmentally responsible logistics hub.

Future-proofing Malaysia's Communications & Multimedia Sector

To remain competitive and adapt to the accelerating influence of AI, Digital, and Green Economy, Malaysia’s Communications & Multimedia sector must prioritise strategic upskilling and reskilling initiatives to ensure workforce resilience. The study identified the need to prioritise strategic upskilling and reskilling initiatives to equip workers in at-risk roles with new capabilities, enabling their transition into higher-value positions within the same sector or adjacent industries. Developing a

future-ready talent pipeline is essential to sustain the sector in an increasingly competitive and rapidly evolving environment.

The study also mapped each sub-sector’s value chain, job clusters, roles, and associated skills to provide a comprehensive understanding of workforce dynamics across the Telecommunications, Broadcasting, and Postal and Courier sectors. It identified a range of in-demand skills deemed critical for future readiness, alongside existing roles that remain integral to maintaining operational standards and efficiency. These roles vary in their pace of transformation, with some evolving rapidly, others adapting gradually, while certain roles remain core to ensuring business continuity. Additionally, new and emerging roles were identified in the Postal and Courier, as well as Telecommunications sectors, reflecting the industries’ ongoing transition toward digitalisation and innovation.

To empower the workforce and navigate the evolving landscape, the study proposes several strategic initiatives under a collaborative Government-Industry-Academia-Training Providers (GIAT) model. These recommendations are designed to foster talent development through the following:

Telecommunications sector:

GOVERNMENT

INDUSTRY PLAYERS

ACADEMIA

TRAINING PROVIDERS

**IN1:** Launch a Future Telecommunications Talent Initiative (FTTI) Programme

**IN2:** Sustainability-Focused Talent Development in Communication

**IN3:** Synergise National Telecommunications and Digital Policy

**IN4:** Upskill Internal Talents in Emerging Technologies

**IN5:** Embed AI in Internal Network Operations and Integrate Sustainability into System Design

**IN6:** Invest in R&D Partnerships with Universities Focused on AI, Digital, and Green Economy

**IN7:** Embed AI, Digital, and Green Economy Elements into Telecommunications Curriculum

**IN8:** Address Time-to-Talent Bottlenecks via Project-Based and Fast-Track Pathways

**IN9:** Co-Develop Capstone Projects and Living Labs with Industry Partners

**IN10:** Develop Training Programmes for AI, Digital, and Green Economy by Onboarding Local Skilled Talents

8. MCMC. (2021). Malaysian Communications and Multimedia Commission MCMC announces five-year roadmap PAKEJ for courier services. <<https://www.mcmc.gov.my/en/media/press-clippings/mcmc-announces-pakej-a-five-year-roadmap-set-to-en>>

Broadcasting sector:

GOVERNMENT

INDUSTRY PLAYERS

ACADEMIA

TRAINING PROVIDERS

**IN1:** Enhance Content Code 2022 to Embed AI Ethics

**IN2:** Establish AI Content Verification & Disclosure Mechanisms

**IN3:** Define IP Ownership & Attribution for AI-Generated Broadcast Content

**IN4:** Strategic Government Support Initiative for the Development of AI-Enabled Virtual Labs and Smart Studios

**IN5:** Establish AI and Digital Focused Internships for Broadcast Technical Roles

**IN6:** Upskill Mid-Career Broadcast Talent for AI Adoption

**IN7:** Develop AI and Digital Training Labs for Broadcasting

**IN8:** Upskilling Faculty through Industry-based AI & Digital Media Exposure

**IN9:** Developing AI and Advanced Digital Media Programmes for Industry Needs

**IN10:** Upskilling Trainers through Industry-based AI & Digital Media Exposure

Postal and Courier sector:

GOVERNMENT

INDUSTRY PLAYERS

ACADEMIA

TRAINING PROVIDERS

**IN1:** Introduce Targeted Funding Schemes to Accelerate AI, Digital, and Green Transformation

**IN2:** Empower AI, Digital, and Green Economy Literacy and Awareness Through Social Media Content Creator-led Ecosystems

**IN3:** Leverage Available Financial Incentives to Invest in AI, Digital, and Green Transformation for Long-term Operational Gains

**IN4:** Adopt AI-driven Network Operations and Embed Sustainability Principles into System Design and Management

**IN5:** Foster Research and Development (R&D) Collaboration with Universities to Drive Innovation in AI, Digital, and Sustainable Network Infrastructure

**IN6:** Develop a Standardised, Industry-Aligned Syllabus to Bridge Skills Gaps in AI, Digital, and Green Logistics

**IN7:** Strengthen Academic-Industry Collaboration to Align Graduate Skills with Sector Transformation Needs

**IN8:** Expand Training Capacity to Develop Local Talent for AI, Digital, and Green Transformation

**IN9:** Introduce Subsidised and Co-Funded Training Schemes to Support Workforce Upskilling in AI, Digital, and Green Practices



## Chapter 1: **Introduction of the Study**

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# Introduction of the Study



## Background

As Malaysia’s national agency with a mandate to drive the country’s talent strategy towards making Malaysia a dynamic and market-driven global talent hub, Talent Corporation Malaysia Berhad (TalentCorp) plays a pivotal role in ensuring the workforce remains agile, future-ready, and aligned with national economic aspirations. In March 2024, TalentCorp was appointed as the strategic think tank for the Ministry of Human Resources (KESUMA). This appointment underscores TalentCorp's commitment to driving Malaysia's talent strategy towards becoming a dynamic talent hub. Recognising the profound shifts brought by Artificial Intelligence (AI), Digital, and Green Economy, TalentCorp initiated this multi-phase impact study to

assess their implications for Malaysia’s workforce.

Phase 1 of TalentCorp's Impact Study, launched on 18 November 2024, established a strategic baseline by delivering vital insights into how emerging economic forces—AI, Digital, and Green Economy—are shaping employment trends across 10 key sectors. Beyond providing a baseline, this Phase 1 played a pivotal role in raising awareness and guiding early workforce strategies to address these transformative shifts. The insights from Phase 1 highlight the urgency for proactive measures to address workforce challenges, making Phase 2 a pivotal next step in shaping Malaysia's future-ready workforce.



### Recap: Key Takeaways from Phase 1 Impact Study

**All sectors have adopted digitalisation, although at different paces**

- Three (3) sectors indicated a higher degree of AI adoption as a result of advanced automation
- Three (3) others highlighted higher adoption of Green Economy practices due to regulatory requirements

**A total of 949 roles were validated across the 10 sectors**

- 889 roles (94%) represent existing positions
- 60 roles (6%) are emerging roles and are expected to be increasingly in demand in the next three (3) to five (5) years

**Approximately 620,000 employees are expected to be highly impacted in the next three (3) to five (5) years**

- Represents approximately 18% of the total 3.5 million employees in the core business across the 10 sectors
- Including medium impacted employees, an estimated 1.8 million employees, or 53%, are projected to be affected

### 60 emerging roles will become increasingly important

- 43 roles (72%) are AI and Digital-related roles such as AI engineers and data scientists
- 11 roles (18%) are “Green” roles such as sustainability specialists and energy economists
- 6 roles (10%) are “New Tech” roles such as autonomous/remote operator

### Highly Impacted roles can pivot to other roles within or across sectors

- Skills transferability will become increasingly desired and the norm
- Upskilling is a necessity to future-proof the workforce - No longer an option for talent development and retention for the next three (3) to five (5) years

### In-demand Specific Skills are AI, Digital, and Green Economy related

- Specific skills in demand revolve around data, for example, Data Engineering, Data Visualisation, and Data Management
- Digital and AI Fluency and Sustainability Awareness are two (2) examples of basic skills that future workforce must have

Building on these insights, Phase 2 expands the study’s scope to 12 additional sectors, including Healthcare, Tourism, Hotel and Accommodation Services, Oil and Gas, Public Transport, Automotive, Communications and Multimedia, Energy and Power

(Retail and Commercial), Construction, Air Transport, Sea Transport, and Agriculture (Commodities). This expansion enables a broader and deeper assessment of workforce dynamics, ensuring comprehensive coverage of Malaysia’s economic landscape.

## Purpose of the Study

Phase 1 laid the groundwork for understanding the transformative impact of AI, Digital, and Green Economy on Malaysia's workforce. Phase 2 will build on these findings by delving deeper into more key sectors of Malaysia’s economy.

In its pursuit of a knowledge-driven, technology-intensive economy, Malaysia leverages this study as a strategic tool to align workforce policies with evolving industry needs. TalentCorp, leading the charge, ensures that Phase 2 delivers actionable insights to empower policymakers, industries, and talents in navigating the changing world of work. This shift is also reflected in Malaysia’s broader economic agenda, which aims to transition from a labour-intensive, commodity-based economy to one that is knowledge-centric and technologically sophisticated. This transformation aligns with the aspirations of the MADANI Economy and key national blueprints, including the New Industrial Master Plan 2030 (NIMP 2030), Malaysia Digital Economy Blueprint (MDEB), and Twelfth Malaysia Plan (RMKe-12).

Phase 2 of the study continues to focus on key sectors that are instrumental in Malaysia’s economic growth.

By expanding the study’s scope, Phase 2 aims to provide deeper insights into workforce dynamics, sectoral shifts, and emerging skill demands. This will equip policymakers and industry leaders with the knowledge needed to navigate future challenges and opportunities.

The outcomes of this study also contribute to skills taxonomy, which is integrated into the MyMahir platform. This platform offers comprehensive insights into industry trends, job roles, required skills, career pathways, and training opportunities. By leveraging the findings from Phase 2, MyMahir enhances its value as a strategic tool for stakeholders seeking to understand and prepare for the evolving world of work in Malaysia.

However, workforce planning cannot be done in isolation. The rapid transformation of industries worldwide, driven by AI, Digital, and Green Economy, has a profound impact on Malaysia’s economic trajectory. To ensure that local talent remains competitive, it is crucial to analyse how global trends are shaping workforce demands and industry evolution. This study



examines these shifts across all sectors covered in Phase 2, ensuring a comprehensive understanding

of how Malaysia’s workforce must adapt to align with international developments.

The Rise of AI and Digital: A Global Perspective



The global market has experienced significant growth since the start of 2025, propelled by the rapid integration of advanced technologies such as AI, cloud computing, and big data analytics.<sup>9</sup> AI, in particular, has become central to business evolution, with 72% of companies already incorporating AI into their operations, a notable increase from previous years. Despite this momentum, a substantial readiness gap persists. The Cisco 2024 AI Readiness Index reveals that only 13% of organisations worldwide are fully prepared to harness AI’s potential, a

slight decline from 14% in the previous year. This indicates that while AI adoption is accelerating, many companies are still navigating challenges related to infrastructure, talent, and strategic alignment.<sup>10</sup>

Navigating AI and Digital Adoption: Strategic Approach

Nonetheless, the urgency to deploy AI solutions is intensifying. A staggering 98% of organisations report increased perceived pressure over the past year to

implement AI technologies, with 85% believing they have less than 18 months to establish an effective AI strategy or risk negative business impacts. This urgency is predominantly driven by CEOs and leadership teams in 50% of organisations, underscoring the strategic importance placed on AI at the highest executive levels. Investment in AI is also on the rise. Currently, 50% of companies allocate between 10% and 30% of their IT budgets to AI initiatives, with expectations to nearly double these investments in the coming years. However, as highlighted in the Phase 1 Impact Study, AI adoption varies across sectors, underscoring the complexities involved in translating AI investments into tangible business outcomes.<sup>11</sup>

In summary, while the integration of AI and related technologies are reshaping industries and driving business transformation, significant challenges remain. Organisations must address readiness gaps, align strategic initiatives, and manage investments effectively to fully realise the benefits of AI in the evolving global market.

Green Economy: Path to Sustainability

As of 2025, the global community stands at a critical juncture in addressing the escalating climate crisis.<sup>12</sup> With the United Nations (UN) emphasising the urgent need for transformative action to mitigate severe environmental consequences, current policies suggest that global temperatures could rise by approximately 3.1°C by 2100, significantly exceeding the Paris Agreement targets.<sup>13</sup> In response, the UN Environment Programme’s 2024 Emissions Gap Report highlights the necessity for stronger climate pledges and immediate action to reduce greenhouse gas emissions. To limit warming to 1.5°C, global emissions must peak

before 2025 and then decline by 43% by 2030. With 80% of individuals across eight (8) countries urging their governments to implement more ambitious climate policies, there is a compelling mandate for an accelerated transition to renewable energy, stricter emissions regulations, and enhanced climate financing strategies.

Accelerating the Green Transition: Challenges and Opportunities

Organisations worldwide are intensifying their commitment to sustainability by aligning investment portfolios with net-zero targets.<sup>14</sup> An increasing number of firms are channelling funds toward green technologies and renewable energy, ensuring financial systems play a key role in the transition to a low-carbon economy.<sup>15</sup> These financial shifts are essential for driving large-scale climate solutions and encouraging industries to adopt cleaner practices. Technological innovation remains a fundamental pillar of global climate strategies. Over 40 nations have launched collaborative initiatives focused on clean technology development in hard-to-abate sectors such as power generation, transportation, steel production, hydrogen fuel, and agriculture. With these priorities, countries aim to reduce costs, improve scalability, and accelerate the adoption of sustainable solutions.

As Malaysia moves toward a more sustainable and technologically advanced economy, it must not only keep pace with these global shifts but also identify sector-specific strategies to maximise their benefits. Understanding how these trends impact local industries, workforce requirements, and economic resilience is essential for effective policy-making and business adaptation.

9. World Economic Forum. (2025). *The future of jobs report 2025*. World Economic Forum. <<https://www.weforum.org/publications/the-future-of-jobs-report-2025/>>  
10. Cisco.(2024). *AI readiness index 2024*. Cisco Systems. <[https://www.cisco.com/c/m/en\\_us/solutions/ai/readiness-index.html](https://www.cisco.com/c/m/en_us/solutions/ai/readiness-index.html)>

11. Cisco. (2025). *Cisco unveils AI defense to secure the AI transformation of enterprises*. Cisco Systems. <<https://newsroom.cisco.com/c/r/newsroom/en/us/a/y2025/m01/cisco-unveils-ai-defense-to-secure-the-ai-transformation-of-enterprises.html>>  
12. United Nations. (2025). *The climate crisis: 5 things to watch out for in 2025*. <<https://news.un.org/en/story/2024/12/1158446>>  
13. United Nations. *The Paris Agreement*. <<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>>  
14. University of Oxford, *Department of Sociology*. (2025). *80% of people worldwide want stronger climate action by governments, according to new survey*. <<https://www.sociology.ox.ac.uk/article/80-of-people-worldwide-want-stronger-climate-action-by-governments-according-to-new-survey>>  
15. World Economic Forum. (2025). *The future of jobs report 2025*. World Economic Forum. <<https://www.weforum.org/publications/the-future-of-jobs-report-2025/>>



Chapter 2:

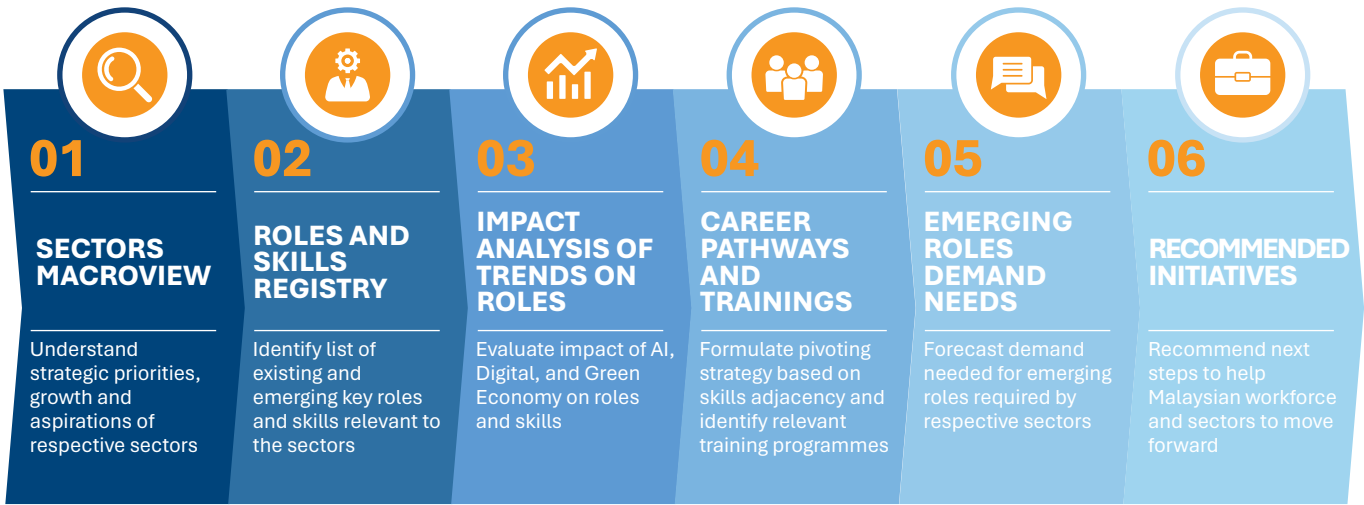
# Approach and Methodology

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# Approach

Phase 2 of the study adopts the same six-pronged approach as Phase 1, integrating qualitative and quantitative research techniques to generate insights and meet the study’s objectives. This structured methodology ensures that the study’s outcomes accurately reflect current industry dynamics while providing a forward-looking perspective on workforce trends over the next three (3) to five (5) years.



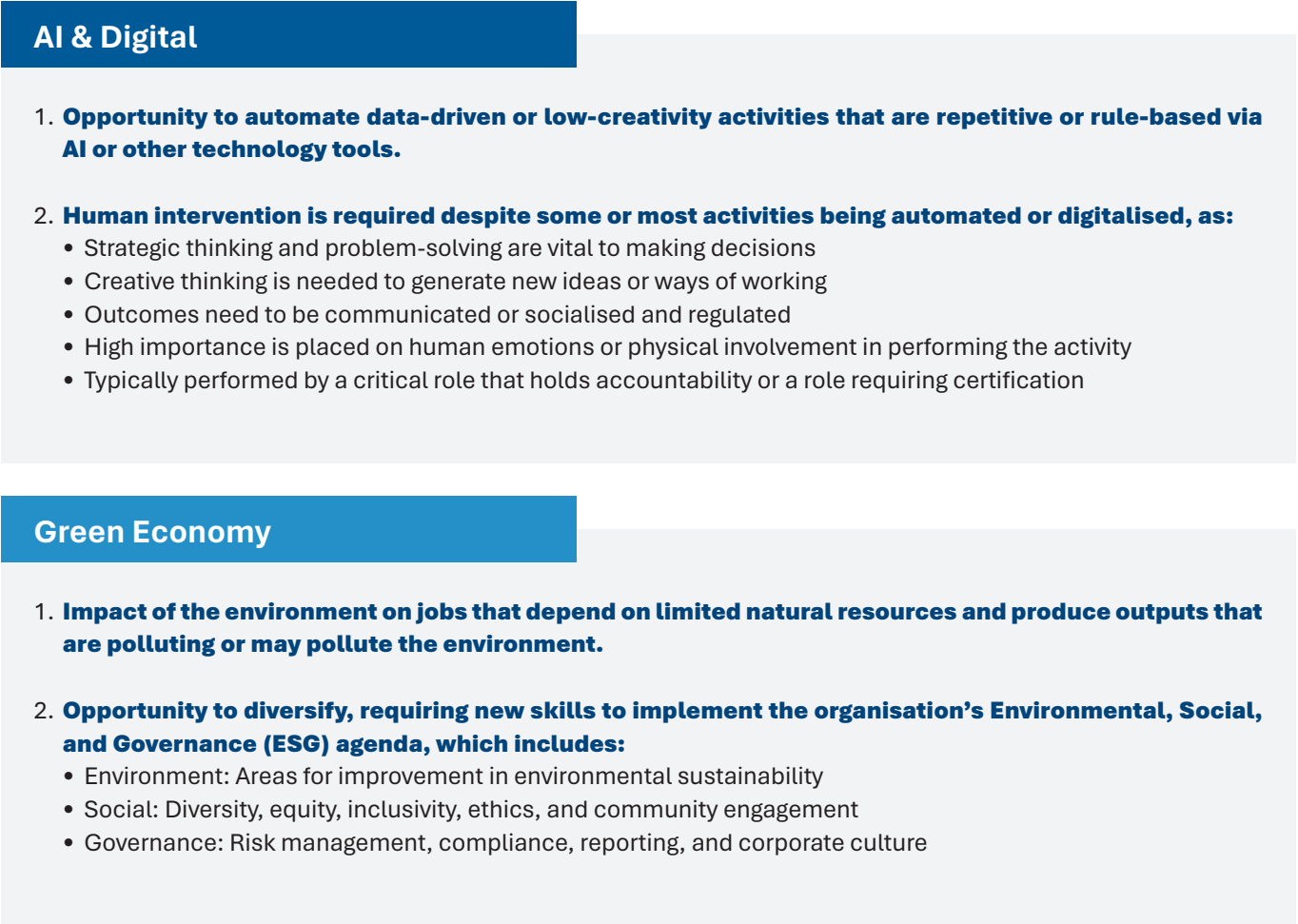
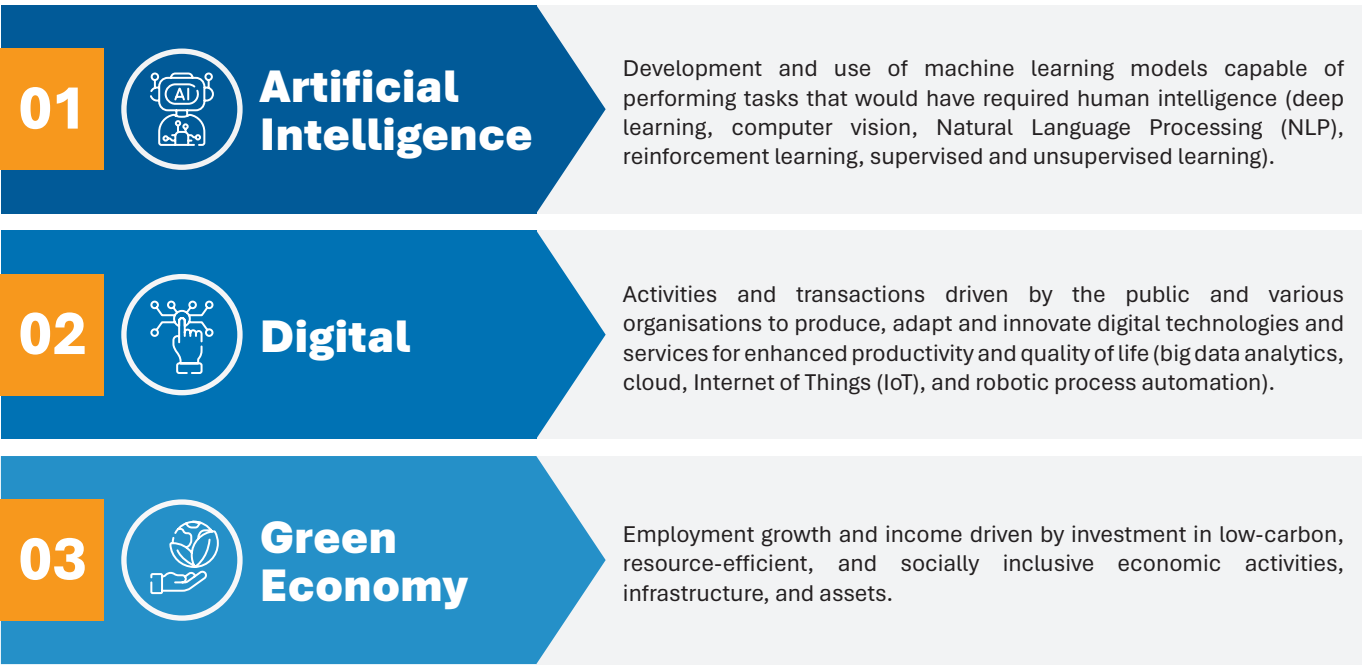
# Research Techniques

The research methodology incorporates a combination of qualitative and quantitative techniques, with enhancements in Phase 2 to strengthen demand forecasting. The techniques used include:



# Research Methodology

The study focuses on three (3) key trends shaping today’s workforce: AI, Digital, and Green Economy. Their definition is outlined below:





Based on the parameters above, the impact assessment of AI, Digital, and Green Economy on roles will result in one of the following outcomes:

**HIGH**  
**Roles at risk of convergence or displacement**  
  
Need to pivot to adjacent role and reskill

**MEDIUM**  
**Roles still relevant**  
  
Need to evolve and upskill to deliver beyond what would traditionally be expected

**LOW**  
**Roles not severely impacted**  
  
Require ongoing self-improvement to stay relevant

The impact assessment results inform individuals and organisations about the levels of risk faced by job roles in the sector. This information can aid in strategising career development and workforce planning, ensuring relevance amidst advancements in the three (3) key trends.

## Key Stakeholders Engaged in the Study

Engaging the right stakeholders is crucial to ensuring diverse perspectives and industry expertise are incorporated into the study. The selection of stakeholders follows four (4) key criteria:

**01**  
**HOLISTIC SECTOR COVERAGE**  
  
Ensuring **comprehensive industry representation** across **all sub-sectors** and the **entire value chain**.

**02**  
**STRONG BRAND PRESENCE**  
  
Engaging organisations with **high visibility and influence** within their respective sectors.

**03**  
**SIZEABLE EMPLOYMENT COVERAGE**  
  
Including firms with comprehensive coverage and employee counts across all roles included in the assessment.

**04**  
**SIGNIFICANT TURNOVER**  
  
Ensuring a **diverse mix** of industry players, including **large firms with high revenue and workforce turnover**.

### Key Facts and Figures from Stakeholder Engagements

#### Telecommunications sector

A total of **15** industry players were engaged across **6** organised sessions, gathering insights from **~30** stakeholders

| Industry Players Engaged                                                                                                                                                                                    | Number of Engagements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><b>15</b> Industry Players</div> <div>Examples of organisations engaged<br/>Non-exhaustive list</div> <div></div> | <div><b>6</b> Workshops, 1-1 Meetings, In-Depth Interviews</div> <div> <b>Senior Leadership interviews</b> conducted</div> <div> <b>Input from C-Suites</b><br/>COOs, CHROs, CSOs, CTOs, Head of Sustainability, etc.</div> <div> <b>~30 stakeholders</b><br/>engaged during workshop and/or 1-1 engagement</div> |



Key Facts and Figures from Stakeholder Engagements

Broadcasting sector

A total of **11** industry players were engaged across **6** organised sessions, gathering insights from **~30** stakeholders

| Industry Players Engaged | Number of Engagements |
|--------------------------|-----------------------|
|--------------------------|-----------------------|

11 Industry Players

Examples of organisations engaged  
Non-exhaustive list



6 Workshops, 1-1 Meetings, In-Depth Interviews

Senior Leadership interviews conducted

Input from C-Suites  
COOs, CHROs, CSOs, CTOs, Head of Sustainability, etc.

~22 stakeholders engaged during workshop and/ or 1-1 engagement

Key Facts and Figures from Stakeholder Engagements

Postal and Courier sector

A total of **13** industry players were engaged across **5** organised sessions, gathering insights from **~30** stakeholders

| Industry Players Engaged | Number of Engagements |
|--------------------------|-----------------------|
|--------------------------|-----------------------|

13 Industry Players

Examples of organisations engaged  
Non-exhaustive list



5 Workshops, 1-1 Meetings, In-Depth Interviews

Senior Leadership interviews conducted

Input from C-Suites  
COOs, CHROs, CSOs, CTOs, Head of Sustainability, etc.

~30 stakeholders engaged during workshop and/ or 1-1 engagement





# Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Phase 2, Volume 2

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Sector:  
**Communications  
& Multimedia:  
Telecommunications**

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# Chapter 3.1: Sector Overview

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# Overview of Global Trends in the Telecommunications Sector

The global COVID-19 in 2020 had a massive impact on the Telecommunications sector. Operations were disrupted and infrastructure projects were delayed, resulting in a sharp downturn for the sector from early 2020. The Telecommunications sector played an essential role in keeping people connected through the pandemic and the sector swiftly began recovering by 2021. Leading this recovery are the Asia Pacific and Latin America regions, driven by investments in fibre optics, 5G, and digital platforms. However, by 2023 – 2024, a divergence had emerged as the Asia Pacific continued to grow steadily while the European and Latin American regions plateaued and the United States of America (U.S.) lagged, mirroring the impact of differing levels of technology adoption, policy supports, and infrastructure upgrades across the regions.<sup>16</sup>

Strategic network modernisation, rural connectivity expansion, and aggressive 5G deployment programmes have accelerated the Asia Pacific region’s progress and recovery in the Telecommunications sector. The Asian region continues to push forward as other regions face operational challenges due to ageing infrastructure, cybersecurity gaps or policy inertia. It is worth noting that LEO (Low Earth Orbit) satellite integration and cloud-native network operations are now key components to bridging connectivity divide and improving service reliability, playing important roles in national digital sovereignty strategies.<sup>17</sup>



The chart underscores a strong correlation between Telecommunications sector performance, technology adoption, and strategic investment. Regions that lead in innovation and capacity building consistently demonstrate greater resilience and long-term growth potential. Looking ahead, the sector’s trajectory will hinge on the effective integration of advanced technologies, the expansion of inclusive connectivity, and the agility to adapt in an increasingly digital and competitive landscape.

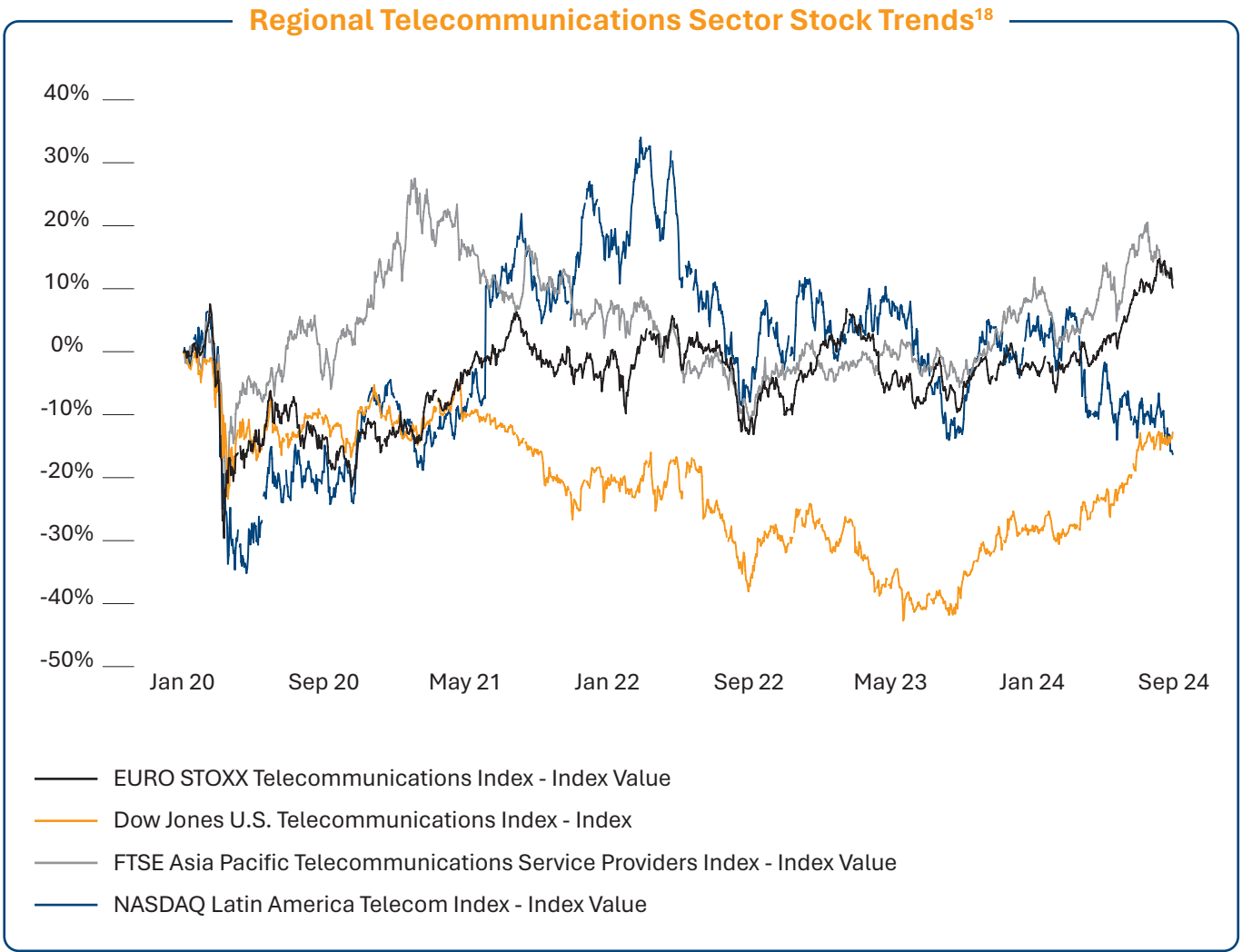
The region is spearheading the global shift from 3G to 5G, with countries progressing at differing speeds. Leading the pack are China, Japan, and South Korea, who have already decommissioned 3G and achieved nationwide 5G coverage. India has launched commercial 5G in major cities and is scaling nationwide, while Malaysia is strengthening 4G networks as a foundation for 5G through initiatives like JENDELA. Lower income nations remain in transition, maintaining 3G in rural areas while piloting 5G in urban zones.

## Insights on Asia’s Telecommunications Sector

Asia’s Telecommunications sector is undergoing a transformative shift – positioning the region as both a global leader in innovation and a critical frontier for inclusive connectivity. The region’s telecommunications landscape is highly dynamic, featuring a diverse mix of wired, wireless, and satellite infrastructures. In urban centres, especially in countries such as China, Japan, Singapore, and South Korea, fibre optic networks have seen rapid expansion, enabling ultra-fast broadband services. Wireless infrastructure, anchored by widespread 4G and the rapid expansion of 5G, has become the dominant method of connectivity in most countries. It delivers broad mobile internet access and is especially critical in regions where fibre deployment is prohibitively costly or technically challenging. Additionally, satellite connectivity, driven by LEO satellite solutions is gaining momentum, particularly in extending coverage to remote and island communications across Indonesia, Philippines, and part of Central Asia. By complementing terrestrial networks, these technologies help bridge persistent connectivity gaps and support more inclusive digital participation.

Despite rapid progress, challenges persist. The pace of these transitions mirrors the disparities that exist within the region. Infrastructure gaps between urban areas and underserved rural regions remain significant. High deployment costs for fibre and 5G towers, regulatory and spectrum bottlenecks, and rising cybersecurity and data privacy risks all constrain technological progress in parts of the region. Additionally, skills shortages in managing next-generation networks and cloud-native infrastructure hinders full-scale transformation.<sup>19</sup>

Yet, the opportunities are equally vast. Asia’s young, tech-savvy population fuels strong demands for mobile-first services and digital platforms. The expansion of 5G and LEO satellite networks is unlocking potential for smart cities, autonomous transport, telemedicine, and industrial IoT. National digital agendas such as Malaysia’s JENDELA, China’s Digital Silk Road, and India’s Digital India, coupled with regional cooperation and public-private partnerships, offer fertile ground for accelerating investment, affordability, and inclusion in the Asia region. With these drivers, Asia’s Telecommunications sector is well-positioned to shape the future of the global digital economy.<sup>20</sup>



Note: Data as of 10 December 2024

16. GSMA, Ericsson, & Statista. (2024). The Global Telecommunications Sector: 2020–2024 Performance and Asia-Pacific Outlook  
17. Ibid  
18. Capital IQ, EY Insights Analysis

19. International Data Corporation (IDC). (2023). Worldwide Telecom Services Tracker 2023. IDC.  
20. Counterpoint Research. (n.d.). Asia 5G and IoT Market Reports. Counterpoint Research.



# Overview of Malaysian Trends in the Telecommunications Sector

Malaysia’s Telecommunications sector stands as a vital enabler of national development and digital transformation. This mature and highly regulated sector is governed by the Malaysian Communications and Multimedia Commission (MCMC). The Commission plays a central role in enforcing government policies, promoting fair competition, and safeguarding consumer rights.

Characterised by strong competition among key players such as Telekom Malaysia, Maxis, CelcomDigi, and U Mobile, the sector delivers a full suite of services including fixed-line, mobile, broadband, and enterprise solutions while continuously expanding nationwide coverage. Concurrently, significant national efforts are underway to expand digital connectivity and accelerate 5G deployment, ensuring Malaysia remains regionally competitive and globally relevant to meet the demands of a future digital economy.

## A Snapshot of the Telecommunications Sector in Malaysia

GDP Contribution<sup>21</sup>  
**RM73.16 billion** 2023e  
or 4% of total GDP

### Sub Sector

**Infrastructure:**  
Physical and digital systems such as towers, fibre-optic cables, data centres, satellite equipment, and network equipment that enable the transmission of voice, data, and video across communication networks

**Services:**  
Full range solutions including connectivity, infrastructure, platforms, security, and support for seamless digital communication

**Customer:**  
An individual or organisation that uses communication services such as voice, data, internet, and digital solutions provided by telecommunications operators

**Support:**  
A network of procedures and structure that ensures the company operates within the legal and regulatory frameworks established by government authorities and sector regulators

|                                                                                |                                                                                      |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Number of Employees <sup>22</sup><br><b>286,300</b><br>(ICT sector as a whole) | Number of Licensees <sup>23</sup><br><b>573</b> 2024<br>(Inclusive of NFP, NSP, ASP) |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

Malaysia’s 5G rollout has emerged as one of the most advanced in the region, achieving approximately 92% population coverage as of Q3 2024. The network is underpinned by fibre-optic backhaul, Standalone 5G (SA), and Fixed Wireless Access (FWA), enabling high-speed, low-latency connectivity across urban centres and semi-rural areas. Notably, Malaysia’s 5G network incorporated advanced features such as millimetre-wave (mmWave), network slicing, and Reduced Capability (RedCap), supporting a wide range of enterprise and public-sector applications. Complementing

this is the fixed broadband services which has reached over 7.5 million premises and significantly increased gigabit-level access, driven primarily by fibre expansion under the JENDELA initiative. In remote and underserved regions, satellite connectivity, including MEASET’s ConnectMe Now and LEO satellite trials, is bridging Malaysia’s digital divide. Together, these efforts are laying the foundation for an inclusive, high-performance digital ecosystem.<sup>24</sup>

The transition from 3G and 4G to 5G has been swift and transformative. Through JENDELA, Malaysia successfully phased out 3G services, strengthened nationwide 4G, and accelerated 5G adoption. By early 2025, more than 56% of mobile users have adopted 5G, with median download speed increasing more than tenfold. This rapid uptake is enabling high-value applications in education, healthcare, mobility, and broadcasting, signalling a decisive leap forward in Malaysia’s digital capability.

However, despite strong progress, challenges that hinder full-scale 5G adoption remain. Infrastructure gaps in rural areas, high deployment costs, and extended return-on-investment (ROI) period serve as major barriers. Public awareness is still limited and many consumers lack 5G-ready devices. In parallel, cybersecurity frameworks and the integration of Micro, Small, and Medium Enterprises (MSMEs) into the 5G ecosystem remain underdeveloped, posing risks of delayed or uneven benefits across the economy.<sup>21</sup>

Realising the full potential of 5G will also depend on talent. Developing a workforce skilled in automation, advanced network architectures, and emerging digital applications is critical to advancing Malaysia’s digital economy. By investing in talent development, telecommunications companies can drive innovation, accelerate adaptability, and enhance customer satisfaction. This not only strengthens operational efficiency but also ensures Malaysia’s position as a regional leader in delivering cutting edge services to meet future demands.

## Alignment to National Agenda



JENDELA (Jalinan Digital Negara) is Malaysia’s flagship digital infrastructure initiative, launched in 2020 to enhance nationwide broadband coverage, strengthen 4G networks, phase out 3G, and prepare the country for 5G adoption. Closely aligned with the MyDIGITAL Blueprint and the MADANI aspirations, JENDELA has achieved significant milestones by 2025, including over 82% 5G population coverage, faster mobile internet speeds, and the expansion of fibre connectivity to millions of premises. These achievements have been instrumental in narrowing the digital divide, laying the groundwork for Malaysia’s digital economy.<sup>26</sup>

Building on this foundation, Malaysia is now transitioning into the post-JENDELA phase, which emphasises advanced connectivity and ecosystem development. National priorities include the rollout of 5G-Advanced (5G-A), expansion of smart city applications, deployment of private 5G networks for key sectors, and the strengthening of cybersecurity infrastructure. Complementary programmes such as 5G Innovation Labs, and the Enterprise Virtual Core Network (EVCN) are being introduced to accelerate business and public-sector adoption of next-generation technologies.

21.Department of Statistics Malaysia (DOSM)

22.Ibid

23.Malaysian Communications and Multimedia Commission (MCMC)

24.Mordor Intelligence. (2024). Malaysia Telecom Market Size & Share Analysis - Growth Trends and Forecast (2025–2030).

25.The Star. (2024, September 5). Outlook for telco segment remains positive. <<https://www.thestar.com.my/business/business-news/2024/09/05/outlook-for-telco-segment-remains-positive>>

26.JENDELA. <<https://myjendela.my/en-GB/>>



Opportunities and Challenges

Malaysia’s Telecommunications sector stands at a pivotal juncture, marked by significant opportunities driven by technological advancement and national digital initiatives, yet challenged by structural and market constraints. The rapid rollout of 5G, fibre expansion, and edge computing offers immense potential for enabling smart cities, enhancing connectivity in underserved regions, and creating new business-to-business (B2B) revenue streams through integrated solutions. However, the sector must concurrently navigate challenges such as high energy consumption, a shortage of skilled talent in emerging technologies, limited enterprise adoption of advanced services, and the financial pressures of green transition and network decarbonisation. Balancing innovation with sustainable growth while aligning with national goals like MyDIGITAL will be crucial for Malaysia to harness the full transformative potential of its telecommunications ecosystem.

Opportunities

- Emerging Opportunities in Malaysian Telecommunications**  
National fibre optic expansion is extending critical backhaul support and broadband access to underserved rural and semi-urban regions. The B2B segment offers significant revenue potential through integrated cloud-connectivity-security bundles for SMEs, manufacturing, education, and government sectors. The rollout of 5G enables transformative private networks and edge computing solutions for smart factories, ports, and campuses. Furthermore, cross-industry partnerships between telecommunications companies, fintech firms, and financial institutions are creating innovative financial inclusion models that leverage mobile connectivity and digital wallets to serve unbanked gig workers and rural communities.
- Leveraging Technology for Network Advancement**  
The shift toward AI-powered self-optimising networks (SON) is enhancing real-time traffic management and QoS, enabling predictive maintenance, and reducing operational costs through automation. Private 5G networks are unlocking new enterprise applications, supporting low-latency applications like smart city surveillance, autonomous systems, as well as AR/VR. The transition to software-defined network architecture is accelerating service rollouts through 5G network slicing, improving scalability and flexibility. Additionally, initiatives such as Putrajaya’s autonomous bus pilot, powered by 5G SA technology, demonstrate this evolution, featuring real-time surveillance, AI-driven safety systems, and seamless connectivity, highlighting technological impact on urban mobility while fostering public-private innovation.
- Telecommunications Capacity Development**  
Malaysia is proactively addressing critical skill shortages in 5G, AI, and cybersecurity through targeted capacity-building initiatives. Programmes such as the 5G & Beyond Academy, HRD Corp’s training vouchers, and CyberSecurity Malaysia’s certifications are aimed at developing sector-ready professionals. To complement this, educational alignment is being strengthened through 2U2I placements, FOIT certifications, and Malaysia Digital Economy Corporation’s (MDEC’s) adjunct faculty programme, providing TVET and university students with practical fibretelecommunications skills. Government initiatives including MyDIGITAL’s Cloud Track and DNB’s hackathons are cultivating hybrid talent in telecommunications-cloud-data science fields. Specialised training in fibre optics, wireless technologies, and satellite operations through partnerships with sector players and agencies ensures comprehensive domain-specific expertise development across all network technologies.
- Broadband Expansion as a Growth Catalyst**  
Surging data consumption and demand for high-speed internet continue to drive robust growth in broadband services. Providers are enhancing customer value and improving retention through bundled offerings that combine broadband with mobile and digital content. Significant expansion opportunities remain in underserved and semi-urban areas through fibre network deployment, while enterprise demand is rising alongside hyperscale data centre development. These opportunities are further reinforced by sustained government-led digitalisation initiatives that support long-term infrastructure investment and market expansion.

- Edge Computing**  
Malaysia’s telecommunications companies are uniquely positioned to leverage existing infrastructure for edge computing deployment. By processing data closer to the source, telecommunications companies can significantly reduce latency, enabling faster response times for critical applications and services. The increasing demands for IoT devices and data-intensive applications has created unprecedented demand for robust computing edge solutions. Offering edge computing services represents a substantial revenue opportunity, helping providers to attract new enterprise customers and retain existing clients through enhanced operational capabilities. This strategic positioning enables telecommunications companies to serve as key enablers of Malaysia’s digital economy, directly supporting national goals for advanced connectivity and comprehensive digitalisation.

Challenges

- Internal and External Barriers of Growth**  
The sector faces pressure to decarbonise energy-intensive network operations amid high electricity costs, complicating net-zero commitments. Low digital awareness and capability among industrial and SME sectors stifle demands for advanced telecommunications services such as 5G and smart factories. Additionally, the current stage of ecosystem readiness and the need for greater clarity on ROI remain key factors for stakeholders evaluating investment in enterprise 5G or private networks.
- Optimisation and Integration of Telecommunications**  
The optimisation of Malaysia’s telecommunications ecosystem is hindered by several critical gaps. Digitally expanding services such as IoT, fintech, and Healthtech escalate cybersecurity risks, yet national regulatory frameworks remain underdeveloped. Network fragmentation persists as fibre, mobile, and satellite infrastructures operate in silos, lacking interoperability, especially in rural areas. Compounding this challenge is the significant skills shortage in advanced fields like SDN/NFV, AI-driven optimisation, and satellite integration impeding technological cohesion. Additionally, slow adoption of energy-efficient practices and green-powered base stations limits both environmental and operational progress.
- Skill Gaps and Talent Shortage**  
The Malaysian Telecommunications sector faces a shortage of skilled professionals in emerging fields such as 5G, AI, cybersecurity, SDN/NFV, and satellite communications. This skills gap is exacerbated by TVET and university curricula that lag behind industry technological advancements, leaving a deficit of certified talent, especially for network automation engineers. Adding to the challenge is a growing need for multi-skilled professionals who can integrate telecommunications expertise with adjacent fields such data science and cloud engineering, highlighting an urgent demand for interdisciplinary capabilities that current training pipelines are not yet meeting.
- Intensifying Competition in Fixed Broadband**  
The fixed broadband market faces intensifying competition, severely pressuring profit margins for major operators. Stiff rivalry is compounded by regulatory caps on wholesale pricing, limiting revenue for resellers. With urban markets nearing saturation, acquiring new high-value customers has become difficult, forcing investment into lower-margin rural expansion. Despite solid operational performance, the absence of immediate growth catalysts is dampening investor enthusiasm for the sector in the short-term.



# Impact and Adoption of AI, Digital, and Green Economy on the Telecommunications Sector

A triple disruption – AI, Digital, and the Green Economy – is fundamentally reshaping the telecommunications landscape. This convergence is transforming telecommunications operators from mere connectivity providers into architects of intelligent, data-driven ecosystems, all while demanding a rapid shift towards sustainable and energy-efficient operations.

A

Artificial Intelligence

AI has emerged as a vital catalyst for transformation. Globally, AI is being widely adopted to drive operational efficiency and enhance customer experience. Mirroring this trend, Malaysia’s Telecommunications sector is taking strategic steps into the AI landscape, leveraging collaborations and partnerships to build the foundation for a more resilient and data-driven future.

## Global Trends<sup>27</sup>

1. Usage of Generative AI (GenAI)<sup>28,29</sup>
- GenAI is revolutionising the sector’s entire value chain, deploying intelligent solutions that are centred on enhancing customer experience and boost operational efficiency. From product optimisation and traffic forecasting to AI-powered chatbots, this transformation is already underway. According to NVIDIA’s research, 52% of industry players have deployed their first GenAI service or application, with 65% of them heralding significant gains in employee productivity and efficiency.
2. AI in Telecommunications Network Infrastructure<sup>30,31,32</sup>
- AI is now a cornerstone of strategic investment in telecommunications network infrastructure, with a sharp focus on Radio Access Network (RAN) to boost performance and efficiency. This priority is exemplified by major alliances in the sector such as the AI-RAN Alliance involving members from 17 countries and initiatives from sector players like Jio Platforms, AMD, Cisco, and Nokia, who are collaborating to develop an AI-powered Open Telecom Platform to transform operations.



Global Case Studies

verizon

Verizon is advancing its AI ecosystem through strategic collaborations to enhance operational efficiency and secure a competitive market position.<sup>33</sup>

27. EY Analysis

28. Verizon. (2025). Verizon unveils AI strategy to power next-gen AI demands. <<https://www.verizon.com/about/news/verizon-unveils-ai-strategy-power-next-gen-ai-demands>>

29. NVIDIA. (2024). State of AI in Telecommunications Report. <<https://resources.nvidia.com/en-us-ai-in-telco/telco-report-state-o?xs=582167>>

30. AI-RAN Alliance. Homepage. <<https://ai-ran.org>>

31. Advanced Micro Devices (AMD). (2025). Jio Platforms Limited along with AMD, Cisco and Nokia unveil AI-powered Open Telecom Platform. <<https://www.amd.com/en/newsroom/press-releases/2025-03-03-jio-platforms-limited-along-with-amd-cisco-and-nokia-unveil.html>>

32. Tech Wire Asia. (2025). Indosat becomes first mobile operator in SEA to roll out AI-RAN with Nokia and NVIDIA. <<https://techwireasia.com/2025/03/indosat-becomes-first-mobile-operator-in-sea-to-roll-out-ai-ran-with-nokia-and-nvidia/>>

33. Verizon. (2025). Verizon unveils AI strategy to power nex-gen AI demands. <<https://www.verizon.com/about/news/verizon-unveils-ai-strategy-power-next-gen-ai-demands>>



Vodafone has forged a strategic partnership with Microsoft to revolutionise its customer experience, deploying advanced AI chatbots to deliver personalised, multilingual customer service.<sup>34</sup>



Indosat is the first mobile operator in South East Asia to deploy AI-RAN technology, a strategic move to enhance network performance, efficiency, and service capabilities.<sup>35</sup>



Nokia is collaborating with key sector leaders including NVIDIA, SoftBank, and T-Mobile, to spearhead the integration of AI into next-generation network operations.<sup>36</sup>



34. Insights provided by Maxis Berhad

35. Ibid

36. Ibid



Malaysian Trends

The adoption of AI within Malaysia’s Telecommunications sector currently stands at a medium stage of maturity. While some leading companies are actively integrating AI, others remain in early phases of exploration and collaboration. Significant growth is anticipated over the next three (3) to five (5) years, bolstered by strong industry encouragement to accelerate the adoption of GenAI.<sup>37</sup> These initiatives are viewed as essential to optimising operations and driving sustained progress across the sector.

Several prominent initiatives can be seen across the sector, mirroring the wider global trends in telecommunications:



Maxis’ Mia (Maxis Intelligent Assistant)<sup>37</sup>

- A GenAI-powered concierge service tailored for business customers
- Integrated into the Maxis Business Hub (MBH) digital service portal
- Enhance and streamline the customer experience
- Allow users to easily access information and carry out tasks related to their accounts and services through conversational interactions, delivering a faster, more intuitive way to manage their business needs



Maxis and Amazon Web Services (AWS)<sup>38</sup>

- Centres on driving GenAI innovation and 5G applications tailored for Malaysian enterprise customers
- Focuses on applications in practical business scenarios across sectors such as retail, manufacturing, logistics, and financial services
- Elevates customer service and support capabilities, empowering enterprises to make quicker, more impactful, and informed business decisions



CelcomDigi and SK Telecom MoU<sup>39</sup>

- Memorandum of Understanding (MoU) on AI-driven initiatives and exchange of knowledge
  - Focus #1: AI case studies in Malaysia
  - Focus #2: Commercialising AI services
  - Focus #3: Exploring new AI business opportunities



CelcomDigi, Huawei Malaysia, and ZTE<sup>40</sup>

- Develop Malaysia’s future digital network by leveraging advanced AI and next-generation connectivity technologies
- Enhance digital experiences in Malaysia
- Support the nation’s transformation into a 5G- and AI-powered society



YTL Communications and Equinix Inc.<sup>41</sup>

- Introduce advanced technology solutions to businesses in Malaysia, focusing on improving connectivity and AI capabilities
- Drive Malaysia’s AI adoption and digital transformation by providing business



Bullish Aim Group (BA Group) and YTL Communications<sup>42</sup>

- A joint venture to develop next-generation common fibre infrastructure, aimed at meeting the growing demand for high-speed connectivity and reliable data services
- Involved the rollout of a unified fibre optic network to improve data transmission efficiency and support telecommunications operators and businesses
- Deployment has begun in Q1, covering major townships across Johor, including several underserved areas



Telekom Malaysia (TM)<sup>43</sup>

- Driven by the mission to accelerate and scale AI initiatives across the organisation while building critical experience and capabilities across key sectors such as manufacturing, utilities, and agriculture
- In manufacturing, AI-driven smart factory solutions are being developed by integrating IoT and data analytics to enable real-time monitoring and production line optimisation, enhancing operational efficiency and minimising downtime
- In the utilities sector, advanced pilot projects are underway using AI-powered predictive analytics to tackle non-revenue water (NRW) issues. These solutions leverage real-time anomaly detection and live dashboards to identify and track water losses proactively.

37.Maxis. (2025, March). Maxis simplifies customers’ experience with Gen AI-powered concierge for businesses. <<https://www.maxis.com.my/en/about-maxis/newsroom/2025/march/maxis-simplifies-customers-experience-with-gen-ai-powered-concierge-for-businesses/>>

38.Maxis. (2024, February). Maxis collaborates with Amazon Web Services to drive generative AI innovation and 5G use cases. <<https://www.maxis.com.my/en/about-maxis/newsroom/2024/february/maxis-collaborates-with-amazon-web-services-to-drive-generative-ai-innovation-and-5g-use-cases/>>

39.New Straits Times. (2024). CelcomDigi inks MoU with South Korea’s SK Telecom to collaborate on AI. <<https://www.nst.com.my/business/corporate/2024/09/1112917/celcomdigi-inks-mou-south-koreas-sk-telecom-collaborate-ai>>

40.CelcomDigi. (2024). CelcomDigi launches state-of-the-art AI Experience Centre. <<https://www.corporate.celcomdigi.com/news/celcomdigi-launches-state-of-the-art-ai-experience-centre>>

41.Digital News Asia. (2024). YTL Communications collaborates with Equinix and Transcelestial to bring global AI cloud capabilities to Malaysia. <<https://www.digitalnewsasia.com/business/ytl-communications-collaborates-equinix-and-transcelestial-bring-global-ai-cloud>>

42.New Straits Times. (2025,). YTL, BA Group to build fibre network in Johor for fast internet access. <<https://www.nst.com.my/business/corporate/2025/02/1179548/ytl-ba-group-build-fibre-network-johor-fast-internet-access>>

43.Telekom Malaysia Berhad. (2024). Annual Report 2024. <<https://tm.listedcompany.com/misc/ar/ar2024.pdf>>





Malaysian Case Studies



Maxis-Google Cloud Partnership on GenAI<sup>44</sup>

Maxis has expanded its strategic collaboration with Google Cloud to integrate cutting-edge GenAI solutions across its business. This deepened partnership is already transforming operations - it has enabled Maxis to adopt Duet AI for Developers to boost its internal operations capacity and pilot Gemini models on Vertex AI to deliver next-level improvements in customer service. This collaboration also democratises access to GenAI by extending GenAI learning opportunities through Maxis' community programmes such as eKelas and eKelas Usahawan.



Maxis-AWS Collaboration on GenAI and Cloud<sup>45</sup>

Maxis is leveraging its partnership with AWS to drive GenAI innovation and strengthen cloud services, capitalising on the new AWS infrastructure Region in Malaysia. As the first AWS Advanced Tier Services Partner telecommunications company partner in Malaysia, Maxis is uniquely equipped to assist businesses migrate to the cloud, which enables low-latency deployment of advanced applications such as AI and GenAI. Beyond cloud, Maxis and AWS jointly developed and launched Mia, a GenAI-powered business concierge that simplifies and enhances customer experience on the Maxis Business Hub (MBH).



Maxis' GPU-as-a-Service<sup>46</sup>

Conscious of the transformative impact of AI to the sector, Maxis introduced GPUaaS (Graphic Processing Unit-as-a-Service) as one of their new services, becoming the first Malaysian telecommunications companies to do so. Powered by NVIDIA GPUs, this service offers businesses on-demand access to high performance computing for AI workloads, with future plans to become among the first to offer next-gen AI processing capabilities. Maxis' GPUaaS enables businesses to accelerate development of GenAI and LLMs without the financial burden of developing its own hardware.

44. Insights provided by Maxis Berhad

45. Ibid

46. Ibid



Maxis-Huawei Collaboration on Intelligent Network and 5G-Advanced<sup>47</sup>

Maxis has entered a strategic partnership with Huawei to seamlessly integrate AI and machine learning into its network operations and establish a Joint Innovation Centre for 5G-Advanced. Through this collaboration, AI/ML is being used for service monitoring, automate network optimisation, and detect predictive issues to create an intelligent NOC. Meanwhile, the innovation centre serves as a dual-purpose hub, becoming not only the focal point for the development of 5G-Advanced tech such as mobile edge computing but also serves as an important hub for cultivating a skilled talent pipeline through its R&D activities, ensuring the company remains at the forefront of Malaysia's Telecommunications sector.



Maxis-Nokia Partnership for AI-Powered Data Centres<sup>48</sup>

Responding to growing adoption of AI and cloud technology, Maxis has strategically expanded its partnership with Nokia to deliver advanced, AI-powered data centre networking solutions to enterprises and hyperscalers. This partnership integrates Maxis' extensive connectivity with Nokia's AI-powered Data Centre Fabric, creating a solution that provides superior scalability, enhanced security, and intelligent automation for modern data centre environments. By optimising data centre operations for AI workloads, this initiative directly addresses the accelerating adoption of AI and cloud technologies, enabling enterprises to run complex, AI-driven applications with greater efficiency and performance, thereby positioning Maxis as a key enabler in Malaysia's evolving digital ecosystem.



Maxis -HPE's AI-Powered Networking Partnership<sup>49</sup>

Maxis has partnered with Hewlett Packard Enterprise (HPE) to deliver security-first, AI-powered networking solutions to Malaysian businesses. This collaboration leverages HPE Aruba Networking Centre with integrated AIOps to create self-optimising networks that autonomously identify and resolve issues before they impact operations. Beyond technological advancements, this partnership embeds robust security at its core with HPE Aruba's Zero Trust framework and AI capabilities for continuous device profiling and policy orchestration. This integrated approach ensures business networks are not only self-optimising but also inherently resilient against modern cyber threats.

47. Insights provided by Maxis Berhad

48. Ibid

49. Ibid





**Maxis-Singtel's 5G Orchestration Partnership<sup>50</sup>**

To accelerate the digital transformation for Malaysian enterprises, Maxis has partnered with Singtel to launch the nation's first all-in-one 5G orchestration platform. This integrated solution provides businesses with a unified platform to seamlessly manage and automate their 5G network services, application deployment, and edge computing resources. By simplifying the complexity of next-generation connectivity, the platform empowers enterprises to rapidly deploy and scale innovative use cases, from smart factories to immersive customer experiences, thereby driving greater operational agility and competitive advantage in the digital economy.



**Maxis-China Mobile International (CMI) 5G & AI Partnership<sup>51</sup>**

Maxis and CMI have signed a strategic MoU that aims to accelerate 5G initiatives and foster digital innovation across Malaysia and the broader region. This partnership combines Maxis' local infrastructure with CMI's vast international presence for joint research and development of projects, focusing on creating resilient private 5G networks, developing smart park solutions, and pioneering advancements in AI.

“

AI is being identified as a tool, not replacement. Human touch element is still essential

”

**Nurasyikin Rosni, TM Sustainability General Manager**

50. Insights provided by Maxis Berhad

51. Ibid



B

Digital

The global Telecommunications sector is being fundamentally reshaped by digitalisation, a transformative force driving network modernisation, the proliferation of 5G and cloud technologies, and a heightened focus on edge computing and cybersecurity. This worldwide shift towards intelligent, software-defined infrastructure is mirrored in Malaysia's concerted push towards modernising and expanding its digital infrastructure. The domestic sector is responding through strategic network expansion and technological partnerships, aware that this evolution is essential for enhancing national connectivity and fuelling economic growth. A paramount focus on cybersecurity underpins this entire digital shift, ensuring that advancements in speed and capability are matched with robust and resilient security frameworks.

### Global Trends

#### 1. Network Modernisation<sup>52</sup>

- The growing adoption of high-speed, low-latency applications, such as cloud hosting and videoconferencing is accelerating the need for advanced network infrastructure including 5G and fibre options. Governments worldwide are responding to this shift by prioritising ultra-fast broadband coverage to reduce digital divide. At the centre of this digital transformation is the emergence of Open RAN. It is playing a key role in modernising networks through a multi-vendor, disaggregated approach. This allows hardware and software to be separated, with open interfaces and virtualisation making it possible to host and manage network functions in the cloud. As a result, networks become more agile, scalable, and open to continuous innovation.

#### 2. 5G Rollout and Expansion<sup>53</sup>

- The rollout and expansion of 5G technology is a transformative force in the Telecommunications sector, redefining both network capacity and service efficiency. Beyond delivering ultra-fast speeds and low latency, 5G unlocks the potential for massive machine-type communications and seamless user experiences that were previously unattainable. For telecommunications operators, active investment in 5G is no longer optional but essential, as it enables the delivery of innovative services. Additionally, the technology supports the development of virtual networks for specific use cases, thereby unlocking new revenue streams and offering operators the flexibility to deliver customised solutions across diverse industries.

52. EY Analysis

53. Logic Fruit Technologies. (2023). 5G Impact on Telecom: A Comprehensive Analysis. <<https://www.logic-fruit.com/blog/wireless-communication/5g-impact-on-telecom/>>





3. Adoption of Cloud Technologies<sup>54</sup>

- The adoption of cloud technologies is a central force in the Telecommunications sector’s transformation, driving a shift away from traditional, hardware-centric business operations. It is the key driver for growth and scalability for the sector. By embracing cloud infrastructure, telecommunications operators are transforming their business models to function as both managed service providers (MSPs) and cloud service providers (CSPs). This strategic pivot allows them to move beyond connectivity offerings and deliver a diverse portfolio of digital services that cater to the evolving needs of customers.

4. Cybersecurity Priority<sup>55</sup>

- The widespread deployment of 5G networks, with their capacity to connect a massive number of devices, significantly expands the attack surface for cyber threats. This heightened connectivity increases vulnerability to cyber threats, particularly as 5G is expected to underpin vital sectors such as healthcare, transportation, and energy, where a cyberattack could have severe societal and economic consequences. Given the vast amount of data transmitted over 5G, ensuring the confidentiality and integrity of communications is paramount, necessitating the implementation of robust, multi-layered security measures, including advanced encryption, real-time threat detection, to protect against potential vulnerabilities.

5. AI Edge Computing<sup>56</sup>

- AI edge computing is emerging as an essential enabler of next-generation digital infrastructure, processing data closer to its source to minimise latency and boost efficiency. This capability is particularly vital for real-time applications in healthcare, manufacturing, and autonomous systems, and other latency-sensitive sectors. By localising data processing, edge platforms like Cowbell not only strengthen security but also reduce bandwidth consumption and operational costs, offering a more resilient alternative to centralised models. As the rollout of 5G and the proliferation of IoT devices generate unprecedented volumes of data, edge computing ensures seamless performance for critical functions such as smart city management and medical diagnostics, effectively reducing bottlenecks and enhancing reliability.

54.The Fast Mode. (2024). How Cloud Infrastructure Can Be Offered for Telcos. <<https://www.thefastmode.com/expert-opinion/38838-how-cloud-infrastructure-can-be-offered-for-telcos>>  
55.TÜV SÜD. (2023). The role of cybersecurity in 5G networks. <<https://www.tuvsud.com/en-za/resource-centre/blogs/the-role-of-cybersecurity-in-5g-networks>>  
56.The Fast Mode. (2024). The Evolution of Connectivity: Emerging Trends in Telecommunications. <<https://www.thefastmode.com/expert-opinion/39838-the-evolution-of-connectivity-emerging-trends-in-telecommunications>>



Global Case Studies



**Orange** is transitioning from a rigid infrastructure to a more flexible, software-driven network, anchored in five (5) key pillars of network modernisation.<sup>57</sup>

T Mobile

**T-Mobile** launched the world’s first standalone 5G network with carrier aggregation, delivering faster speeds, and specialised services.<sup>58</sup>



**Singtel** is deploying 5G+ on the 700MHz band to boost coverage and strengthen signals indoors and underground.<sup>59</sup>



**Telstra** adopted a cloud-based system digitise operations and streamline business processes.<sup>60</sup>



**BT Group** established a Future Cyber Defense team to pioneer advanced cybersecurity technologies and strategies.<sup>61</sup>



**Telefonica** is at the forefront of driving edge computing, leading the advancements in enabling real-time data processing with low latency and greater efficiency.<sup>62</sup>

57.Fierce Network. (2024). Orange's network modernization strategy - Jean-Louis Le Roux. <<https://www.fierce-network.com/sponsored/oranges-network-modernization-strategy-jean-louis-le-roux>>  
58.PC Magazine. (2025). T-Mobile Tech President: 'We're Taking 5G Advanced Nationwide' - MWC 2025. <<https://www.pcmag.com/news/t-mobile-tech-president-were-taking-5g-advanced-nationwide-mwc-2025>>  
59.Singtel. (2024). Singtel launches first deployment of 700MHz spectrum in Singapore. <<https://www.singtel.com/about-us/media-centre/news-releases/singtel-launches-first-deployment-of-spectrum-in-singapore>>  
60.The Fast Mode. (2024). How Cloud Infrastructure Can Be Offered for Telcos. <<https://www.thefastmode.com/expert-opinion/38838-how-cloud-infrastructure-can-be-offered-for-telcos>>  
61.BT Group. Cyber Security Research & Development. <<https://www.bt.com/about/bt/research-and-development/cyber-security>>  
62.Telefónica Tech. Hybrid Cloud Solutions. <<https://telefonicatech.com/en/solutions/hybrid-cloud>>



Malaysian Trends

Malaysia is undergoing a rapid and determined digital shift, making significant investments in its digital infrastructure as part of its national transformation strategy. Malaysia’s Telecommunications sector demonstrates a high state of digital adoption, marked by aggressive network expansion and strategic partnerships aimed at deploying cutting-edge technologies. This concerted push is fundamentally enhancing telecommunications networks and embracing next-generation technologies like 5G, with the dual aim of improving nationwide broadband connectivity and bridging the digital divide. These efforts are not merely about connectivity; they are a critical national strategy to secure sustainable economic growth and technological competitiveness.

1. Network Expansions and Partnerships<sup>63,64,65</sup>

- Malaysia's network expansion is a government and industry-wide priority, accelerating 5G coverage and performance through strategic infrastructure investments and public-private partnerships to achieve nationwide digital inclusivity.
- **Digital Nasional Berhad (DNB)** is spearheading Malaysia’s 5G rollout, transforming national telecommunications infrastructure through accelerated deployment driven by strong public-private collaboration.
- **CelcomDigi’s** nationwide network modernisation is delivering measurable results for customers, boosting customer download speeds by 20-26% and enhancing signal strength by 13-16%.
- **U Mobile**, in strategic partnership with **Huawei Technologies** and **ZTE Corporation**, is deploying Malaysia’s next-generation 5G network using a dual network model. Their goal is to cover 80% of populated areas within 12 months, and for 90% the following year.
- **Telekom Malaysia (TM)** has redefined smart city connectivity with the deployment of its Distributed Radio Access Network (D-RAN) in Putrajaya. This infrastructure has enhanced 5G coverage to over 97%, with consistent speeds exceeding 100Mbps, enabling seamless digital experiences for both residents and businesses.

2. Advance Technology<sup>66,67,68</sup>

- Beyond 5G, Malaysia's Telecommunications sector is aggressively deploying advanced technologies like cloud-native platforms, edge computing, and multi-cloud integration to fundamentally enhance operational agility, unlock new enterprise solutions, and drive unprecedented business efficiency.
- **Tune Talk** has partnered with **Mavenir** to implement a cutting-edge Cloud-Native Digital Operations Support System (OSS) and Business Support System (BSS) platform which is designed to enable automated scaling and self-healing mechanisms to significantly enhance operational efficiency and resilience.
- **Maxis** has collaborated with **Singtel** to launch Malaysia’s first integrated platform that combines 5G networks, edge computing, cloud services, and service orchestration, leveraging Singtel’s Paragon platform for telecommunications. It aims to empower enterprises in key sectors such as manufacturing, logistics, healthcare, and public services with accessible digital transformation tools.



- **SEAX** and **EDOTCO** forged a partnership to advance fibre optic infrastructure and edge computing solutions throughout Malaysia developing cost-efficient fibre networks to support SEAX’s operations and upgrading EDITCO’s tower sites into advanced edge data centres. This collaboration is a response to the rising demands of 5G and data-heavy applications, with the aim to provide scalable, high-speed connectivity that links edge sites to SEAX’ regional hubs. By minimising latency and improving use experiences, this collaboration is vital for enabling smarter, data-driven solutions for industries and consumers nationwide.

3. Cybersecurity<sup>69,70,71</sup>

- As digital infrastructure expands, robust cybersecurity is vital. Malaysia is proactively establishing a rigorous regulatory framework and strategic public-private partnerships to fortify its national critical assets and build resilient, secure telecommunications networks.
- **Cyber Security Act 2024**, enacted by National Cyber Security Agency (NACSA), establishes mandatory obligations to protect Malaysia’s National Critical Information Infrastructure (NCII) and its entities from cyber threats, regulates cybersecurity service providers (CSSPs), and enhances national resilience through stringent governance and enforcement.
- **MCMC** has introduced guidelines on Information and Network Security guidelines for Communication and Multimedia Industry in order to boost service providers’ ability to mitigate cyber risks, minimise disruptions, prevent data breaches, and safeguard consumers through stronger network infrastructure.
- **Digital Nasional Berhad (DNB)**, in collaboration with CyberSecurity Malaysia (CSM), is developing comprehensive 5G security guidelines and establishing a National 5G Cybersecurity Testing Centre for vulnerability assessments and protocol verification, setting a benchmark for future 5G security protocols.

63. Telecom Review Asia. (2024). Malaysia's digital transformation powered by new technologies. <<https://www.telecomreviewasia.com/news/featured-articles/4001-malaysia-s-digital-transformation-powered-by-new-technologies/>>

64. Tech in Asia. (2024). Malaysia's U Mobile partners Huawei for 5G rollout. <<https://www.techinasia.com/news/malaysias-mobile-partners-huawei-5g-rollout>>

65. Asian Telecom. (2024). Telekom Malaysia Berhad (TM): Leading the way in digital transformation and connectivity excellence. <<https://asiantelecom.com/co-written-partner/event-news/telekom-malaysia-berhad-tm-leading-way-in-digital-transformation-and-connectivity-excellence>>

66. Mavenir. (2024). Tune Talk and Mavenir partner to revolutionise Malaysia's telco landscape with cloud-native digital OSS/BSS platform. <<https://www.mavenir.com/press-releases/tune-talk-and-mavenir-partner-to-revolutionize-malaysias-telco-landscape-with-cloud-native-digital-oss-bss-platform/>>

67. Maxis. (2024, August 14). Maxis partners Singtel to accelerate enterprise digital transformation with Malaysia's first 5G. <<https://www.maxis.com.my/en/about-maxis/newsroom/2024/august/maxis-partners-singtel-to-accelerate-enterprise-digital-transformation-with-malaysias-first-5g/>>

68. SEAX. (2024). SEAX and edotco join forces to advance Malaysia's digital connectivity through fibre and edge infrastructure. <<https://seax.net/seax-and-edotco-join-forces-to-advance-malaysias-digital-connectivity-through-fibre-and-edge-infrastructure/>>

69. The Sun Daily. (2024). MCMC introduces guidelines on information and network security to strengthen cybersecurity. <<https://thesun.my/malaysia-news/mcmc-introduces-guidelines-on-information-and-network-security-to-strengthen-cybersecurity-OI13397108>>

70. Telecom Review Asia. (2024). Digital Nasional Berhad, CyberSecurity Malaysia join forces to safeguard 5G networks. <<https://www.telecomreviewasia.com/news/service-news/4434-digital-nasional-berhad-cybersecurity-malaysia-join-forces-to-safeguard-5g-networks/>>

71. Attorney General's Chambers of Malaysia. (2024). CyberSecurity Act 2024 (Act 854). <<https://lom.agc.gov.my/act-detail.php?language=BI&act=854>>



C

Green Economy

Globally, the Telecommunications sector is increasingly prioritising sustainability, actively transitioning towards green networks powered by renewable energy and embracing circular economy principles to minimise environmental impact. This strategic shift is driven by the dual imperatives of reducing operational carbon footprints and meeting rising stakeholder expectations for corporate responsibility. Mirroring this international momentum, Malaysia’s Telecommunications sector is also beginning to align with these goals, though it faces distinct challenges on its pathway to a greener, more sustainable future.

Global Trends

1. Green Network<sup>72,73</sup>

- A green network is a communications infrastructure designed, built, and operated to minimise environmental impact by reducing energy consumption and carbon emissions. This can be achieved through several strategies: implementing energy-efficient infrastructure across all network layers, adopting a holistic lifecycle management approach that balances equipment rationalisation with environmental impact from decommissioning, and transitioning network power sources to renewable energy.

2. Circular Economy<sup>74</sup>

- The circular economy model business model for the Telecommunications sector is centres on reusing, refurbishing, recycling, and extending the lifespan of devices and network equipment to minimise waste and environmental impact. Operators are embracing this approach not only for its ecological benefits but also for its compelling financial advantages. Reselling decommissioned assets from network upgrades creates new revenue streams while sourcing pre-owned components helps to extend the viability of existing infrastructure, thus delaying costly new investments and reducing Scope 3 emissions. Circular practices align cost efficiency with sustainability, enabling it to become an integral part of modern telecommunications operations.



Global Case Studies



**EDOTCO** has deployed bamboo telecommunications towers across Bangladesh, Myanmar, and Cambodia, a pioneering move for sustainable infrastructure. This initiative is part of its efforts to develop eco-friendly alternatives to traditional materials, minimising the environmental footprint of network expansion.<sup>75</sup>



**Vodafone** achieved a major milestone by powering its entire European operations with 100% renewable sources. This is an essential step toward the company’s goal of reducing its carbon emissions and leading the sector in sustainable energy use.<sup>76</sup>

72. STL Partners. (2024). Green mobile networks: How operators are reducing environmental impact. <<https://stlpartners.com/articles/sustainability/green-mobile-networks/>>

73. Yahoo Finance. (2024). Globe joins international telecom leaders in climate action pledge. <<https://sg.finance.yahoo.com/news/globe-joins-international-telecom-leaders-003000012.html>>

74. Data Center Dynamics. (2024). Closing the loop: Telecoms' shift to a fully circular economy. <<https://www.datacenterdynamics.com/en/opinions/closing-the-loop-telecoms-shift-to-a-fully-circular-economy/>>.

75. Inside Towers. (2019). Edotco deploys 3,000 towers across Indochina, 15 made of bamboo <<https://insidetowers.com/cell-tower-news-edotco-deploys-30000-towers-across-indochina-15-made-of-bamboo/>>

76. Vodafone. (2024). Vodafone powers its entire European operations with 100% renewable electricity. <<https://www.vodafone.com/news/technology-news/100percent-renewables>>

**KDDI** recycled over 99% of its disused network hardware, demonstrating its commitment to the circular economy. This exceptional rate highlights a deeply integrated operational model where resource efficiency and waste reduction are integral parts of operations.<sup>77</sup>

**BT Group** has committed to adopting a circular approach across its operations and beyond. This strategic move is focused on designing out waste and increasing opportunities for repairing, refurbishing, and recycling products throughout its value chain.<sup>78</sup>

Malaysian Trends

Malaysia is steadily advancing its commitment to a Green Economy, aligning its Telecommunications sector with both national sustainability goals and global environmental objectives. Yet, the current state of adoption within the sector remains low. This lag is increasingly consequential, as the rollout of 5G networks requires up to three (3) times more energy than its 4G predecessors. Effective energy management has emerged as an essential but underdeveloped priority. However, it is evident that the Green Economy imperative is quietly reshaping fundamental operational strategies within Malaysia’s Telecommunications sector as more Telecommunications sector players adopt strategic shifts towards decarbonisation and energy as well as operational efficiency to ensure technological progress aligns with environmental responsibility.

Several prominent initiatives can be seen across the sector, mirroring the wider global trends in telecommunications:



Telekom Malaysia (TM)<sup>79</sup>

- Invested in low-carbon technologies, embraced renewable energy solutions, and supported carbon offset initiatives.
- Embedded responsible waste management practices to minimise waste generation, including waste segregation at EMS sites for both solid and scheduled waste.

77. Telecom Review Asia. (2024). Asia-Pacific’s telecom sector pursues green revolution. <<https://www.telecomreviewasia.com/news/featured-articles/4700-asia-pacific-s-telecom-sector-pursues-green-revolution/>>

78. BT Group. Circular economy: Tackling climate change. <<https://www.bt.com/about/digital-impact-and-sustainability/tackling-climate-change>>

79. Telekom Malaysia. (2022). Our Sustainability Journey: Integrated Annual Report 2022. <[https://www.tm.com.my/iar2022/files/Our\\_Sustainability\\_Journey.pdf](https://www.tm.com.my/iar2022/files/Our_Sustainability_Journey.pdf)>





**Axiata<sup>80</sup>**

- Net zero company by 2050, in line with GSMA’s vision for the mobile sector.
- Axiata’s Net Zero Roadmap demonstrates the results of over a decade of progress in environmental management that began with the use of low-impact materials in telecommunications tower construction.
- Implemented E-Kunu, an initiative that established a locally and globally recognised disposal chain to ensure responsible recycling of mobile and electronic waste.



**EDOTCO<sup>81</sup>**

- Pledged commitment to enhancing Malaysia’s biodiversity since 2018 through plant and tree planting initiatives.
- Collaborated with Malaysia Meteorological Department (MetMalaysia) to retrofit three (3) telecommunications towers with climate monitoring systems to track greenhouse gases.
- Integrate renewable energy sources into its infrastructure via its Green Tower Initiative to minimise carbon footprint.
- Built four (4) bamboo telecommunications towers and deployed solar-powered sites to support Axiata’s sustainability effort.



**EdgePoint Towers<sup>82</sup>**

- Launched its first solar hybrid site, marking a major milestone in its renewable energy journey.
- Powers telecommunications equipment independently using a 5.9-kilowatt peak (kWp) photovoltaic energy and battery storage at its solar hybrid site.
- Reduce annual carbon emissions by approximately 78% at the hybrid site while maintaining uninterrupted connectivity for highway users.
- Plans to roll out additional full solar and hybrid sites nationwide by the end of 2025.



**Malaysian Case Studies**



**Maxis’ Operational Green Initiatives<sup>83</sup>**

Maxis is proactively integrating Green Economy principles into its core operations to reduce its carbon footprint through initiatives across its fleet and network infrastructure. Maxis became the first Malaysian telecommunications company to deploy EVs for field operations, supported by its own solar-powered charging infrastructure. Simultaneously, Maxis is enhancing network energy efficiency by using solar solutions at remote sites and implementing advanced technologies such as Centralised Self Organising Network (CSON) for intelligent power management. These strategic investments result in operational efficiencies, positioning Maxis for sustainable growth in an increasingly carbon-conscious economy.

**Expansion of Maxis’ Home Solar Solution<sup>84</sup>**

Maxis is strategically expanding its business portfolio and advancing national sustainability objectives through the expansion of Home Solar Solutions across Peninsular Malaysia. Maxis’ Home Solar Solution plays a direct role in making renewable energy more accessible to homeowners by offering an accessible subscription model with a low upfront payment of RM1,000 covering installation, maintenance, and system monitoring costs. This not only empowers consumers but also actively supports Malaysia’s National Energy Transition Roadmap (NETR), contributing to the national ambition of achieving 70% renewable energy installed capacity by 2050. This strategic move positions Maxis not just as the leading telecommunications provider, but as a key enabler in the nation’s Green Economy.

**Maxis’ Collaboration with Local Universities<sup>85</sup>**

To bridge the industry-academia gap of the sector, Maxis has partnered up with multiple local universities to deliver digital upskilling initiatives and technology exposure to students. This strategic effort includes key collaborations with institutions such as Universiti Teknologi MARA (UiTM), International Islamic University Malaysia (IIUM), Universiti Malaysia Terengganu (UMT), Universiti Tun Hussein Onn Malaysia (UTHM), and Universiti Malaysia Perlis (UNIMAP). This partnership focuses on comprehensive student development programmes, fostering essential knowledge exchange, and joint sustainability initiatives, to ensure our talent pipeline is future-ready.

**Maxis’ eKelas GenAI Workshops**

In collaboration with Malaysia’s Ministry of Education (MOE), Maxis launched eKelas GenAI workshops to equip students and teachers nationwide with essential future-ready GenAI skills. These comprehensive workshops are structured with two (2) dedicated tracks to ensure both students and educators receive targeted training to effectively leverage the power of GenAI. By combining Maxis’ industry expertise to design curriculum-aligned module design, the programme ensures participants achieve measurable learning outcomes.

80. Axiata Group. Advancing Green Economy. <<https://www.axiata.com/sustainability/advancing-green-economy>>

81. EDOTCO Group. EDOTCO: Hero of Malaysia Connectivity Infrastructure. <<https://edotcogroup.com/media/content-hubs/edotco-hero-of-malaysia-connectivity-infrastructure>>

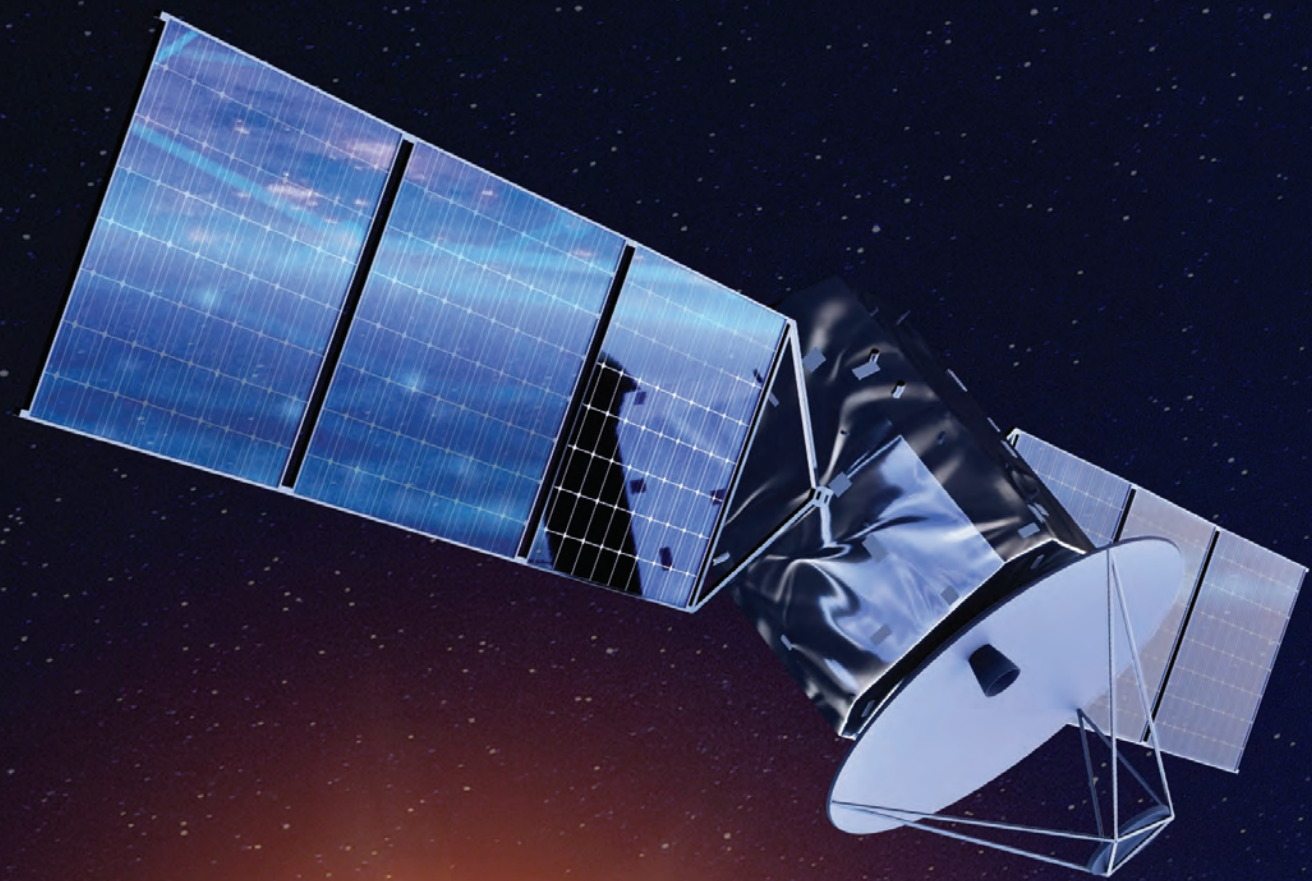
82. Developing Telecoms. (2024). EdgePoint Towers launches its first solar hybrid site. . <<https://developingtelecoms.com/telecom-technology/energy-sustainability/18393-edgepoint-towers-launches-its-first-solar-hybrid-site.html>>

83. Insights provided by Maxis Berhad

84. Ibid

85. Ibid





Chapter 3.2:

# Key Findings

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| Roles and Skills Analysis by Impact Level   | 78  |
| • Highly Impacted Roles and Career Pathways | 81  |
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# Overview of Roles and Skills



The convergence of AI, Digital, and Green Economy trends is reshaping the Telecommunications sector’s value chain, creating new opportunities while acknowledging urgent skills shortages. To fully understand the implications for the future workforce in the sector, it is essential to analyse its evolving value chain, including emerging segments and key job roles. This impact study identifies shifting career pathways and essential skills required for the workforce to successfully navigate the transition and support the sustainable growth of Malaysia’s Telecommunications sector.

| Segments                                                                                                                                                    | Job Clusters                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Infrastructure</b><br>Constitute both passive and active infrastructures including physical support systems and equipment that transmit and manage data. | <b>Access Network</b><br>Management of infrastructure and technology that enable efficient and reliable access network.               |
|                                                                                                                                                             | <b>Core Network</b><br>Management of foundational infrastructure essential for data and voice communication services.                 |
|                                                                                                                                                             | <b>Passive Infrastructure</b><br>Management of the physical components of telecommunications networks.                                |
|                                                                                                                                                             | <b>Facility Management</b><br>Responsible for the maintenance, safety, and efficient of physical facilities.                          |
|                                                                                                                                                             | <b>Transmission Network</b><br>Oversee the systems that enable reliable data transfer across telecommunications networks.             |
|                                                                                                                                                             | <b>Satellite Network</b><br>Management of the satellite systems delivering communication and data services across vast distances.     |
|                                                                                                                                                             | <b>Network Operations and Management</b><br>Ensure seamless connectivity and performance through effective management and automation. |

| Segments                                                                                                                                                                 | Job Clusters                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Services</b><br>Deliver comprehensive solutions including managed services, cybersecurity protection, and technical support to ensure secure and seamless operations. | <b>Cloud Network</b><br>Manage cloud-based solutions and services to ensure seamless integration with existing network infrastructures.                                    |
|                                                                                                                                                                          | <b>Data Services</b><br>Manage data assets and leverage advanced analytics to extract insights to facilitate informed decision-making.                                     |
|                                                                                                                                                                          | <b>Platform and Solution Services</b><br>Deliver a diverse range of integration services to ensure software and application reliability, performance, and user experience. |
|                                                                                                                                                                          | <b>Product Management</b><br>Oversee products and services to ensure alignment with market needs and drive innovation across various platforms.                            |
|                                                                                                                                                                          | <b>Security Services</b><br>Identify, manage, and mitigate cybersecurity threats to safeguard information systems and data.                                                |
| <b>Customer</b><br>Comprise of enterprises and end-user who use telecommunications services for their day-to-day activities.                                             | <b>Customer Services and Support</b><br>Enhance customer satisfaction and experience through effective service delivery, support, and insights.                            |
|                                                                                                                                                                          | <b>Marketing Management</b><br>Develop and execute marketing strategies across multiple channels to drive brand engagement and market growth.                              |
|                                                                                                                                                                          | <b>Sales Management</b><br>Cultivate client relationships and lead execution of sales strategies to maximise revenue cross distribution channels.                          |
| <b>Support</b><br>Regulatory and compliance functions within telecommunications sector to ensure companies operate in full alignment with government policies.           | <b>Regulatory and compliance</b><br>Ensure organisational adherence to telecommunications laws, regulations, and policies through proactive monitoring and governance.     |



Consolidated Job Clusters, Roles and Skills in the Telecommunications Sector

| 16 Job Clusters                                 |                                                   |                                       |                                                     |
|-------------------------------------------------|---------------------------------------------------|---------------------------------------|-----------------------------------------------------|
| Access Network<br>(9 job roles)                 | Cloud Network<br>(6 job roles)                    | Core Network<br>(3 job roles)         | Customer Services and Support<br>(6 job roles)      |
| Data Services<br>(2 job roles)                  | Facility Management<br>(9 job roles)              | Marketing Management<br>(7 job roles) | Network Operations and Management<br>(10 job roles) |
| Passive Infrastructures<br>(20 job roles)       | Platform and Solutions Services<br>(32 job roles) | Product Management<br>(9 job roles)   | Regulatory and Compliance<br>(5 job roles)          |
| Sales Management<br>(6 job roles)               | Satellite Network<br>(4 job roles)                | Security Services<br>(11 job roles)   | Transmission Network<br>(8 job roles)               |
| 147 Job Roles*<br>(*Including 3 Emerging Roles) |                                                   |                                       |                                                     |

| 25 Skills Clusters                                                           |                                                  |                                                             |                                                        |
|------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------|
| Categorised into 23 specific skill clusters and two (2) basic skill clusters |                                                  |                                                             |                                                        |
| Specific Skills                                                              |                                                  |                                                             |                                                        |
| Accounting and Finance<br>(4 skills)                                         | Agile and Continuous Improvement<br>(2 skills)   | Branding, Sales, and Marketing<br>(13 skills)               | Business Development and Strategy<br>(10 skills)       |
| Business Operation and Management<br>(10 skills)                             | Customer Service and Experience<br>(7 skills)    | Customer, Vendor, and Stakeholder Management<br>(10 skills) | Data Development and Implementation<br>(17 skills)     |
| Engineering and Maintenance<br>(27 skills)                                   | General Business Management<br>(9 skills)        | Health, Safety and Environment (HSE)<br>(22 skills)         | Legal and Regulatory<br>(2 skills)                     |
| Manufacturing and Production<br>(3 skills)                                   | Products and Services<br>(14 skills)             | People Management and Development<br>(1 skill)              | Project and Process Management<br>(12 skills)          |
| Quality Management<br>(13 skills)                                            | Research and Development<br>(5 skills)           | Risk Management, Compliance, and Governance<br>(39 skills)  | Software Development and Implementation<br>(51 skills) |
| Supply Chain and Logistics Management<br>(1 skill)                           | Technical Design and Architecture<br>(27 skills) | Technology Management<br>(27 skills)                        |                                                        |
| Basic Skills                                                                 |                                                  |                                                             |                                                        |
| Innovation and Delivery<br>(10 skills)                                       |                                                  | Social Intelligence<br>(6 skills)                           |                                                        |
| 342 Skills                                                                   |                                                  |                                                             |                                                        |
| Which comprises 326 Specific Skills and 16 Basic Skills                      |                                                  |                                                             |                                                        |

Consolidated Job Clusters and Roles in the Telecommunications Sector



16 job clusters and 147 roles, including emerging roles, have been identified for the Telecommunications sector.

| Job Clusters   | Roles                                                                                                                                       |                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Access Network | 1. 5G Systems Engineer<br>2. Access Network Design/Planner<br>3. Access Network Engineer<br>4. Access Network Technician<br>5. DAS Engineer | 6. Drive Tester<br>7. RAN / RF Manager<br>8. RAN Engineer<br>9. RF Engineer / RF Specialist |
| Cloud Network  | 1. Cloud Analyst<br>2. Cloud Architect<br>3. Cloud Developer<br>4. Cloud Engineer                                                           | 5. Cloud FinOps Engineer<br>6. Cloud Network Engineer / IT Network Engineer                 |
| Core Network   | 1. Core Network Architect<br>2. Core Network Engineer                                                                                       | 3. Core Network Manager                                                                     |



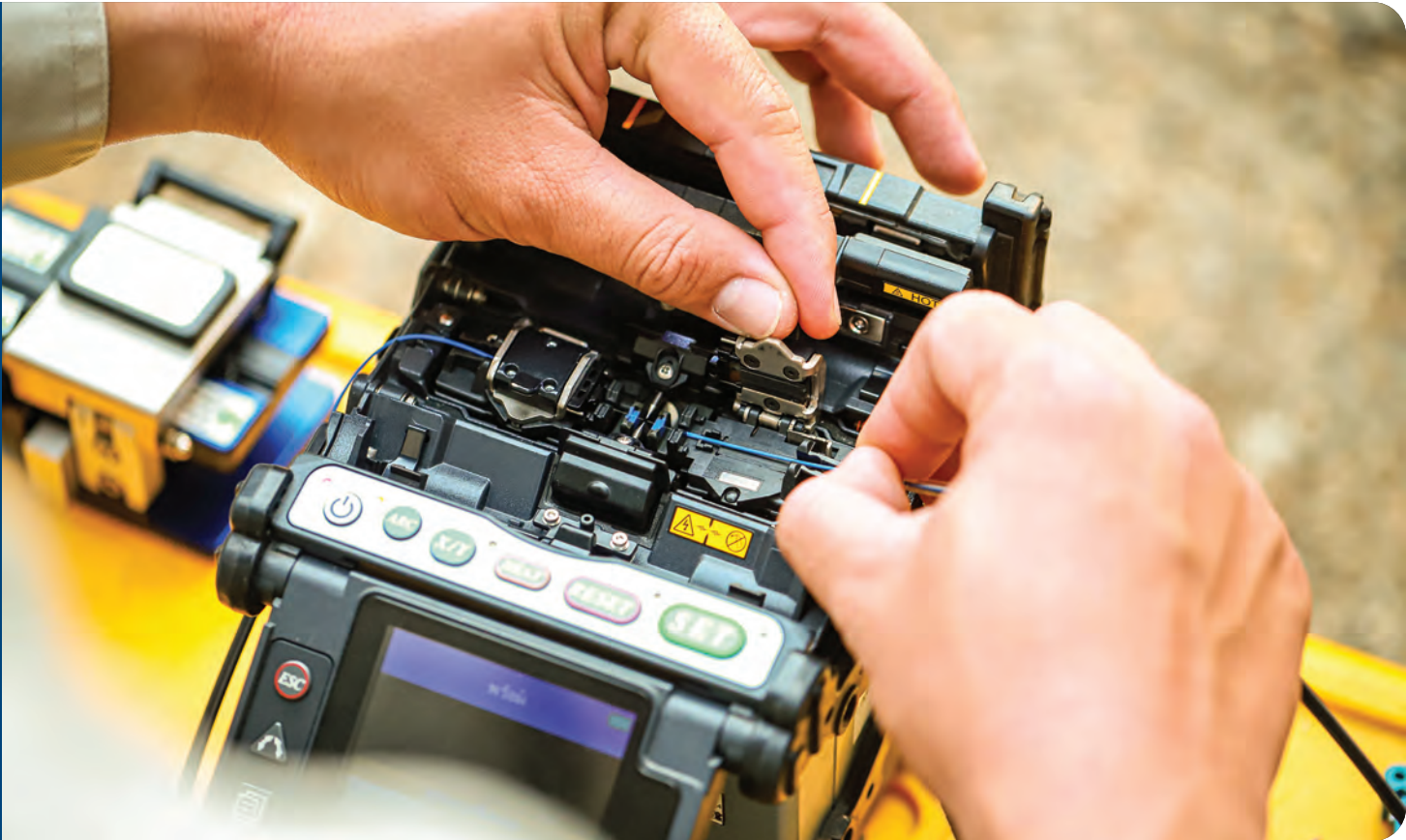
# Consolidated Job Clusters and Roles in the Telecommunications Sector (Continued)

| Job Clusters                      | Roles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Customer Services and Support     | <div><div>1. Customer and Market Insights Analyst</div><div>2. Customer Experience Manager</div><div>3. Customer Service Manager</div><div>4. Customer Service Representative</div></div> <div><div>5. Customer Support Engineer (Enterprise and Technical)</div><div>6. Customer Support Engineer (Mobile Services)</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
| Data Services                     | <div><div>1. Data Engineer</div><div>2. Data Scientist</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Facility Management               | <div><div>1. Chargemen</div><div>2. Energy Manager</div><div>3. Safety Officer</div><div>4. HVAC Engineer / Specialist</div><div>5. Facilities Technician</div></div> <div><div>6. Data Centre Architect</div><div>7. Data Centre Operations Engineer</div><div>8. Data Centre Network Engineer</div><div>9. Data Centre Security Specialist</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
| Marketing Management              | <div><div>1. Digital Marketing Executive</div><div>2. Digital Marketing Manager</div><div>3. Marketing Communication Specialist</div><div>4. Marketing Executive</div></div> <div><div>5. Marketing Manager</div><div>6. Product Marketing Executive</div><div>7. Product Marketing Manager</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
| Network Operations and Management | <div><div>1. Network Administrator</div><div>2. Network Analyst</div><div>3. Network Architect</div><div>4. Network Automation Engineer</div><div>5. Network Deployment Engineer</div></div> <div><div>6. Network Engineer</div><div>7. Network Manager</div><div>8. Network Tester / QA Engineer</div><div>9. NOC Engineer</div><div>10. NOC Manager</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Passive Infrastructure            | <div><div>1. Fibre Optic Engineer</div><div>2. Fibre Optic Network Manager</div><div>3. Fibre Optic Technician / Fibre Splicer / Cable Installer</div><div>4. Field Manager</div><div>5. Field Technician</div><div>6. Infrastructure Designer / Engineer</div><div>7. Infrastructure Operations Engineer</div><div>8. Infrastructure Project Manager / Construction Manager</div><div>9. Project Engineer</div><div>10. Site Access Executive</div></div> <div><div>11. Site Acquisition Specialist</div><div>12. Structure Engineer</div><div>13. Structure Manager</div><div>14. Telecommunications Fibre Director</div><div>15. Telecommunications Tower Director</div><div>16. Telecommunications Technician</div><div>17. Tower Crew Lead</div><div>18. Tower Maintenance Technician</div><div>19. Tower Operations Manager</div><div>20. Tower Technician / Tower Climber / Tower Installer</div></div> |  |

| Job Clusters                   | Roles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Platform and Solution Services | <div><div>1. Application Engineer</div><div>2. Applications Support Engineer</div><div>3. DevOps Engineer</div><div>4. DevSecOps Engineer</div><div>5. Embedded Systems Engineer</div><div>6. Embedded Systems Engineering Manager</div><div>7. Full Stack Developer</div><div>8. IoT Systems Engineer</div><div>9. Machine Learning Engineer</div><div>10. Site Reliability Engineer</div><div>11. Software Architect</div></div> <div><div>12. Software Engineer</div><div>13. Solution Architect</div><div>14. Solution Engineer / Pre-Sales Engineer</div><div>15. SysOps Engineer</div><div>16. System Engineer</div><div>17. System Support Engineer</div><div>18. Test Engineer / QA Engineer</div><div>19. UI Designer</div><div>20. Unified Communication (UC) Engineer</div><div>21. UX Designer</div></div> |  |
| Product Management             | <div><div>1. Cloud Product Manager</div><div>2. Data Product Manager</div><div>3. NaaS Product Developer</div><div>4. Naas Product Manager</div><div>5. Platform Category Manager / Portfolio Manager</div></div> <div><div>6. Product Analyst</div><div>7. Product Engineer</div><div>8. Product Manager</div><div>9. Product Manager (Industry Vertical)</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| Regulatory and Compliance      | <div><div>1. Compliance Specialist</div><div>2. Data Enterprise Governance Officer</div><div>3. Data Privacy Officer</div></div> <div><div>4. ESG Specialist</div><div>5. Policy and Regulatory Affairs Manager</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| Sales Management               | <div><div>1. Channel Sales Executive</div><div>2. Channel Sales Manager</div><div>3. Enterprise Solution Sales Manager</div></div> <div><div>4. Product Sales Specialist</div><div>5. Sales Executive / Account Executive</div><div>6. Sales Manager / Account Manager</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| Satellite Network              | <div><div>1. Satellite Engineer</div><div>2. Satellite Installer / Technician</div></div> <div><div>3. Satellite Link Planner</div><div>4. Satellite Manager / Delivery Manager</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| Security Services              | <div><div>1. Cyber Risk Analyst</div><div>2. Cyber Risk Manager</div><div>3. Cybersecurity Specialist / Cybersecurity Engineer</div><div>4. Cybersecurity Support Engineer</div><div>5. Security Architect / Security Engineer</div></div> <div><div>6. Security Product Engineer</div><div>7. Security Product Manager</div><div>8. SOC Analyst</div><div>9. SOC Incident Investigator</div><div>10. SOC Manager / SOC VAPT Manager</div><div>11. SOC Operations Engineer</div></div>                                                                                                                                                                                                                                                                                                                                 |  |
| Transmission Network           | <div><div>1. 5G Wireless Network Engineer</div><div>2. Microwave Engineer</div><div>3. Optical Transmission Engineer</div><div>4. Transmission Engineer</div></div> <div><div>5. Transmission Manager</div><div>6. Transmission Network Planner</div><div>7. Transmission Technician</div><div>8. Wireless Network Engineer</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |



# Skills Clusters and Skills



25 skills clusters, two (2) basic skills clusters and 23 specific skills clusters, have been identified in the Telecommunications sector.

| Skills Category | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BASIC SKILLS    |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                 | Essential skills required for a person to be fit for a job.                                                                                                                                                                                                                                                                                                                                                                       |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                 | <b>Innovation and Delivery</b>                                                                                                                                                                                                                                                                                                                                                                                                    |
|                 | <div><div><ul style="list-style-type: none"><li>• Adaptability and Resiliency</li><li>• Business Acumen</li><li>• Change Management</li><li>• Cognitive Skills</li><li>• Critical Thinking</li></ul></div><div><ul style="list-style-type: none"><li>• Digital and AI Fluency</li><li>• Innovative Thinking</li><li>• Learning Agility</li><li>• Planning and Organising</li><li>• Sustainability Awareness</li></ul></div></div> |
|                 | <b>Social Intelligence</b>                                                                                                                                                                                                                                                                                                                                                                                                        |
|                 | <div><div><ul style="list-style-type: none"><li>• Coaching and Mentoring</li><li>• Communication</li><li>• Conflict Management</li></ul></div><div><ul style="list-style-type: none"><li>• Empathy</li><li>• Influencing and Negotiation</li><li>• Teamwork and Collaboration</li></ul></div></div>                                                                                                                               |

| Skills Category | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPECIFIC SKILLS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                 | Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques.                                                                                                                                                                                                                                                                                                                                                                                        |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                 | <b>Accounting and Finance Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                 | <div><div><ul style="list-style-type: none"><li>• Accounting Principles</li><li>• Billing Process Improvement Management</li></ul></div><div><ul style="list-style-type: none"><li>• Financial Analysis</li><li>• Financial Management</li></ul></div></div>                                                                                                                                                                                                                                                                                                                  |
|                 | <b>Agile and Continuous Improvement</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                 | <div><div><ul style="list-style-type: none"><li>• Continuous Improvement</li></ul></div><div><ul style="list-style-type: none"><li>• Process Re-engineering</li></ul></div></div>                                                                                                                                                                                                                                                                                                                                                                                             |
|                 | <b>Branding, Sales, and Marketing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                 | <div><div><ul style="list-style-type: none"><li>• Brand Management</li><li>• Content Writing and Editing</li><li>• Go-To-Market Strategy</li><li>• Market Profiling</li><li>• Market Research and Analytics</li><li>• Marketing Campaign Management</li><li>• Marketing Mix Management</li></ul></div><div><ul style="list-style-type: none"><li>• Media Relation Management</li><li>• Product Branding</li><li>• Sales Strategy and Execution</li><li>• Sales Target Management</li><li>• Selling</li><li>• Visual Design and Communication Principles</li></ul></div></div> |
|                 | <b>Business Development and Strategy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                 | <div><div><ul style="list-style-type: none"><li>• Business Opportunities Development</li><li>• Business Performance Management</li><li>• Revenue Analysis</li><li>• Solutions Design Thinking</li><li>• Strategy Development and Implementation</li></ul></div><div><ul style="list-style-type: none"><li>• Strategy Development and Implementation Management</li><li>• Strategy Planning</li><li>• Systems Thinking</li><li>• User Experience Evaluation</li><li>• User Research</li></ul></div></div>                                                                      |
|                 | <b>Business Operation Management</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                 | <div><div><ul style="list-style-type: none"><li>• Access Control Management</li><li>• Applications Support and Enhancement</li><li>• Contact Management</li><li>• Dashboard Creation and Visualisation</li><li>• Data Centre Facilities Management</li></ul></div><div><ul style="list-style-type: none"><li>• Incident Reporting</li><li>• Market Trend Analysis</li><li>• Operations Reporting Protocol</li><li>• Product Lifecycle Management</li><li>• Reporting and Documentation</li></ul></div></div>                                                                  |



# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Customer Service and Experience                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Customer Experience Design</li><li>Customer Experience Management</li><li>Customer Profiling</li><li>Paid Research Engine Marketing (SEM)</li><li>Search Engine Optimisation (SEO)</li><li>Service Excellence</li><li>Social Media Marketing</li></ul>                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | Customer, Vendor, and Stakeholder Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Account Management</li><li>Customer Acquisition and Retention Management</li><li>Customer Behaviour Analysis</li><li>Customer Challenges Management</li><li>Customer Management</li><li>Customer Relationship Management</li><li>Service Level Management</li><li>Stakeholder Management</li><li>Technical Sales Support</li><li>Vendor Management</li></ul>                                                                                                                    |
|                                                                                                                                                                                                                      | Data Development and Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Big Data Analytics</li><li>Data Collection and Analysis</li><li>Data Engineering</li><li>Data Literacy</li><li>Data Mining and Modelling</li><li>Data Modelling and Design</li><li>Data Science</li><li>Data Storyboarding</li><li>Data Strategy</li><li>Data Visualisation</li><li>Data Wrangling</li><li>Database Design</li><li>Database Management</li><li>Database Querying</li><li>Database Security</li><li>Statistical Analytics</li><li>Predictive Modelling</li></ul> |
|                                                                                                                                                                                                                      | Engineering and Maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Civil and Structural Engineering Management</li><li>Civil Structure Maintenance</li><li>Electrical Engineering</li><li>Electrical Field Maintenance</li><li>Electrical Measurement Devices Operations</li><li>Electrical Termination, Connection and Measurement</li><li>Electrical Wiring Interconnection Systems Maintenance</li><li>Engineering Drawing and Design Specifications</li><li>Engineering Support</li></ul>                                                      |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Engineering and Maintenance (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Engineering, Procurement and Construction Management</li><li>Equipment and Systems Repair</li><li>Equipment and Systems Testing</li><li>Equipment Management</li><li>Equipment Maintenance</li><li>Facility Maintenance</li><li>Fibre Splicing</li><li>Green Energy Integration</li><li>Mathematical Concepts Application</li><li>Mechanical Engineering Management</li><li>Mechanical Field Maintenance</li><li>Predictive Maintenance</li><li>Preventive Maintenance</li><li>Reliability Engineering</li><li>Satellite Network Optimisation</li><li>Satellite Systems Engineering</li><li>Structural Testing</li><li>Troubleshooting</li></ul>                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | General Business Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Budget Management</li><li>Business Networking</li><li>Business Development</li><li>Business Innovation</li><li>Business Needs Analysis</li><li>Organisational Analysis Management</li><li>Cost Management</li><li>Resource Management</li><li>Technical Presentation</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | Health, Safety, and Environment (HSE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Design for Safety</li><li>Design for Safety, Standards and Specification</li><li>Eco-Design Principles</li><li>Eco-Friendly Site Selection</li><li>Emergency Management</li><li>Emergency Response</li><li>Energy Management and Audit</li><li>Environment and Social Governance</li><li>Environment, Health and Safety</li><li>Fire Prevention and Firefighting</li><li>Health, Safety and Environment Procedures Implementation</li><li>Incident Management</li><li>Renewable Energy</li><li>Security Awareness</li><li>Sustainability Management</li><li>Sustainable Business Practices</li><li>Waste Management</li><li>Workplace Safety and Health</li><li>Workplace Safety and Health Incident Management</li><li>Workplace Safety and Health Performance Management</li><li>Workplace Safety and Health Practices Implementation</li><li>Safety Assessment</li></ul> |



# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Legal and Regulatory                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Knowledge of Legal and Compliance</li><li>Legal and Regulatory Research</li></ul>                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                      | Manufacturing and Production                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Operations Performance</li><li>Systems-Based Solutions for Facilities</li><li>Troubleshooting and Maintenance</li></ul>                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | People Management and Development                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Operational Change Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | Products and Services                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Category Management</li><li>Demand and Supply Analysis</li><li>Digital Marketing</li><li>Inbound Marketing</li><li>Infrastructure Support</li><li>Network Administration and Maintenance</li><li>Pricing Strategy</li><li>Product Advisory</li><li>Product Demonstration</li><li>Product Design and Development</li><li>Product Knowledge</li><li>Product Management</li><li>Product Strategy</li><li>Product Requirements</li></ul> |
|                                                                                                                                                                                                                      | Project and Process Management                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Configuration Management</li><li>Drive Testing</li><li>Engineering Drawing Interpretation</li><li>Permit Management</li><li>Project Management</li><li>Prompt Engineering</li><li>Site Access Coordination</li><li>Site Assessment and Analysis</li><li>Business Process Management</li><li>Process Automation</li><li>Requirements Definition and Management</li><li>Process Optimisation</li></ul>                                 |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Quality Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Audit Compliance</li><li>Failure Analysis</li><li>Product Performance Management</li><li>Product Quality</li><li>Product Testing</li><li>Quality Assurance Management</li><li>Quality Control and Assurance</li><li>Root Cause Analysis (RCA)</li><li>Service Quality Management</li><li>Technical Inspection</li><li>Test Development</li><li>Test Planning</li><li>Quality Standards</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | Research and Development (R&D)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Digital and Physical Prototyping</li><li>Firmware Testing and Validation</li><li>Product Development Lifecycle</li><li>Research and Information Synthesis</li><li>Technical Report Writing</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | Risk Management, Compliance, and Governance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Artificial Intelligence Ethics and Governance</li><li>Audit and Compliance Strategy Development</li><li>Business Continuity Management</li><li>Business Risk Management</li><li>Compliance Reporting</li><li>Corporate Governance</li><li>Crisis and Disaster Recovery Management</li><li>Cyber and Data Breach Incident Management</li><li>Cyber Forensics</li><li>Cyber Incident Management</li><li>Cyber Risk Management</li><li>Cybersecurity Basics</li><li>Cybersecurity Framework Application</li><li>Cybersecurity Management</li><li>Data Ethics</li><li>Data Governance</li><li>Data Privacy and Security</li><li>Data Protection Management</li><li>Incident Response</li><li>Internal Audit</li><li>IT Compliance and Governance</li><li>IT Governance</li><li>IT Standards</li><li>Organisational Strategy and Policy Realisation</li><li>Policy Implementation and Revision</li><li>Regulatory Compliance</li><li>Regulatory Risk Assessment</li><li>Regulatory Submission Expertise</li><li>Risk Governance</li><li>Risk Management</li><li>Risk Modelling and Validation</li><li>Security Administration</li><li>Security Governance</li><li>Security Monitoring</li><li>Security Strategy</li><li>Technology Risk Management</li><li>Threat Analysis and Defence</li><li>Threat and Vulnerability Management</li><li>Threat Intelligence and Detection</li></ul> |



# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <div><b>Software Development and Implementation</b><ul style="list-style-type: none"><li>Advanced Programming Language</li><li>Agile Software Development</li><li>Application Programming Interface (API) Management</li><li>Applications Development</li><li>Applications Integration</li><li>Artificial Intelligence Application</li><li>Artificial Intelligence Management</li><li>Business Support Systems (BSS)</li><li>Cloud Architecture</li><li>Cloud Computing</li><li>Cloud Security</li><li>Computational Modelling</li><li>Configuration Tracking</li><li>Containerisation and Orchestration</li><li>Continuous Integration and Continuous Deployment (CI/CD)</li><li>Data Warehouse Solutions</li><li>Device Integration</li><li>DevOps</li><li>DecSecOps</li><li>Embedded Systems Programming</li><li>Firmware Development</li><li>Network Analysis</li><li>Network and Systems Administration</li><li>Network Automation</li><li>Network Configuration and Troubleshooting</li><li>Network Monitoring</li><li>Network Optimisation</li><li>Network Simulation and Modeling</li><li>Network Slicing</li><li>Network System Planning and Design</li><li>Network Virtualisation</li><li>Networking Fundamentals</li><li>Network Orchestration and Automation</li><li>Operating System</li><li>Optical Networking Technologies</li><li>Programming, Coding and Scripting</li><li>Quality Engineering</li><li>Real-Time / Embedded Systems Development</li><li>Real-Time Operating System (RTOS)</li><li>Security Assessment and Testing</li><li>Security Programme Management</li><li>Software Configuration</li><li>Software Development Lifecycle (SDLC)</li><li>Software Security</li><li>Software Testing</li><li>Structured Query Language (SQL)</li><li>System Installation / Decommissioning</li><li>System Integration and Configuration</li><li>Testing</li><li>TCP/ IP and Networking Protocols</li><li>User Testing and Usability Testing</li></ul></div> <div><b>Supply Chain and Logistics Management</b><ul style="list-style-type: none"><li>Supplier Management</li></ul></div> |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <div><b>Technical Design and Architecture</b><ul style="list-style-type: none"><li>Data Design</li><li>Embedded Software Design</li><li>Embedded Systems Integration</li><li>Embedded Systems Interface Design</li><li>Enterprise Architecture</li><li>Information Architecture</li><li>Information Security</li><li>Infrastructure as Code (IaC)</li><li>Hardware Design and Development</li><li>Infrastructure Deployment</li><li>Infrastructure Design</li><li>Infrastructure Development</li><li>Microwave Link Design</li><li>Natural Language Processing</li><li>Network Security</li><li>Propagation Modeling</li><li>Radio Frequency Engineering</li><li>Security Architecture</li><li>Software Design and Development</li><li>Solution Architecture</li><li>System Architecture</li><li>Systems Design</li><li>User Experience (UX) Design</li><li>User Interface and User Experience (UI/UX) Optimisation</li><li>User Interface (UI) Design</li><li>Wireframing</li><li>Network Design</li></ul></div> <div><b>Technology Management</b><ul style="list-style-type: none"><li>Artificial Intelligence Application in Product Development</li><li>Artificial Intelligence Deployment</li><li>Artificial Intelligence Management</li><li>Back-End Technologies</li><li>Capacity Management</li><li>Edge Computing</li><li>Emerging Technology Monitoring</li><li>Emerging Technology Synthesis</li><li>Front-End Technologies</li><li>Hardware and Software Troubleshooting</li><li>Infrastructure Strategy</li><li>Internet of Things Management</li><li>IT Strategy</li><li>Knowledge of Artificial Intelligence</li><li>Machine Learning</li><li>Machine Learning Models</li><li>Model Context Protocol</li><li>Platform Knowledge and Deployment</li><li>Portfolio Management</li><li>Security Information and Event Management (SIEM)</li><li>System Performance Management</li><li>Systems Integration</li><li>Technical Support</li><li>Technology and Systems Application</li><li>Technology Infrastructure Management and Integration</li><li>Vulnerability Assessment and Penetration Testing</li><li>Wireless Network</li></ul></div> |



# In-Demand Skills



The rapid evolution of the Telecommunications sector, driven by AI integration, digital expansion, and sustainability goals, is fundamentally reshaping workforce requirements. To successfully navigate this sector-wide transformation, telecommunications companies are prioritising talent strategies that merge essential human skills with new technological proficiencies. Core interpersonal abilities such as communication, teamwork, and empathy remain crucial for managing complex stakeholder engagements and fostering collaboration. Simultaneously, skills such as adaptability, critical thinking, and learning agility are increasingly vital to keep pace with rapid technological advancements and evolving regulatory requirements. The sector is further nurturing a culture of innovation and continuous improvement, emphasising digital and AI fluency to enhance both operational efficiency and customer engagement. As these shifts accelerate, the telecommunications workforce is evolving into a more dynamic, resilient, and forward-looking, equipped to support a digitally advanced and sustainable sector ecosystem.

| Skills Category        | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Top 10 Basic Skills    | <b>Innovation and Delivery</b>                                                                                                                                                                                                                                                                                                                                                                                                     |
|                        | <div><div>• Adaptability and Resiliency</div><div>• Cognitive Skills</div><div>• Critical Thinking</div></div> <div><div>• Digital and AI Fluency ●</div><div>• Learning Agility</div><div>• Sustainability Awareness ●</div></div>                                                                                                                                                                                                |
|                        | <b>Social Intelligence</b>                                                                                                                                                                                                                                                                                                                                                                                                         |
|                        | <div><div>• Communication</div><div>• Empathy</div></div> <div>• Teamwork and Collaboration</div>                                                                                                                                                                                                                                                                                                                                  |
| Top 10 Specific Skills | <div><div>• Networking Fundamentals ●</div><div>• Network Security ●</div><div>• Network Configuration and Troubleshooting ●</div><div>• TCP / IP and Networking Protocols ●</div><div>• Cloud Computing ●</div></div> <div><div>• Infrastructure Strategy</div><div>• Infrastructure Deployment</div><div>• Network Administration and Maintenance ●</div><div>• Infrastructure Design</div><div>• Prompt Engineering</div></div> |
|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                    |

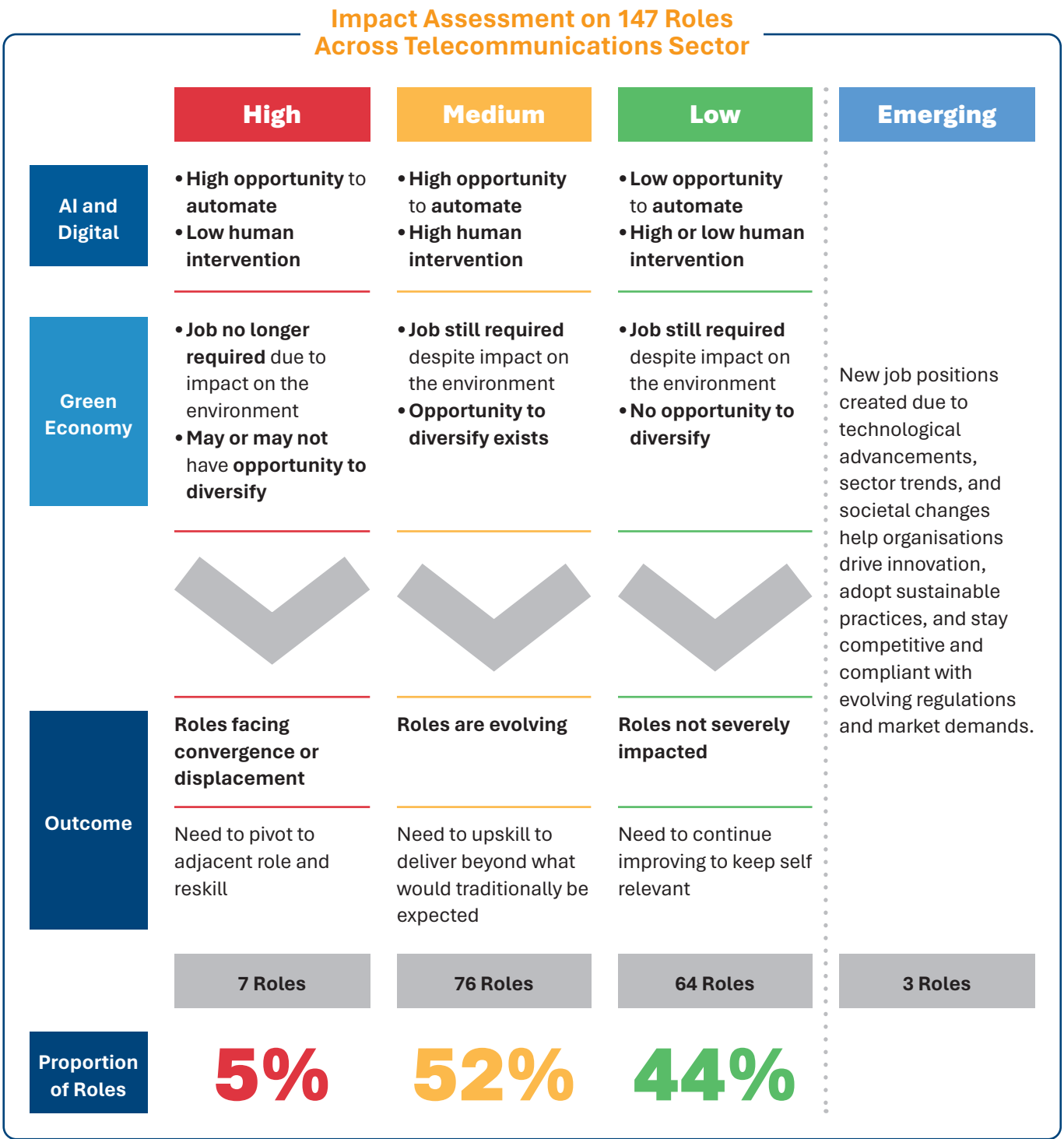
- AI / Digital Skills
- Green Skills

|    |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <b>Networking Fundamentals</b>                   | <ul style="list-style-type: none"><li>• The core knowledge for managing modern networks. As organisations depend on seamless communication and data transfer, mastering networking principles ensures reliable connectivity, optimised performance, and effective troubleshooting.</li></ul>                                                                                                                      |
| 2  | <b>Network Security</b>                          | <ul style="list-style-type: none"><li>• With cyber threats on the rise, protecting sensitive data transmitted over networks is vital. Strong security safeguards customer information, ensures regulatory compliance, and preserves the trust and integrity of communication systems.</li></ul>                                                                                                                   |
| 3  | <b>Network Configuration and Troubleshooting</b> | <ul style="list-style-type: none"><li>• Essential for maintaining optimal network performance and reliability. Precise configuration and quick issue resolution are essential in today’s complex networks. These skills minimise downtime, enhance user experience, and keep services running seamlessly.</li></ul>                                                                                               |
| 4  | <b>TCP/IP and Networking Protocols</b>           | <ul style="list-style-type: none"><li>• Understanding of these protocols is essential for designing, implementing, and managing networks, as they enable reliable data transmission, interoperability between devices, and efficient routing of information across diverse network environments.</li></ul>                                                                                                        |
| 5  | <b>Cloud Computing</b>                           | <ul style="list-style-type: none"><li>• A catalyst for scalability and flexibility. Cloud integration enhances service delivery, streamlines operations, and supports the growing need for remote collaboration; key for telecoms evolving into digital service providers.</li></ul>                                                                                                                              |
| 6  | <b>Infrastructure Strategy</b>                   | <ul style="list-style-type: none"><li>• Crucial for planning and optimising the deployment of network resources to meet evolving customer needs and technological advancements. Strategic planning of network resources drives efficiency, lowers costs, and ensures scalability. It empowers telecom providers to deliver high-quality services and transition smoothly into next-generation networks.</li></ul> |
| 7  | <b>Infrastructure Deployment</b>                 | <ul style="list-style-type: none"><li>• Fast, efficient rollout of network capabilities is integral to meeting rising demand. Strong deployment practices expand connectivity, accelerate service launches, and secure competitive advantage.</li></ul>                                                                                                                                                           |
| 8  | <b>Network Administration and Maintenance</b>    | <ul style="list-style-type: none"><li>• Central to keeping networks operational and reliable. As systems grow more complex, skilled administrators are needed to monitor performance, apply updates, and resolve issues to maintain uptime and deliver quality service.</li></ul>                                                                                                                                 |
| 9  | <b>Infrastructure Design</b>                     | <ul style="list-style-type: none"><li>• Designing resilient, scalable networks is vital to support future technologies. Effective design optimises resource use, strengthens service delivery, and prepares operators for evolving demands.</li></ul>                                                                                                                                                             |
| 10 | <b>Prompt Engineering</b>                        | <ul style="list-style-type: none"><li>• In the AI era, precise prompt design unlocks smarter solutions. It enables better data insights, personalised customer support, and sharper decision-making, thereby boosting efficiency and user experience.</li></ul>                                                                                                                                                   |



# Roles and Skills Analysis by Impact Level

Based on insights gathered through workshops and engagements, sector players in the Telecommunications sector provided high-level assessments on how AI, Digital, and Green Economy are reshaping existing roles within their organisations. These insights informed the classification of roles into three (3) impact levels: high, medium, and low, reflecting the extent to which technological disruption and sustainability imperatives are influencing workforce transformation. This impact study highlights how roles central to network engineering, cybersecurity, cloud, and infrastructure management are being redefined, while also identifying new and emerging positions that will drive innovation in areas such as edge computing and AI-driven network optimisation. By mapping these shifts, the study provides a clear view of the career pathways and skills required to build a resilient, future-ready workforce capable of supporting Malaysia’s long-term competitiveness in the Telecommunications sector.



# Overview of Roles by Impact Level

The impact study has identified a total of 147 roles that form the backbone of Malaysia’s Telecommunications sector. These roles were analysed and categorised according to their level of impact from ongoing sector shifts, particularly the accelerating forces of AI, Digital, and the Green Economy. A total of seven (7) roles were classified as highly impacted, as they are undergoing the most significant transformation in response to these trends. 76 roles were categorised as medium-impacted. These positions remain essential to maintaining network reliability, operational efficiency, and customer service, but are experiencing more incremental changes through digitalisation and automation. Meanwhile, 64 roles were classified as low-impacted, representing functions that, while still necessary, face relatively minimal disruption from emerging technologies or sustainability imperatives. In addition, the study identified three (3) emerging roles that are expected to drive the next wave of sectoral transformation.

| HIGH                               | MEDIUM                                                   |                                         |                                                      |
|------------------------------------|----------------------------------------------------------|-----------------------------------------|------------------------------------------------------|
| 7 Roles                            | 76 Roles                                                 |                                         |                                                      |
| 1. Drive Tester                    | 1. Access Network Designer/ Planner                      | 24. Network Deployment Engineer         | 52. Cyber Risk Analyst                               |
| 2. Network Analyst                 | 2. Access Network Engineer                               | 25. Network Tester/ QA Engineer         | 53. Cyber Risk Manager                               |
| 3. NOC Engineer                    | 3. Access Network Technician                             | 26. Energy Manager                      | 54. Cybersecurity Specialist/ Cybersecurity Engineer |
| 4. NOC Manager                     | 4. RAN Engineer                                          | 27. Safety Officer                      | 55. SOC Analyst                                      |
| 5. Application Support Engineer    | 5. RF Engineer/ RF Specialist                            | 28. HVAC Engineer/ Specialist           | 56. SOC Incident Investigator                        |
| 6. Cybersecurity Support Engineer  | 6. RAN/RF Manager                                        | 29. Data Centre Operations Engineer     | 57. SOC Manager/ SOC VAPT Manager                    |
| 7. Customer Service Representative | 7. DAS Engineer                                          | 30. Data Centre Network Engineer        | 58. SOC Operations Engineer                          |
|                                    | 8. Core Network Engineer                                 | 31. Data Centre Security Specialist     | 59. Data Scientist                                   |
|                                    | 9. Core Network Manager                                  | 32. Satellite Engineer                  | 60. Product Engineer                                 |
|                                    | 10. Fibre Optic Engineer                                 | 33. Satellite Link Planner              | 61. Cloud Developer                                  |
|                                    | 11. Infrastructure Designer/ Engineer                    | 34. Satellite Manager/ Delivery Manager | 62. Cloud Engineer                                   |
|                                    | 12. Infrastructure Operations Engineer                   | 35. Application Engineer                | 63. Cloud Analyst                                    |
|                                    | 13. Infrastructure Project Manager/ Construction Manager | 36. Site Reliability Engineer           | 64. Cloud FinOps Engineer                            |
|                                    | 14. Project Engineer                                     | 37. Software Engineer                   | 65. Customer & Market Insights Analyst               |
|                                    | 15. Site Access Executive                                | 38. SysOps Engineer                     | 66. Customer Service Manager                         |
|                                    | 16. Structure Engineer                                   | 39. System Engineer                     | 67. Customer Support Engineer (Mobile Services)      |
|                                    | 17. Structure Manager                                    | 40. System Support Engineer             | 68. Product Marketing Executive                      |
|                                    | 18. Telecommunications Technician                        | 41. Test Engineer/ QA Engineer          | 69. Product Marketing Manager                        |
|                                    | 19. Tower Maintenance Technician                         | 42. Unified Communication (UC) Engineer | 70. Digital Marketing Executive                      |
|                                    | 20. Field Engineer                                       | 43. OSS Engineer                        | 71. Digital Marketing Manager                        |
|                                    | 21. Network Administrator                                | 44. OSS Analyst                         | 72. Marketing Executive                              |
|                                    | 22. Network Engineer                                     | 45. BSS Engineer                        | 73. Marketing Manager                                |
|                                    | 23. Network Manager                                      | 46. Billing Analyst                     | 74. Marketing Communication Specialist               |
|                                    |                                                          | 47. Machine Learning Engineer           | 75. Product Analyst                                  |
|                                    |                                                          | 48. UI Designer                         | 76. 5G Systems Engineer                              |
|                                    |                                                          | 49. UX Designer                         |                                                      |
|                                    |                                                          | 50. Operations Centre Support Engineer  |                                                      |
|                                    |                                                          | 51. Equipment Engineer                  |                                                      |



# Overview of Roles by Impact Level (Continued)

| LOW                                                       |                                                |                                                        |                                        |
|-----------------------------------------------------------|------------------------------------------------|--------------------------------------------------------|----------------------------------------|
| 64 Roles                                                  |                                                |                                                        |                                        |
| 1. Fibre Optic Network Manager                            | 18. Transmission Engineer                      | 42. Security Product Manager                           | 61. Data Privacy Officer               |
| 2. Fibre Optic Technician/ Fibre Splicer/ Cable Installer | 19. Microwave Engineer                         | 43. Data Engineer                                      | 62. Data Enterprise Governance Officer |
| 3. Site Acquisition Specialist                            | 20. Optical Transmission Engineer              | 44. Cloud Product Manager                              | 63. ESG Specialist                     |
| 4. Telecom Fibre Director                                 | 21. Wireless Network Engineer                  | 45. NaaS Product Developer                             | 64. Business Strategy and Modelling    |
| 5. Telecom Tower Director                                 | 22. 5G Wireless Network Engineer               | 46. NaaS Product Manager                               |                                        |
| 6. Tower Crew Lead                                        | 23. Transmission Manager                       | 47. Platform Category Manager/ Portfolio Manager       |                                        |
| 7. Tower Operations Manager                               | 24. Network Architect                          | 48. Product Manager                                    |                                        |
| 8. Tower Technician/ Tower Climber/ Tower Installer       | 25. DevOps Engineer                            | 49. Product Manager (Industry Vertical)                |                                        |
| 9. Field Technician                                       | 26. DevSecOps Engineer                         | 50. Data Product Manager                               |                                        |
| 10. Network Automation Engineer                           | 27. Embedded Systems Engineer                  | 51. Customer Experience Manager                        |                                        |
| 11. Chargeman                                             | 28. Embedded Systems Engineering Manager       | 52. Customer Support Engineer (Enterprise & Technical) |                                        |
| 12. Facilities Technician                                 | 29. Full Stack Developer                       | 53. Channel Sales Executive                            |                                        |
| 13. Data Centre Architect                                 | 30. Software Architect                         | 54. Channel Sales Manager                              |                                        |
| 14. Core Network Architect                                | 31. Solution Engineer/ Pre-Sales Engineer      | 55. Enterprise Solution Sales Manager                  |                                        |
| 15. Satellite Installer/ Technician                       | 32. IoT Systems Engineer                       | 56. Product Sales Specialist                           |                                        |
| 16. Transmission Technician                               | 33. IoT Solution Architect                     | 57. Sales Executive/ Account Executive                 |                                        |
| 17. Transmission Network Planner                          | 34. IoT Software Engineer                      | 58. Sales Manager/ Account Manager                     |                                        |
|                                                           | 35. OSS Architect                              | 59. Compliance Specialist                              |                                        |
|                                                           | 36. BSS Architect                              | 60. Policy and Regulatory Affairs Manager              |                                        |
|                                                           | 37. Solution Architect                         |                                                        |                                        |
|                                                           | 38. Cloud Architect                            |                                                        |                                        |
|                                                           | 39. Cloud Network Engineer/IT Network Engineer |                                                        |                                        |
|                                                           | 40. Security Architect/ Security Engineer      |                                                        |                                        |
|                                                           | 41. Security Product Engineer                  |                                                        |                                        |

## EMERGING

3 Roles

- 1. Artificial Intelligence Engineer
- 2. Artificial Intelligence Ethics Officer
- 3. Edge Computing Specialist

# Highly Impacted Roles and Career Pathways



In the Telecommunications sector, highly impacted roles are those most exposed to automation, particularly where tasks are structured and repetitive. Approximately 5% of roles fall into this category, with functions such as network monitoring, alert response, and first-level troubleshooting increasingly being handled by AI-driven systems. These technologies can process vast volumes of network, application, and security data in real time, often faster and more accurately than human operators. As automation takes over these responsibilities, the nature of work for human workers will transition towards higher-value responsibilities such as complex decision-making, innovation, and ethical oversight. These positions, once reliant on repetitive workflows, are now being redefined by intelligent automation and advanced analytics. While their direct exposure to Green Economy shifts is limited, their transformation underscores a sector-wide pivot towards digitally enhanced, efficiency-driven operations. For these roles to remain relevant and sustainable, targeted upskilling and reskilling initiatives will be essential to align human capabilities with the evolving demands of a digitally transformed telecommunications landscape.

## Overview of Seven (7) Highly Impacted Roles

| Job Cluster                       | Roles                                                                                                          |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------|
| Access Network                    | <ul style="list-style-type: none"><li>• Drive Tester</li></ul>                                                 |
| Customer Services and Support     | <ul style="list-style-type: none"><li>• Customer Service Representative</li></ul>                              |
| Network Operations and Management | <ul style="list-style-type: none"><li>• Network Analyst</li><li>• NOC Engineer</li><li>• NOC Manager</li></ul> |
| Security Services                 | <ul style="list-style-type: none"><li>• Cybersecurity Support Engineer</li></ul>                               |



# Highly Impacted Roles Career Pathways

Highly Impacted Role

#01

Access Network Drive Tester

With the widespread automation of back-office processes reducing reliance on manual data entry and paper-based tasks, this role is likely to be automated through cutting-edge tools to support evolution of communication networks.

**Job Purpose:**

- Conduct and analyse network installation and drive tests to measure capacity, coverage, and quality, while developing improved evaluation methods.

| AI                                                                                                                                                                  | DIGITAL SKILLS                                                                                                                                                      | GREEN SKILLS                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI can facilitate analysis of vast data sets from drive tests and predict areas of improvements based on trends.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Drive testing tools can be automated to collect data.</p>                                                            | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential, as at the moment, environmental requirements do not alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Human expertise is only needed when manual data collection or to make ad-hoc decisions on area testing.</p>                | <p><b>Low Human Intervention:</b></p> <p>Human intervention is only required to analyse data, drive test results, and understand the context of network issues.</p> | <p><b>High Opportunity to Diversify:</b></p> <p>The role has limited potential for this role to diversify.</p>                                                            |



### Case Study

Dingli<sup>86</sup>

Dingli, a global leader in mobile network testing and measurement solutions, has partnered with China Telecom to deploy its automated drive test systems. The solution integrates the Pilot Matrix Platform with the Pilot Fleet Edge data processing platform. It leverages the Pilot Matrix’s robust and flexible testing capabilities, including its multi-module voice and data processing across 5G New Radio (NR) and Long Term Evolution (LTE) bands, with the Pilot Fleet Edge’s real-time monitoring and automated test configuration. This automation reduces manual effort, accelerates testing cycles, and provides scalable, high-precision network insights to support China’s rapid 5G expansion and operational excellence.

86. Dingli. (2023). Revolutionizing Mobile Network Testing and Optimization: Dingli’s Success with China Telecom. Dingli Telecom Case Studies. <https://telecom.dingli.com/case/revolutionizing-mobile-network-testing-and-optimization-dinglis-success-with-china-telecom/>.

| Upskilling and Reskilling                                                                                                                                                                            |                                                                                                                                                                                | Potential Career Pathways                                                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                 | Additional Skills*                                                                                                                                                             | Possible Roles for Transition Within the Sector                                                                                                                                                                           |
| <ul style="list-style-type: none"><li>Networking Fundamentals ●</li><li>Network Configuration and Troubleshooting ●</li><li>Network Optimisation ●</li><li>Big Data Analytics ●</li></ul>            | <ul style="list-style-type: none"><li>Network Security ●</li><li>Network Slicing ●</li><li>System Simulation and Verification ●</li><li>Quality Assurance Management</li></ul> | <p><b>1. Access Network: RF Engineer / RF Specialist</b></p> <p>Coordinate material flow, delivery, stock levels, and inspections to ensure timely and safe supply aligned with site needs and construction progress.</p> |
| <ul style="list-style-type: none"><li>Networking Fundamentals ●</li><li>Network Configuration and Troubleshooting ●</li><li>TCP / IP and Networking Protocols ●</li></ul>                            | <ul style="list-style-type: none"><li>Configuration Management</li><li>Configuration Tracking ●</li><li>Quality Assurance Management</li><li>Process Automation</li></ul>      | <p><b>2. Network Operation and Management: Network Tester / QA Engineer</b></p> <p>Validate and verify quality of network rollout deliverables to ensure they meet engineering, regulatory, and customer standard.</p>    |
| <ul style="list-style-type: none"><li>Networking Fundamentals ●</li><li>Network Configuration and Troubleshooting ●</li><li>Wireless Network ●</li><li>TCP / IP and Networking Protocols ●</li></ul> | <ul style="list-style-type: none"><li>Network Administration and Maintenance ●</li><li>Network Security ●</li><li>Technical Inspection</li><li>Technical Support</li></ul>     | <p><b>3. Passive Infrastructure: Field Technician</b></p> <p>Install and troubleshoot telecommunications equipment and connectivity.</p>                                                                                  |
| <ul style="list-style-type: none"><li>Test Planning</li></ul>                                                                                                                                        | <ul style="list-style-type: none"><li>Continuous Integration and Continuous Deployment ●</li><li>Software Testing ●</li><li>System Performance Management ●</li></ul>          | Possible Roles for Transition into Other Sectors                                                                                                                                                                          |
|                                                                                                                                                                                                      |                                                                                                                                                                                | <p><b>1. ICT: Performance Tester</b></p> <p>Design, develop, and execute performance tests to evaluate software responsiveness, stability, and scalability.</p>                                                           |



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#02

Network Operations and Management: Network Analyst

This role is at high risk of automation due to the advancements of AI-driven network monitoring and troubleshooting.

**Job Purpose:**

- Manage network operations, troubleshooting, upgrades, service recovery, and performance reporting.

| AI                                                                                                                                                                                                     | DIGITAL SKILLS                                                                                                                                                       | GREEN SKILLS                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI can automate tasks such as network monitoring, anomaly detection, and report generation.</p>                                                         | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools streamline traffic analysis, log monitoring, compliance checks, and performance reports.</p>            | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential, as environmental requirements do not alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Human oversight is required to validate AI-generate insights, make strategic optimisation decisions, interpret unusual patterns, and implement solutions.</p> | <p><b>Low Human Intervention:</b></p> <p>Analysts are only required to contextualise digital findings, communicate results, and troubleshoot multi-layer issues.</p> | <p><b>High Opportunity to Diversify:</b></p> <p>There is limited opportunity to diversify this role.</p>                                                   |

### Case Study

**IBM<sup>87</sup>**

As telecommunications networks grow more complex, traditional manual network management has become too slow, error-prone, and inefficient to meet today’s digital demands. Network automation now performs core functions such as configurations, provisioning, and testing, reducing reliance on human network analysts. With the integration of AI and machine learning, networks are evolving into self-healing systems capable of detecting, diagnosing, and resolving issues in real time across cloud, edge, and traditional environments. This transformation is redefining the role of network analysts, shifting their focus from repetitive monitoring to higher-value tasks such as strategic oversight, complex troubleshooting, and innovation in network performance.

| Upskilling and Reskilling                                                                                                                                                                                       |                                                                                                                                                                                            | Potential Career Pathways                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                            | Additional Skills*                                                                                                                                                                         | Possible Roles for Transition Within the Sector                                                                                                                                     |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li><li>• Network Security ●</li></ul> | <ul style="list-style-type: none"><li>• Network Slicing ●</li><li>• Network System Planning and Design ●</li><li>• Network Virtualisation ●</li><li>• Cloud Computing ●</li></ul>          | <p><b>1. Network Operations and Management: Network Engineer</b></p> <p>Ensure optimal performance and reliability of network infrastructure.</p>                                   |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li><li>• Network Security</li></ul>   | <ul style="list-style-type: none"><li>• Infrastructure Deployment</li><li>• Infrastructure Development</li><li>• Infrastructure Strategy</li><li>• Radio Frequency Engineering ●</li></ul> | <p><b>2. Access Network: RF Engineer/RF Specialist</b></p> <p>Develop and upkeep RAN infrastructure.</p>                                                                            |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li><li>• Network Security ●</li></ul> | <ul style="list-style-type: none"><li>• Infrastructure Deployment</li><li>• Infrastructure Development</li><li>• Infrastructure Strategy</li><li>• Radio Frequency Engineering ●</li></ul> | <p><b>3. Access Network: RF Engineer / RF Specialist</b></p> <p>Design and optimise RF systems, and manages the installation and maintenance of RF equipment.</p>                   |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li><li>• Network Security ●</li></ul> | <ul style="list-style-type: none"><li>• System Performance Management</li><li>• Network Simulation and Modeling</li><li>• Network Slicing</li><li>• Infrastructure Deployment ●</li></ul>  | <p><b>4. Transmission Network: Transmission Engineer</b></p> <p>Design, develop, and execute performance tests to evaluate software responsiveness, stability, and scalability.</p> |

87. IBM. (2023). What is Network Automation?. IBM Think Topics. <<https://www.ibm.com/think/topics/network-automation>>



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#03

Network Operations and Management: NOC Engineer

Advancements in network automation and the rise of “Dark NOC” – fully automated network operation centres that require minimal human oversight has significantly affected NOC Engineer roles.

**Job Purpose:**

- Manage network performance, troubleshooting, and system improvements in the NOC.

| AI                                                                                                                                                      | DIGITAL SKILLS                                                                                                                                                          | GREEN SKILLS                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI can automate network monitoring, detect incidents, and give performance analysis.</p>                 | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools and systems can automate most aspects of work monitoring, issue detection, and performance reporting.</p>  | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential, as environmental requirements do not significantly alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Human intervention is only needed for complex troubleshooting and critical support in case of emergencies.</p> | <p><b>Low Human Intervention:</b></p> <p>Human oversight is only required to integrate digital tools, solve complex issues, and validate documentation and reports.</p> | <p><b>High Opportunity to Diversify:</b></p> <p>There is limited opportunity to diversify this role.</p>                                                                 |

### Case Study

**British Telecom (BT)<sup>88</sup>**

BT is transforming its mobile network management by moving towards a software-driven, autonomous operations model known as the Dark Network Operations Centre (Dark NOC); reducing reliance on manual engineering. In partnership with AWS, BT is leveraging AI and machine learning to process petabytes of raw network data, transforming it into actionable insights for predictive maintenance and real-time optimisation. While still in the early stages, the initiative focuses on improving data quality and upskilling internal teams to full harness automation. This marks a pivotal step toward self-operating networks, signalling how traditional NOC engineering roles are being reshaped by AI-powered automation.

88.TelcoTitans. (2024). BT casts a ‘dark NOC’ vision for future network ops. BTwatch. <<https://www.telcotitans.com/btwatch/bt-casts-a-dark-noc-vision-for-future-network-ops/9235.article>>

| Upskilling and Reskilling                                                                                                                                                          |                                                                                                                                                       | Potential Career Pathways                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                               | Additional Skills*                                                                                                                                    | Possible Roles for Transition Within the Sector                                                                                                                                                                                         |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li></ul> | <ul style="list-style-type: none"><li>• Network Slicing ●</li><li>• Network System Planning and Design ●</li><li>• Network Virtualisation ●</li></ul> | <p><b>1. Network Operations and Management: Network Engineer</b></p> <p>Ensure optimal performance and reliability of network infrastructure.</p>                                                                                       |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li></ul> | <ul style="list-style-type: none"><li>• Infrastructure Deployment</li><li>• Infrastructure Development</li><li>• Infrastructure Strategy</li></ul>    | <p><b>2. Access Network: RAN Engineer</b></p> <p>Develop and upkeep RAN infrastructure.</p>                                                                                                                                             |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li></ul> | <ul style="list-style-type: none"><li>• Infrastructure Deployment</li><li>• Infrastructure Development</li><li>• Infrastructure Strategy</li></ul>    | <p><b>3. Access Network: RF Engineer / RF Specialist</b></p> <p>Design and optimise RF systems, as well as manage the installation and maintenance of RF equipment.</p>                                                                 |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li></ul> | <ul style="list-style-type: none"><li>• Technical Inspection</li><li>• Technical Support</li><li>• Wireless Network ●</li></ul>                       | <p><b>4. Network Operations and Management: Field Manager</b></p> <p>Ensure optimal performance and reliability of network infrastructure.</p>                                                                                          |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance</li><li>• Network Configuration and Troubleshooting ●</li></ul> | <ul style="list-style-type: none"><li>• Infrastructure Deployment</li><li>• Infrastructure Development</li><li>• Infrastructure Strategy</li></ul>    | <p><b>5. Transmission Network: Transmission Engineer</b></p> <p>Deploy and integrate transmission network infrastructure to ensure reliable, high-capacity connectivity across the telecommunications backbone and access networks.</p> |

● AI / Digital Skills    ● Green Skills    \*Skills are non-exhaustive

# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#04

Network Operations and Management: NOC Manager

NOC Engineer roles in the Telecommunications sector are highly impacted as the shift toward Dark NOC models enables AI-driven, self-operating networks that automate monitoring, fault detection, and response; significantly reducing the need for manual oversight in daily operations.

Job Purpose:

- Manage and oversee NOC activities, lead a team of technicians and engineers, and ensure optimal network performance, incident response, and service delivery.

| AI                                                                                                                                                                                                           | DIGITAL SKILLS                                                                                                                                                                              | GREEN SKILLS                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI can automate network monitoring, incident detection, and performance analysis, enhancing the ability to proactively manage and resolve network issues.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools and systems can automate many routine tasks in network monitoring, issue detection as well as performance reporting.</p>       | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential as environmental requirements do not alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Human judgement is still essential for complex troubleshooting and in the event of emergencies.</p>                                                                 | <p><b>Low Human Intervention:</b></p> <p>Human oversight is needed to integrate digital tools effectively, resolve complex problems, and ensure accuracy of reports and documentations.</p> | <p><b>High Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify</p>                                               |



Case Study

Vodafone<sup>89</sup>

Vodafone is modernising its European Network Operations Centres (NOCs) through a partnership with Celfocus, introducing full automation and intelligence-driven processes. At the core of this transformation is the Cognitive Intelligence and Automation Suite (CIAS), which leverages AI to identify patterns, predict potential issues, and automate responses, thereby enhancing efficiency, network reliability, and customer experience.

The initial rollout of CIAS has been completed in Portugal and Romania, supporting operations across all European markets. Plans are underway to expand deployment to additional countries, including the UK, with priority given to the top four (4) European markets.

89.Celfocus. (2024). Enabling Zero-Touch Automation of Network Operations. Celfocus News. <<https://www.celfocus.com/news/enabling-zero-touch-automation-of-network-operations>>

| Upskilling and Reskilling                                                                                                                                                                                        |                                                                                                                                                                                        | Potential Career Pathways                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                             | Additional Skills*                                                                                                                                                                     | Possible Roles for Transition Within the Sector                                                                                                                                                                                                 |
| <ul style="list-style-type: none"><li>• Networking Fundamentals ●</li><li>• Network Administration and Maintenance ●</li><li>• Network Configuration and Troubleshooting ●</li><li>• Cloud Computing ●</li></ul> | <ul style="list-style-type: none"><li>• Infrastructure Design</li><li>• Infrastructure Strategy</li><li>• Network Slicing ●</li><li>• Network System Planning and Design ●</li></ul>   | <p><b>1. Network Operations and Management: Network Manager</b></p> <p>Oversee the design, implementation, and maintenance of network systems to ensure reliable, secure, and efficient connectivity.</p>                                       |
| <ul style="list-style-type: none"><li>• Incident Response</li><li>• Prompt Engineering</li></ul>                                                                                                                 | <ul style="list-style-type: none"><li>• Cybersecurity Basics ●</li><li>• Cybersecurity Framework Application ●</li><li>• Cyber Risk Management ●</li></ul>                             | <p><b>2. Security Services: Cyber Risk Manager</b></p> <p>Oversee risk assessments and controls implementation, manage regulatory inquiries and audits, and ensure cyber security standards, policies align with organisational objectives.</p> |
| <ul style="list-style-type: none"><li>• Cloud Computing ●</li><li>• Prompt Engineering</li></ul>                                                                                                                 | <ul style="list-style-type: none"><li>• Solution Architecture ●</li><li>• Software Design and Development ●</li><li>• Solutions Design Thinking ●</li><li>• Systems Design ●</li></ul> | <p><b>3. Platform and Solution Services: Solution Architect</b></p> <p>Design and implement complex technical solutions to meet business needs, ensuring scalability, efficiency, and seamless integration.</p>                                 |
| <ul style="list-style-type: none"><li>• Stakeholder Management</li><li>• Prompt Engineering</li><li>• Data Collection and Analytics ●</li></ul>                                                                  | <ul style="list-style-type: none"><li>• Big Data Analytics ●</li><li>• Data Storyboarding ●</li><li>• Customer Experience Design</li><li>• Customer Experience Management</li></ul>    | <p><b>4. Customer Services and Support: Customer Experience Manager</b></p> <p>Develop and implement strategies to improve customer experience, manage customer service teams, and analyse feedback to enhance satisfaction and loyalty.</p>    |



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#05

Platform Solution and Services: Applications Support Engineer

The role faces significant disruption as Continuous Integration and Continuous deployment (CI/CD) pipelines increasingly automate core tasks such as testing, deployment, and monitoring.

**Job Purpose:**

- Ensure software reliability and user support through testing, maintenance, and troubleshooting.

| AI                                                                                                                                                                        | DIGITAL SKILLS                                                                                                                                                      | GREEN SKILLS                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI can assist in monitoring application performance and flagging issues.</p>                                               | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools can automate and streamline application monitoring, routine maintenance, and onboarding processes.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential because environmental requirements do not alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Human intervention is needed only for troubleshooting, user support, and adapting solutions to unique software environments.</p> | <p><b>Low Human Intervention:</b></p> <p>Human input is limited complex problem-solving and software transitions.</p>                                               | <p><b>High Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                   |

**Case Study**

**Auxis<sup>90</sup>**

Auxis, a management consulting firm, supported a global leader in cloud infrastructure and business mobility in transforming its application management through automated testing and a CI/CD pipeline. The integration enabled early issue detection, reducing manual debugging and downtime, while streamlining deployments and automating repetitive tasks. This not only improved consistency and quality but also freed engineers to focus on innovation and system enhancements.

90.Auxis. (2024). Test Automation Case Study. Auxis Case Studies. <<https://www.auxis.com/case-study/test-automation-case-study/>>

Upskilling and Reskilling

Potential Career Pathways

Transferable Skills\*

- Applications Development ●
- Applications Integration ●
- Applications Support and Enhancement ●
- Application Programming Interface (API) Management ●

Additional Skills\*

- Solution Architecture ●
- DevOps ●
- Emerging Technology Synthesis ●
- Continuous Integration and Continuous Deployment (CI/CD) ●

Possible Roles for Transition Within the Sector

**1. Platform and Solution Services: Application Engineer**

Develop and optimise software for reliable communication services.

**2. Platform and Solution Services: Software Engineer**

Develop and maintain high-quality software solutions by designing, testing, and optimising code for performance.

**3. Platform and Solution Services: System Support Engineer**

Maintaining, troubleshooting, and supporting the infrastructure and software systems that enable communication service.

Possible Roles for Transition into Other Sectors

**4. Global Business Services: Technical Support Specialist**

Provide advanced technical support, diagnose and troubleshoot hardware and software issues; manage incidents, perform system maintenance, and support IT projects.

AI / Digital Skills

- Application Programming Interface (API) Management ●
- Software Configuration ●
- Software Testing ●
- Prompt Engineering

Green Skills

- Agile Software Development ●
- Software Design and Development ●
- Continuous Integration and Continuous Deployment (CI/CD) ●
- Containerisation and Orchestration ●
- System Performance Management ●
- Configuration Management ●
- Operating System ●
- TCP/IP and Networking Protocols ●
- Mobile Device Management
- Structured Query Language (SQL) ●
- Network and Systems Administration ●
- Network Configuration and Troubleshooting ●

\*Skills are non-exhaustive

90 Communications & Multimedia: Telecommunications, Broadcasting, and Postal and Courier

Communications & Multimedia: Telecommunications, Broadcasting, and Postal and Courier 91

# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#06

Cyber Security Services: Cybersecurity Support Engineer

The role is highly impacted as AI-driven tools now are able to automate threat detection, incident investigation, and respond to cyberattacks, reducing reliance on manual human intervention.

**Job Purpose:**

- Assist in securing networks and systems by implementing security measures, and ensuring policy compliance.

| AI                                                                                                                                                                                                | DIGITAL SKILLS                                                                                                                                                                                                        | GREEN SKILLS                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools can automate routine threat detection, log monitoring, and respond to common security alerts (e.g: phishing attempts, malware scans).</p> | <p><b>High Opportunity to Automate:</b></p> <p>Security support processes are increasingly digitalised through integrated tools such EDR (Endpoint Detection and Response), ticketing systems, and SIEM platform.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential because environmental requirements do not alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Human input is required for interpreting unusual incidents, escalating threats and supporting compliance audits.</p>                                     | <p><b>Low Human Intervention:</b></p> <p>Human involvement is limited to policy enforcement, user interaction, security awareness, and documentation.</p>                                                             | <p><b>High Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                   |

Case Study

**AI in Cybersecurity<sup>91</sup>**

AI is transforming cybersecurity by employing machine learning, deep learning, and neural networks to detect threats, identify patterns, and predict attacks before they occur. Key applications include identity and access management, cloud security, information protection, and automated incident response – functions that were once the core responsibility of Cybersecurity Support Engineers. As these tasks become increasingly automated, the demand for manual support in such roles is expected to decline.

91.Aristek Systems. (2024). Role of AI in Cybersecurity: Use Cases, Benefits and Tools. Medium. <<https://medium.com/@aristeksystems/role-of-ai-in-cybersecurity-use-cases-benefits-and-tools-4050a1f2baba>>

| Upskilling and Reskilling                                                                                                                                                |                                                                                                                                                                                           | Potential Career Pathways                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                     | Additional Skills*                                                                                                                                                                        | Possible Roles for Transition Within the Sector                                                                                                                                                   |
| <ul style="list-style-type: none"><li>Cybersecurity Basics ●</li><li>Cybersecurity Framework Application ●</li><li>Cyber Risk Management ●</li></ul>                     | <ul style="list-style-type: none"><li>Cyber Incident Management ●</li><li>Threat Analysis and Defense ●</li><li>Security Architecture ●</li><li>Security Strategy</li></ul>               | <p><b>1. Security Services: Cybersecurity Specialist / Cybersecurity Engineer</b></p> <p>Design, implement, and manage robust cybersecurity measures across the telecommunications ecosystem.</p> |
| <ul style="list-style-type: none"><li>Cybersecurity Basics ●</li><li>Threat Intelligence and Detection</li><li>Incident Response ●</li><li>Operating Systems ●</li></ul> | <ul style="list-style-type: none"><li>Cyber Incident Management ●</li><li>Security Information and Event Management (SIEM) ●</li><li>Incident Reporting</li></ul>                         | <p><b>2. Security Services: SOC Analyst</b></p> <p>Monitor, analyse, and respond to security threats and incidents in a Security Operations Centre (SOC).</p>                                     |
| <ul style="list-style-type: none"><li>Cybersecurity Basics ●</li><li>Threat Intelligence and Detection</li><li>Incident Response</li><li>Operating Systems ●</li></ul>   | <ul style="list-style-type: none"><li>Cyber Forensics ●</li><li>Security Information and Event Management (SIEM) ●</li><li>Incident Reporting</li><li>Root Cause Analysis (RCA)</li></ul> | <p><b>3. Security Services: SOC Incident Investigator</b></p> <p>Analyse and respond to security incidents to protect network integrity and ensure data security.</p>                             |



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#07

Customer Services and Support  
Customer Service Representative

The role has significant potential for automation as AI-driven customer services systems automate routine inquiries and issue resolution, significantly reducing the need for manual intervention of a Customer Service Representative.

Job Purpose:

- Provide exceptional support and assistance to customers to enhance overall customer satisfaction.

| AI                                                                                                                                                                                                                                                                                                                                | DIGITAL SKILLS                                                                                                                                                                                                                                                                                                                                                                    | GREEN SKILLS                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b><br/>AI tool can automate FAQs, manage routine queries, conduct sentiment analysis, and provide basic customer support via chatbots or voice assistants.</p> <p><b>Low Human Intervention:</b><br/>Human input is needed for resolving complex issues, or conflict-prone interactions.</p> | <p><b>High Opportunity to Automate:</b><br/>Digital tools such as CRM platforms, automated ticketing systems, and omnichannel support solutions can streamline customer interactions.</p> <p><b>Low Human Intervention:</b><br/>Human representatives are needed to only manage escalations, understand context, and tailor support services to serve diverse customer needs.</p> | <p><b>Low Environmental Impact on the Role:</b><br/>This role remains essential because environmental requirements do not alter its core job functions.</p> <p><b>High Opportunity to Diversify:</b><br/>There is limited opportunity for this role to diversify.</p> |



Case Study

SK Telecom<sup>92</sup>

SK Telecom has introduced a beta version of its AI-powered Customer Service Support System, built on its proprietary large language model and multimodal AI to enhance efficiency and improve customer experiences. The system features three (3) core innovations: AI-driven Knowledge Search Assistance, Intelligent Document Processing, and an Automated Post-Processing System for consultation outcomes. By leveraging Retrieval-Augmented Generation (RAG), it delivers more accurate, real-time responses by sourcing and integrating information from trusted data sources.

92.TelecomTV. (2024). SK Telecom to Introduce AI-Powered Customer Service Using Proprietary Telco LLM and LMM. TelecomTV Content. <<https://www.telecomtv.com/content/telcos-and-ai-channel/sk-telecom-to-introduce-ai-powered-customer-service-using-proprietary-telco-llm-and-lmm-51789/>>

| Upskilling and Reskilling                                                                                                                  |                                                                                                                                                                                                                             | Potential Career Pathways                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                       | Additional Skills*                                                                                                                                                                                                          | Possible Roles for Transition Within the Sector                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"><li>• Customer Relationship Management</li><li>• Product Advisory</li></ul>                              | <ul style="list-style-type: none"><li>• Customer Profiling</li><li>• Market Profiling</li><li>• Sales Strategy and Execution</li><li>• Sales Target Management</li></ul>                                                    | <p><b>1. Security Services: Sales Executive / Account Executive</b><br/>Drive revenue by identifying sales opportunities and building client relationships.</p>                                                                                                                             |
| <ul style="list-style-type: none"><li>• Customer Relationship Management</li><li>• Product Advisory</li><li>• Service Excellence</li></ul> | <ul style="list-style-type: none"><li>• Product Demonstration</li><li>• Sales Strategy and Execution</li><li>• Customer Profiling</li><li>• Consumer Sustainability Education ●</li></ul>                                   | <p><b>2. Wholesale and Retail Trade: Customer Service Representative</b><br/>Assist customers by addressing inquiries and resolving issues, ensuring positive interactions and timely solutions.</p>                                                                                        |
| <ul style="list-style-type: none"><li>• Customer Relationship Management</li></ul>                                                         | <ul style="list-style-type: none"><li>• Case Evaluation and Risk Assessment</li><li>• Reporting and Documentation</li><li>• Knowledge of Contract Law and Dispute Clauses</li><li>• Legal and Regulatory Research</li></ul> | <p><b>Possible Roles for Transition into Other Sectors</b></p> <p><b>1. Global Business Services: Dispute Resolution Specialist</b><br/>Investigate and resolve customer disputes, collaborate with internal teams, maintain accurate records, and develop dispute resolution policies.</p> |

# Medium and Low Impacted Roles Analysis



## Medium Impacted Roles

This impact study revealed that 52% of roles in the Telecommunications sector are categorised as medium-impacted, reflecting their operational focus and the need to adapt to evolving technology and sustainability trends. While these roles are less vulnerable to full automation, they still require continuous upskilling to keep pace with advancements in AI, Digital, and Green Economy practices and remain agile and capable of supporting the sector’s transformation.

### On-Demand Skills Analysis for 76 Medium Impacted Roles

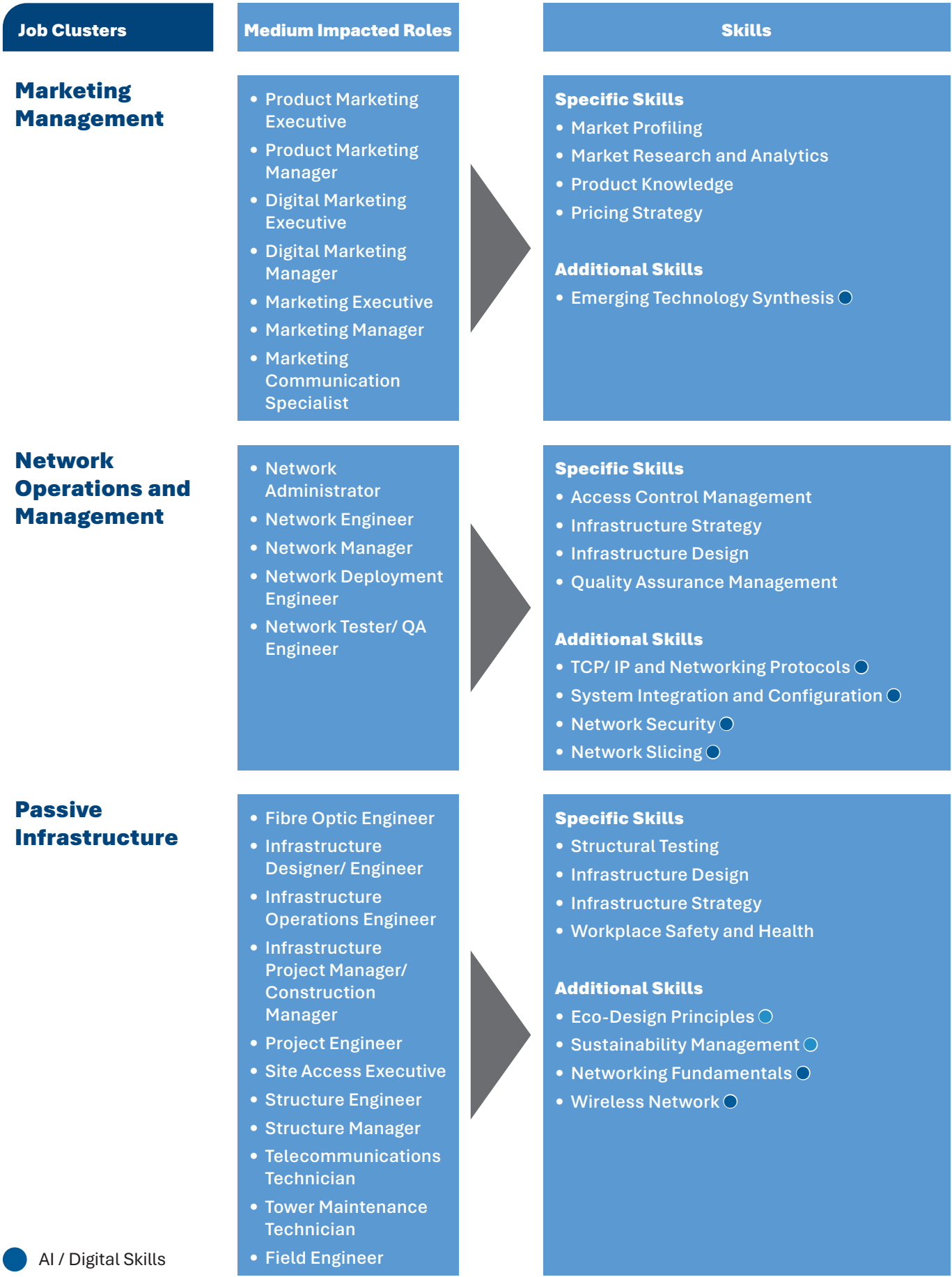
| Job Clusters   | Medium Impacted Roles                                                                                                                                                                                                                                                                              | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Access Network | <ul style="list-style-type: none"><li>• Access Network Designer/ Planner</li><li>• Access Network Engineer</li><li>• Access Network Technician</li><li>• RAN Engineer</li><li>• RF Engineer/ RF Specialist</li><li>• RAN/RF Manager</li><li>• DAS Engineer</li><li>• 5G Systems Engineer</li></ul> | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>• Infrastructure Strategy</li><li>• Infrastructure Deployment</li><li>• Infrastructure Design</li><li>• Quality Control and Assurance</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>• Network Configuration and Troubleshooting</li><li>• Radio Frequency Engineering</li><li>• Waste Management</li><li>• Sustainable Business Practices</li></ul></div> |
| Cloud Network  | <ul style="list-style-type: none"><li>• Cloud Developer</li><li>• Cloud Engineer</li><li>• Cloud Analyst</li><li>• Cloud FinOps Engineer</li></ul>                                                                                                                                                 | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>• Root Cause Analysis (RCA)</li><li>• Cost Management</li><li>• Prompt Engineering</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>• DevOps</li><li>• Programming, Coding and Scripting</li><li>• Infrastructure as Code (IaC)</li><li>• Containerisation and Orchestration</li></ul></div>                                                                 |
| Core Network   | <ul style="list-style-type: none"><li>• Core Network Engineer</li><li>• Core Network Manager</li></ul>                                                                                                                                                                                             | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>• Infrastructure Strategy</li><li>• Infrastructure Deployment</li><li>• Infrastructure Design</li><li>• Quality Control and Assurance</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>• Network Configuration and Troubleshooting</li><li>• Network Automation</li><li>• Network Security</li><li>• Big Data Analytics</li></ul></div>                      |

- AI / Digital Skills
- Green Skills





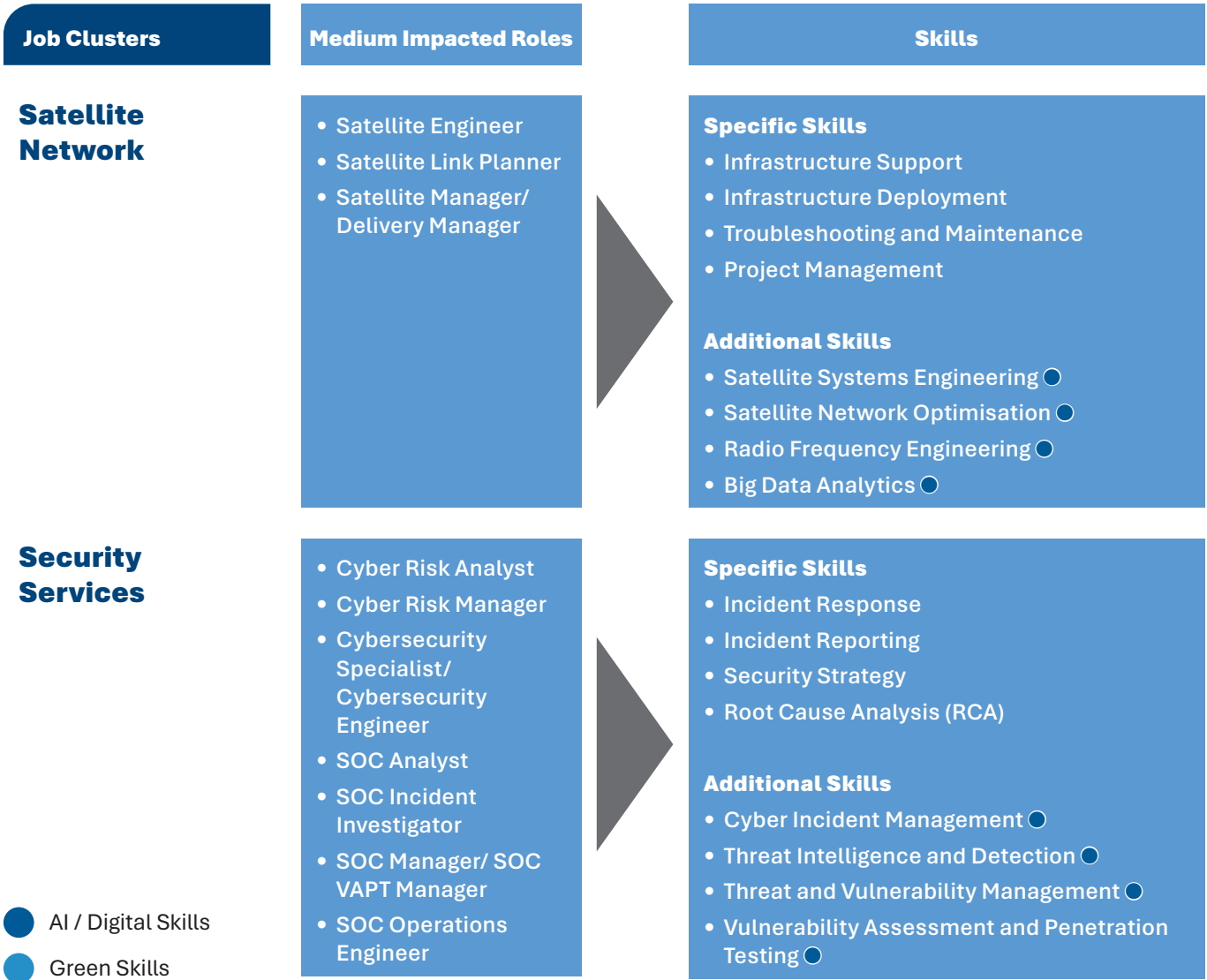
- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills





Example: Illustration of Medium Impacted Roles

Medium impacted Role

#01

Security Services: SOC Analyst

| Roles                                                                                                                                                                                                            | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><b>SOC Analyst</b><div><b>Job Purpose:</b><ul style="list-style-type: none"><li>Monitor, analyse and respond to security threats and incidents in a Security Operations Centre (SOC).</li></ul></div></div> | <div><b>AI / Digital Skills</b><div><b>1. Security Information and Event Management (SIEM)</b><p>Proficiency in monitoring and managing security events in real-time to detect threats, respond to incidents, and safeguard the security of information systems.</p></div><div><b>2. Cyber Incident Management</b><p>Ability to detect and report incident, identify affected systems and user groups, trigger alerts and announcements to relevant stakeholders, and ensure efficient resolution of situations.</p></div></div> <div><b>Green Skills</b><div><b>1. Sustainability Awareness</b><p>Understand principles of sustainable development and the ramification of ESG on the organisation.</p></div></div> |



**Case Study**

**Check Point<sup>93</sup>**

Check Point has adopted Torq’s AI-driven HyperSOC platform to ease the burden on its SOCs. The system automates repetitive tasks such as investigating, triaging, and resolving routine alerts, while executing predefined actions such as triggering multi-factor authentication or locking suspicious accounts. For more complex cases, the platform alerts and recommends potential next steps. By streamlining routine work and prioritising critical threats, AI allows SOC Analysts to focus on high-value investigations, improving response times and reducing the risk of missed incidents.

93. TechTarget. (2024). How AI-driven SOC tech eased alert fatigue: Case study. SearchSecurity. <<https://www.techtarget.com/searchsecurity/feature/How-AI-driven-SOC-tech-eased-alert-fatigue-Case-study>>

Medium impacted Role

#02

Passive Infrastructure: Tower Maintenance Technician

| Roles                                                                                                                                                                                                                                                        | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><b>Tower Maintenance Technician</b><div><b>Job Purpose:</b><ul style="list-style-type: none"><li>Maintain communication towers and related equipment, ensuring optimal functionality and safety for reliable signal transmission.</li></ul></div></div> | <div><b>AI / Digital Skills</b><div><b>1. Networking Fundamentals</b><p>Proficiency in networking includes understanding the foundational concepts and principles of computer networking such as protocols, architectures, and network components that are essential knowledge for designing and managing contemporary network infrastructures.</p></div></div> <div><b>Green Skills</b><div><b>1. Sustainability Business Practices</b><p>Ability to execute organisational sustainable business strategies designed to balance environmental protection, social responsibility, and economic viability.</p></div><div><b>2. Waste Management</b><p>Utilise the knowledge, technical abilities, and competencies required to manage waste responsibly across its entire lifecycle, from generation to disposal or recovery.</p></div></div> |



**Case Study**

**TowerXchange Meetup MENA 2025<sup>94</sup>**

At the TowerXchange Meetup MENA 2025, industry leaders highlighted how AI and automation are reshaping tower operations. Traditional manual inspections are being replaced with AI-powered systems that enable real-time monitoring and predictive maintenance, allowing technicians to detect issues such as overheating or equipment wear before they cause failures. This proactive approach reduces unplanned downtime, streamlines repair work, and extends equipment lifespan.

Adoption has been gradual, with some tower companies hesitant due to organisational inertia and integration challenges. Yet, early adopters are already reporting significant gains in fault detection accuracy, energy efficiency, and overall asset visibility. For tower maintenance technicians, the shift to digitised systems means access to intelligent workflows, faster issue resolution, and a more proactive role in managing critical infrastructure.

94. TowerXchange. (2024). Event Report: MENA — AI-Powered Towers: Adapting or Falling Behind?. TowerXchange. <<https://www.towerxchange.com/article/2en7xq2yj3xh5j1z4eebk/event-report-mena-ai-powered-towers-adapting-or-falling-behind>>



Low Impacted Roles

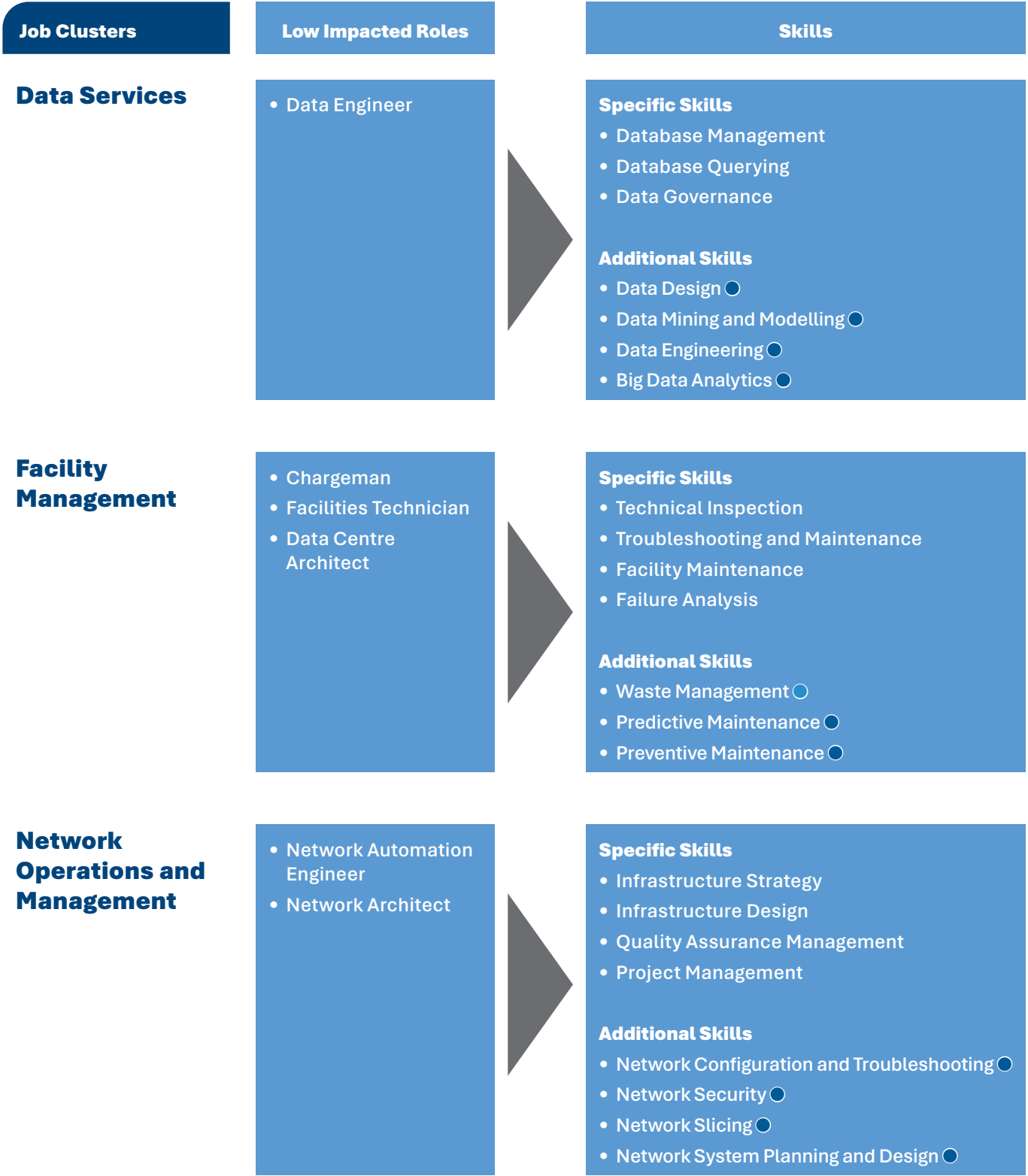
A total of 43% of roles in the Telecommunications sector are categorised as low-impacted. These roles remain less affected by AI, Digital, and Green Economy trends due to their hands-on nature, requiring significant manual intervention and on-site expertise. While technology may support efficiency, the core responsibilities of these occupations continue to depend heavily on human skill, physical presence, and situational judgement.

On-Demand Skills Analysis for 64 Low Impacted Roles

| Job Clusters                  | Low Impacted Roles                                                                                                                         | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cloud Network                 | <ul style="list-style-type: none"><li>Cloud Architect</li><li>Cloud Network Engineer/ IT Network Engineer</li></ul>                        | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Cloud Computing</li><li>Cloud Security</li><li>Cloud Architecture</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Infrastructure as Code (IaC)</li><li>Continuous Integration and Continuous Deployment (CI/CD)</li><li>Programming, Coding and Scripting</li><li>Containerisation and Orchestration</li></ul></div>                                   |
| Core Network                  | <ul style="list-style-type: none"><li>Core Network Architect</li></ul>                                                                     | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Infrastructure Design</li><li>Infrastructure Deployment</li><li>Infrastructure Development</li><li>Quality Assurance Management</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>System Integration and Configuration</li><li>Network System Planning and Design</li><li>Network Optimisation</li></ul></div>                                           |
| Customer Services and Support | <ul style="list-style-type: none"><li>Customer Experience Manager</li><li>Customer Support Engineer (Enterprise &amp; Technical)</li></ul> | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Cost Management</li><li>Customer Relationship Management</li><li>Customer Experience Management</li><li>Service Quality Management</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>System Performance Management</li><li>Big Data Analytics</li><li>Network Configuration and Troubleshooting</li><li>TCP/ IP and Networking Protocols</li></ul></div> |

- AI / Digital Skills
- Green Skills





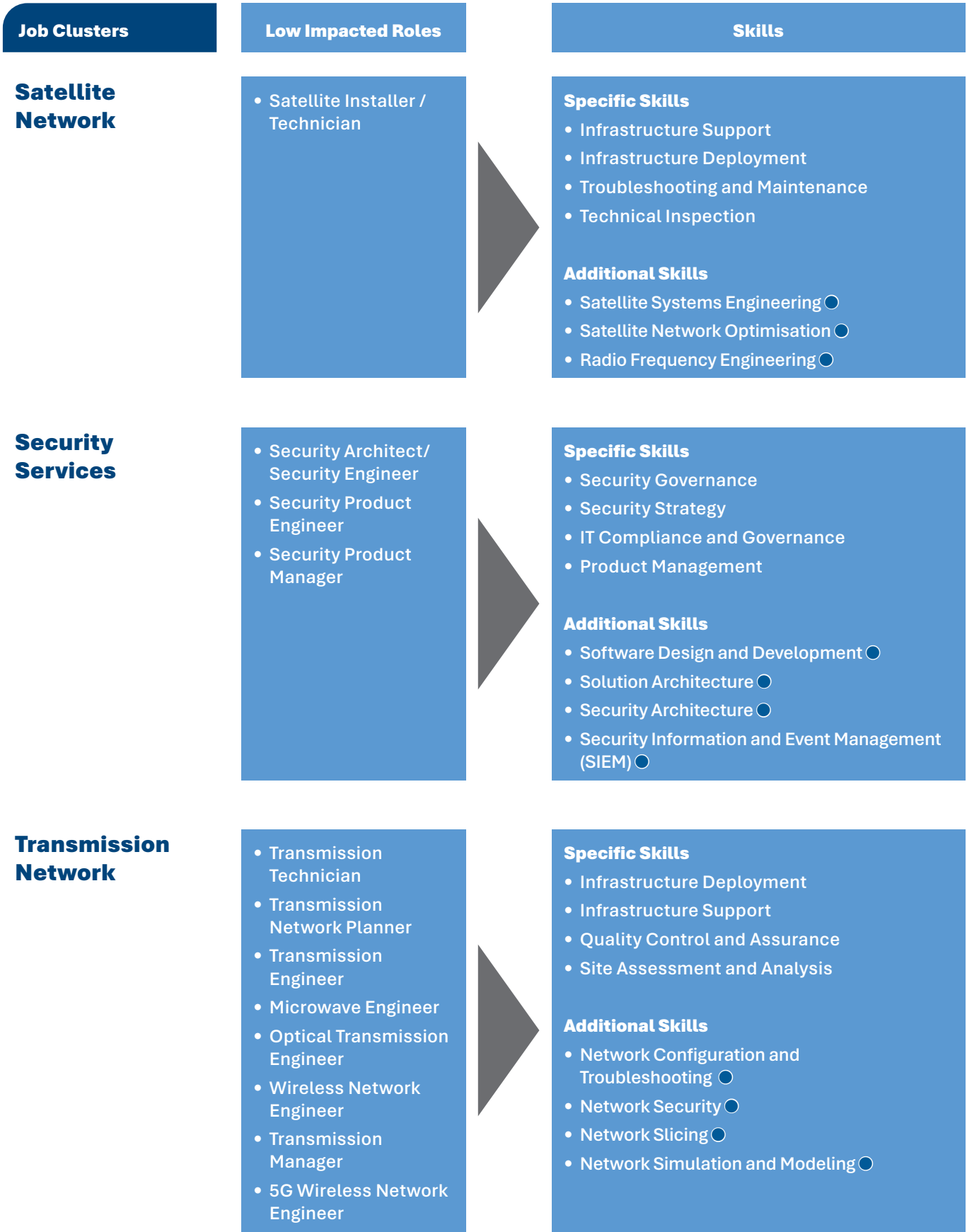
- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



Example: Illustration of Low Impacted Roles

Low impacted Role

#01

Passive Infrastructure:  
Tower Technician / Tower Climber / Tower Installer

Roles

Tower Technician / Tower Climber / Tower Installer

Job Purpose:

- Install and repair communication towers and related equipment, ensuring optimal functionality and safety for reliable signal transmission.

Additional Skills

AI / Digital Skills

1. Networking Fundamentals

Proficiency in networking includes understanding the foundational concepts and principles of computer networking, such as protocols, architectures, and network components, crucial for designing and managing contemporary network infrastructures.

Green Skills

1. Sustainable Business Practices

Execute organisational sustainable business strategies that were developed to balance environmental protection, social responsibility, and economic viability.

2. Waste Management

Utilise the knowledge, technical abilities, and competencies required to manage waste responsibly across its entire lifecycle, from generation to disposal or recovery.

Case Study

Verizon and AT&T<sup>95</sup>

As major carriers such as Verizon and AT&T accelerate their 5G rollout, infrastructure partners such as Ericsson are playing a central role in enabling this expansion. Meeting these demands has intensified the need for tower climbers - specialists responsible for scaling towers, installing hardware, and assembling critical equipment. Unlike many roles being reshaped by AI and automation, these hands-on tasks remain firmly reliant on human expertise and physical skill, underscoring the indispensable role of tower technicians in building and sustaining next-generation networks.

95.CNBC. (2019). The drive to make 5G a reality has led to a surge in demand for tower climbers. CNBC. <<https://www.cnbc.com/2019/05/03/the-drive-to-make-5g-a-reality-has-led-to-a-surge-in-demand-for-tower-climbers.html>>

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Low impacted Role

#02

Sales Management:  
Product Sales Specialist

Roles

Product Sales Specialist

Job Purpose:

- Drive sales growth by leveraging in-depth product knowledge to identify customer needs and deliver tailored telecommunications solutions.

Additional Skills

AI / Digital Skills

1. Digital and AI Fluency

Understand and effectively utilise various digital platforms and tools, such as online collaboration tools and application of AI capabilities, to solve problems and drive efficiency across tasks and processes.

Green Skills

1. Sustainability Awareness

Understand principles of sustainable development and the ramification of ESG goals and principles on the organisation.

Case Study

Balancing Emotional Intelligence with AI<sup>96</sup>

AI is reshaping the role of Product Sales Specialists, offering powerful tools to analyse customer data, personalise outreach, and streamline sales processes. Yet, while AI can enhance efficiency and provide insights, it cannot replace the empathy, trust-building, and situational awareness that define effective human interaction. Buyers increasingly seek seamless, sometimes seller-free experiences, but many remain cautious about AI-led engagement. The most effective approach blends AI’s analytical power with human emotional intelligence, ensuring personalised, trustworthy, and transparent sales experiences. For sales specialists, this balance is key – positioning AI as a support tool that empowers, rather than replaces, their role.

96.Forbes Business Council. (2024). The Human Touch In Sales: Balancing Emotional Intelligence With AI. Forbes. <<https://www.forbes.com/councils/forbesbusinesscouncil/2024/02/22/the-human-touch-in-sales-balancing-emotional-intelligence-with-ai/>>

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In-Demand Skills for AI, Digital, and Green Economy

Training Programmes Available

Essential AI and Digital skills for roles to adopt for business operations enhancements and overall workforce productivity improvements.

List of proposed training programmes are accessible on the MyMAHIR platform.

- AI/ Digital Skills
- Big Data Analytics

DevOps

Networking Fundamentals

Network Security

Radio Frequency Engineering

TCP / IP and Networking Protocols

- Green Skills
- Eco-Design Principles

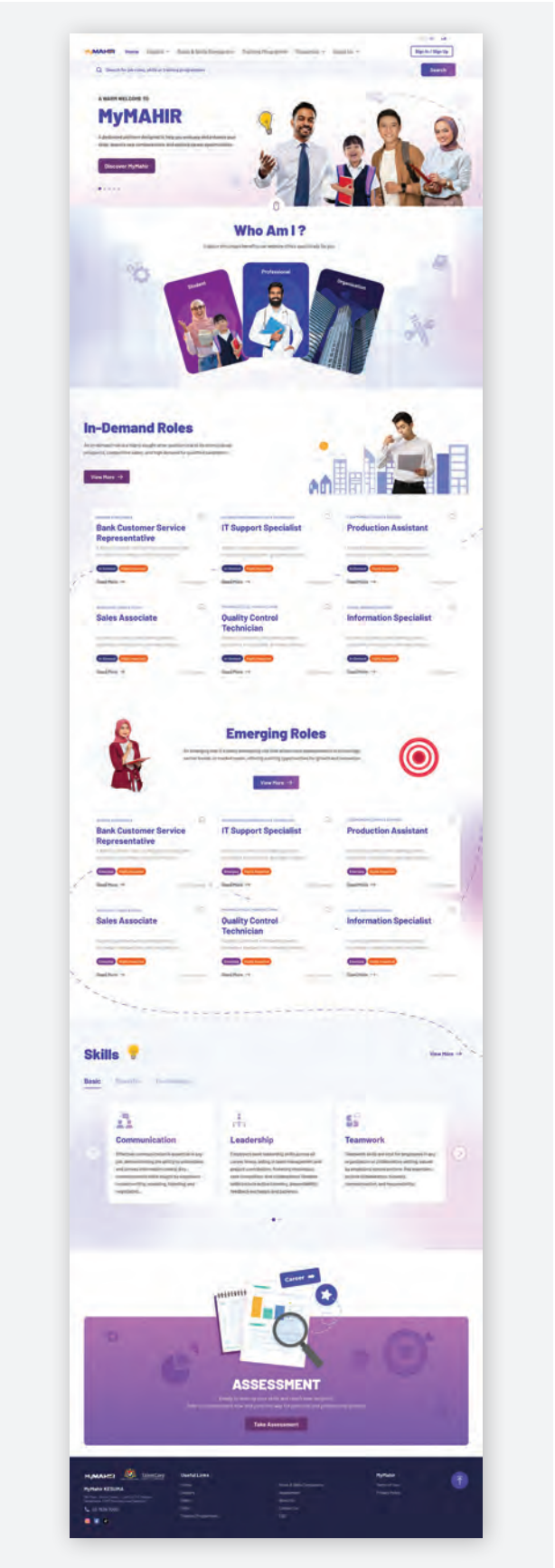
Eco-Friendly Site Selection

Green Energy Integration

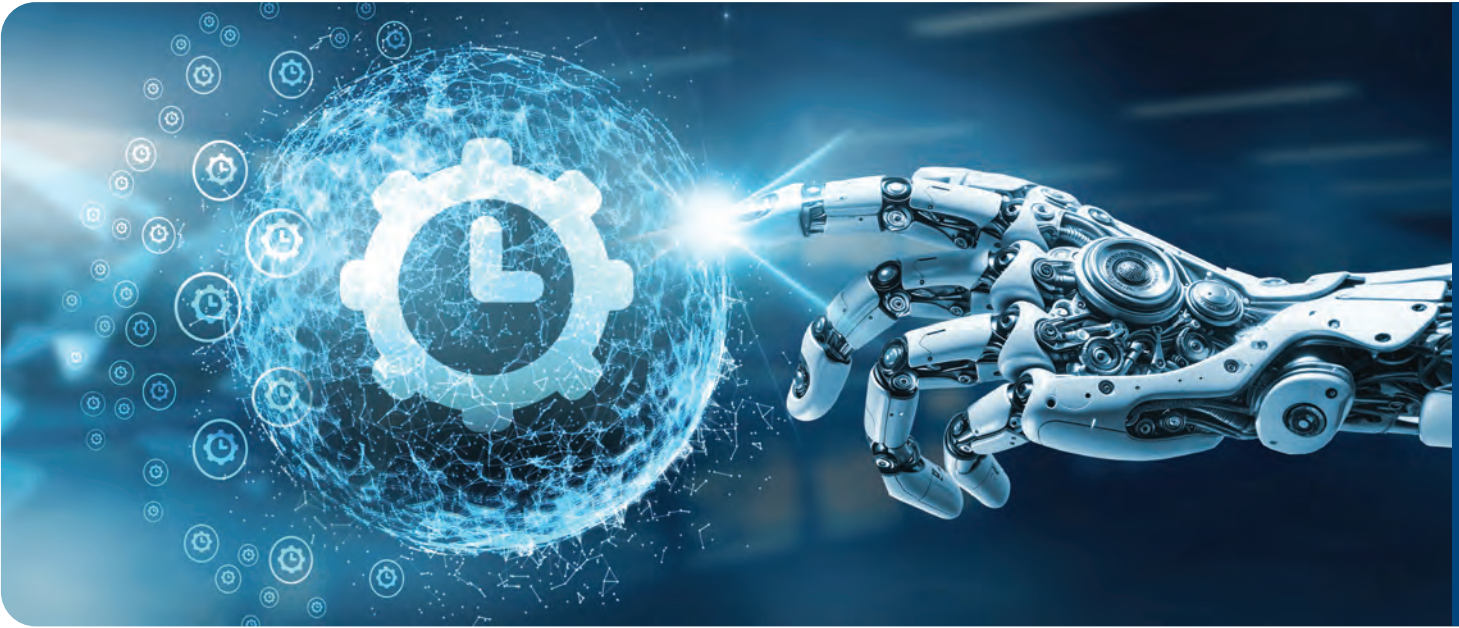
Sustainability Management

Sustainable Business Practices

Waste Management



# Emerging Roles



The future of Malaysia’s Telecommunications sector is being shaped by the accelerating forces of AI, digitalisation, and advanced connectivity. As the nation deepens its transition into a high-tech, data-driven economy, new roles are emerging to meet the evolving demands of next-generation networks, intelligent systems, and responsible innovation. These roles are not only a response to technological disruption but also reflect the sector’s need to maintain competitiveness, resilience, and public trust in a rapidly digitalising world.

Technological advancements in AI and edge computing are central to this transformation, enabling real-time decision-making, predictive intelligence, and high-performance connectivity across industries. Emerging roles such as AI Engineer are critical to designing and optimising intelligent systems, while Edge Computing Specialists ensure that data is processed efficiently at the network edge to support latency-sensitive applications in healthcare, smart cities, and autonomous mobility. At the same time, increasing public scrutiny on privacy, security, and responsible AI use has created demand for the AI Ethics Officer, a role dedicated to safeguarding transparency, accountability, and trust in AI deployment across the sector.

Together, these emerging roles highlight how Malaysia’s telecommunications workforce is evolving to align innovation with ethical governance and technological excellence. By cultivating these skill sets, the sector is positioning itself at the forefront of global digital transformation, ensuring that future connectivity is not only faster and smarter but also responsible and inclusive.

The study has identified three (3) integral emerging roles that are shaping the future of the Telecommunications sector:

Overview of Three (3) Emerging Roles in Telecommunications Sector

AI Engineer

- Build AI solutions that optimise operational efficiency and enhance customer experience.

AI Ethics Officer

- Ensure responsible AI use by setting guidelines, managing risks, and fostering ethical culture.

Edge Computing Specialist

- Develop and manage edge computing solutions.



Emerging Roles

#01

AI Engineer

This role is responsible for building smart and scalable AI-driven telecommunications solutions to drive operational efficiency and enhance customer experience.

| Global Emerging Trends                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Key Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>AI:</b></p> <p>AI technologies including model development and AI co-pilots/agents are gaining traction for automating tasks and enhancing operational efficiency.</p> <p>.....</p> <p><b>Digital:</b></p> <p>Digital tools such as CI/CD tools and data management systems enable efficient model deployment, pipeline management, and metadata management.</p> <p>.....</p> <ul style="list-style-type: none"><li>•The growing use of reinforcement learning, intelligent agents, and low-latency AI model deployment will significantly increase the demand for AI engineers.</li><li>•Network Operations Centers (NOC) and Security Operations Centers (SOC) are increasingly adopting AI technologies to automate monitoring, threat detection, and incident response.</li></ul> | <ul style="list-style-type: none"><li>• Build AI-driven systems for self-optimising, self-healing, and self-configuring networks (SON).</li><li>• Process large volumes of real-time data from base stations, core, and edge to extract actionable insight.</li><li>• Collaborate with ML engineers to integrate supervised/unsupervised learning models for predictions.</li><li>• Continuous supervision of the AI system performance, retraining and refining logic as needed.</li><li>• Staying informed of the latest AI advancement and assess their relevance to the Telecommunications sector.</li></ul> | <p><b>Basic Skills</b></p> <ul style="list-style-type: none"><li>• Adaptability and Resiliency</li><li>• Business Acumen</li><li>• Change Management</li><li>• Coaching and Mentoring</li><li>• Cognitive Skills</li><li>• Communication</li><li>• Conflict Management</li><li>• Critical Thinking</li><li>• Digital and AI Fluency</li><li>• Empathy</li><li>• Influencing and Negotiation</li><li>• Innovative Thinking</li><li>• Learning Agility</li><li>• Planning and Organising</li><li>• Sustainability Awareness ●</li><li>• Teamwork and Collaboration</li></ul> <p><b>Specific Skills</b></p> <ul style="list-style-type: none"><li>• Artificial Intelligence Application ●</li><li>• Artificial Intelligence Deployment ●</li><li>• Artificial Intelligence Management ●</li><li>• Big Data Analytics ●</li><li>• Cloud Computing ●</li><li>• Data Modeling and Design ●</li><li>• Data Visualisation ●</li><li>• Machine Learning ●</li><li>• Natural Language Processing ●</li><li>• Networking Fundamentals ●</li><li>• Programming, Coding and Scripting ●</li><li>• TCP/IP and Networking Protocols ●</li></ul> |



Case Studies

AI Engineer – Driving Intelligent Telecommunications<sup>97</sup>

AI is already being applied across multiple dimensions of the telecommunications business. Models that assess customer behaviour, usage patterns, and network performance allow providers to predict churn risks and intervene proactively. At the same time, AI enables customer segmentation based on preferences and behaviours, supporting personalised marketing, targeted offers, and customised plans that drive engagement. Beyond customer-facing applications, AI also enhances revenue strategies through dynamic pricing models, which optimise tariffs by analysing network demand and user activity in real time. By embedding AI into networks and services, providers can cut inefficiencies, enhance customer experiences, and unlock new revenue streams, making AI Engineers pivotal to the future of intelligent, data-driven telecommunications operations.

97. UST. (2024). Data-Driven Connectivity: The Rise of AI and Machine Learning in Telecommunications. UST Insights. <<https://www.ust.com/en/insights/data-driven-connectivity-the-rise-of-ai-and-machine-learning-in-telecommunications>>



Emerging Roles

#02

AI Ethics Officer

An AI Ethics Officer ensures ethical use of artificial intelligence amidst the growing adoption of AI technologies by establishing guidelines for the development and deployment of AI systems. This role is also responsible for managing potential ethical risks, and cultivates an ethical culture AI usage among employees and stakeholders.

| Global Emerging Trends                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Key Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>AI:</b></p> <p>AI-driven tools such as ChatGPT and autonomous decision-making systems are increasingly engaged to boost operational efficiency and guide decision-making process.</p> <ul style="list-style-type: none"><li>• AI often requires massive amounts of personal data, which may cause concerns regarding the surveillance and security of the data.</li><li>• A robust data governance framework is necessary to enforce strict privacy protection to safeguard telecommunications organisations’ assets and maintain public trust.</li></ul> | <ul style="list-style-type: none"><li>• Create and implement ethical guidelines and policies for the development and deployment of AI systems within an organisation.</li><li>• Ensure AI practices comply with relevant laws, regulations, and industry standards.</li><li>• Identify and assess potential ethical risks associated with AI technologies.</li><li>• Lead investigations into ethical concerns or incidents related to AI systems and provide recommendations for corrective actions.</li><li>• Build an ethical culture by raising awareness and understanding of AI ethics among employees and stakeholders.</li></ul> | <p><b>Basic Skills</b></p> <ul style="list-style-type: none"><li>• Adaptability and Resiliency</li><li>• Business Acumen</li><li>• Change Management</li><li>• Coaching and Mentoring</li><li>• Cognitive Skills</li><li>• Communication</li><li>• Conflict Management</li><li>• Critical Thinking</li><li>• Digital and AI Fluency ●</li><li>• Empathy</li><li>• Influencing and Negotiation</li><li>• Innovative Thinking</li><li>• Learning Agility</li><li>• Planning and Organising</li><li>• Sustainability Awareness ●</li><li>• Teamwork and Collaboration</li></ul> <p><b>Specific Skills</b></p> <ul style="list-style-type: none"><li>• Artificial Intelligence Ethics and Governance ●</li><li>• Data Privacy and Security</li><li>• Knowledge of Artificial Intelligence ●</li><li>• Knowledge of Legal and Compliance</li><li>• Machine Learning ●</li><li>• Regulatory Compliance</li><li>• Regulatory Risk Assessment</li><li>• Risk Management</li></ul> |



Case Studies

AI Ethics Officer – Embedding Ethical Principles in Technology<sup>98</sup>

AI is driving innovation in telecommunications by optimising networks, personalising services, and enhancing customer experience. However, it also raises ethical risks. Biased data can lead to unfair outcomes, and misuse of customer data can quickly undermine trust and reinforce inequality. Ethical concerns are no longer abstract as they directly affect customer rights, regulatory compliance and reputation of providers.

The AI Ethics Officer ensures responsible use of AI across the organisation, including embedding ethical principles in system design, setting governance frameworks, managing risks and guiding developers to align with fairness, transparency, and accountability standards. Global players such as IBM, Microsoft, and Salesforce have already appointed similar roles, recognising that AI’s future depends not just on technical capabilities, but on responsible and ethical deployment. This role protects both the organisation and its customers, making it vital for a sector that operates at the intersection of technology, trust, and society.

98. World Economic Forum. (2021). How AI ethics is creating new jobs. WEF Stories. <<https://www.weforum.org/stories/2021/09/artificial-intelligence-ethics-new-jobs/>>



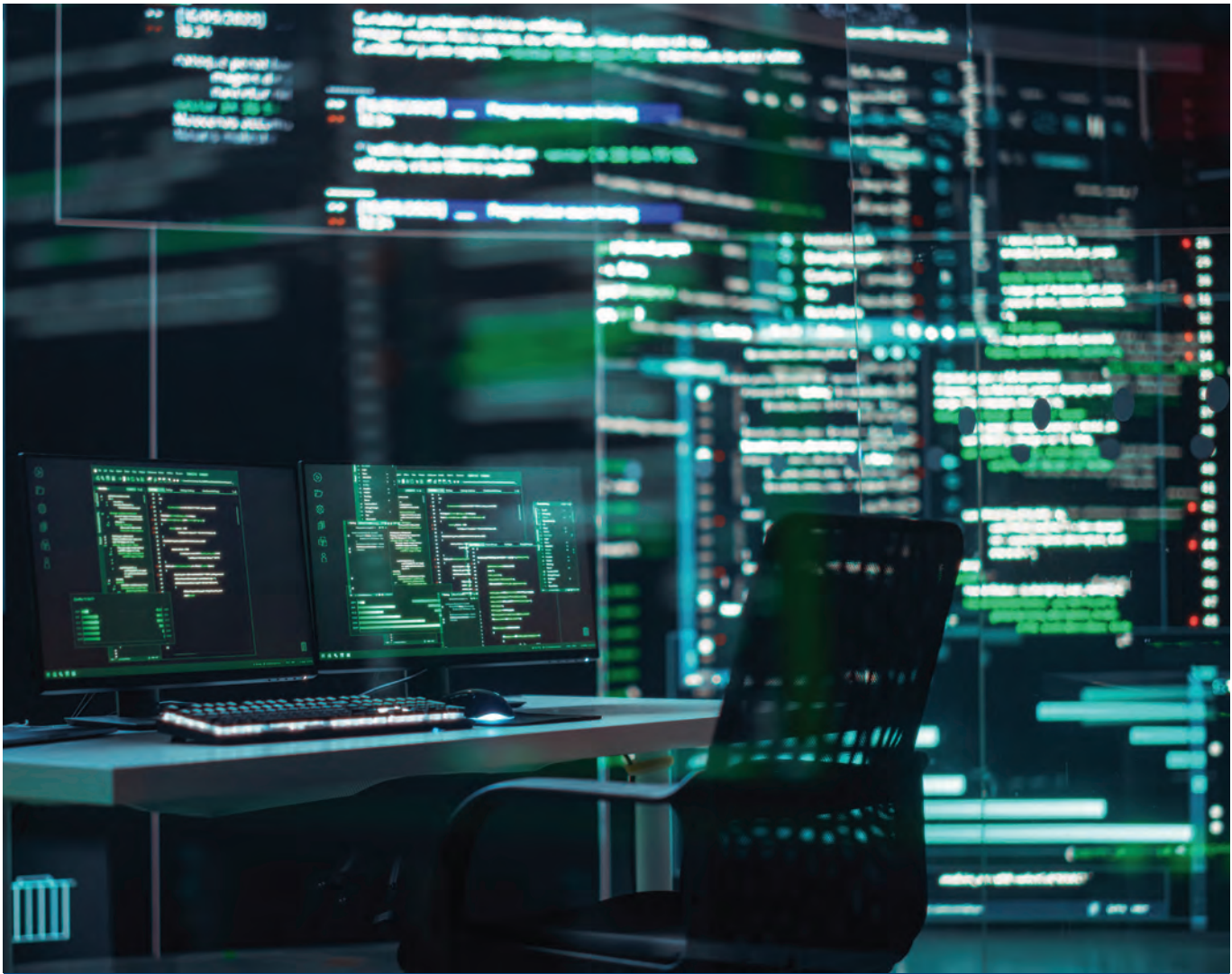
Emerging Roles

#03

Edge Computing Specialist

An Edge Computing Specialist is a vital role for advancing 5G, IoT technologies as well as the future of telecommunications. These specialists develop and manage solutions that bring computing power closer to data sources for real-time processing and minimal latency.

| Global Emerging Trends                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Key Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>AI:</b><br/>AI models are moving to the edge for faster, smarter, and more autonomous decision-making.</p> <p><b>Digital:</b><br/>Edge systems are evolving with 5G, cloud integration, and stronger security for real-time operations.</p> <ul style="list-style-type: none"><li>• The growing demand for real-time, low-latency intelligence is accelerating the deployment of lightweight AI models and federated learning on edge devices, enabling smarter and more autonomous decision-making closer to the data source.</li><li>• Advancements in connectivity, orchestration, and security, such as 5G, cloud-to-edge integration, and zero trust architectures, are transforming edge infrastructure into a flexible, scalable, and secure digital ecosystem.</li></ul> | <ul style="list-style-type: none"><li>• Design and implement edge computing architectures for low-latency applications.</li><li>• Develop and optimise applications to run efficiently at the edge; balancing compute, storage, and network constraints.</li><li>• Collaborate with AI/ML team to deploy models at the edge for real-time interference.</li><li>• Ensure seamless integration of edge infrastructure with existing core network and cloud platforms.</li><li>• Evaluate emerging edge computing technologies and frameworks.</li></ul> | <p><b>Basic Skills</b></p> <ul style="list-style-type: none"><li>• Adaptability and Resiliency</li><li>• Business Acumen</li><li>• Change Management</li><li>• Coaching and Mentoring</li><li>• Cognitive Skills</li><li>• Communication</li><li>• Conflict Management</li><li>• Critical Thinking</li><li>• Digital and AI Fluency ●</li><li>• Empathy</li><li>• Influencing and Negotiation</li><li>• Innovative Thinking</li><li>• Learning Agility</li><li>• Planning and Organising</li><li>• Sustainability Awareness ●</li><li>• Teamwork and Collaboration</li></ul> <p><b>Specific Skills</b></p> <ul style="list-style-type: none"><li>• Cloud Computing ●</li><li>• Containerisation and Orchestration ●</li><li>• Cybersecurity Basics ●</li><li>• Cybersecurity Management ●</li><li>• Edge Computing ●</li><li>• Internet of Things Management ●</li><li>• Machine Learning ●</li><li>• Programming, Coding and Scripting ●</li><li>• Systems Design ●</li><li>• TCP/IP and Networking Protocols ●</li></ul> |



Case Study

Edge Computing Specialists – Leading the Future of Telecommunications<sup>99,100</sup>

Edge computing is becoming a cornerstone of 5G networks, reducing latency and easing network traffic by processing data closer to its source. This shift modernises networks, reduces reliance on centralised clouds, and enables real-time applications such as augmented reality, industrial IoT, and smart city management. By moving processing to local hubs, edge computing eases the load on core networks, boosts performance, cuts costs, and improves service quality. It also strengthens security and reliability by minimising risks during data transfer. For telecommunications providers, this unlocks new business opportunities in specialised services like ultra-low-latency gaming and connected infrastructure.

As a cloud-native innovation, edge computing is transforming how networks operate and deliver value. Demand for these solutions is set to surge through 2030, especially with the growth of AI, extended reality, and other real-time applications—making the role of Edge Computing Specialist increasingly critical.

99. Telecom Magazine. (2024). Edge Computing in Telecoms: Revolutionising 5G Networks. Telecom Articles. <<https://telcommagazine.com/articles/edge-computing-in-telecoms-revolutionising-5g-networks>>

100. SUSE. (2024). 5 Ways Edge Computing is Revolutionizing Telecommunications. SUSE Insights. <<https://www.suse.com/c/5-ways-edge-computing-is-revolutionizing-telecommunications/>>



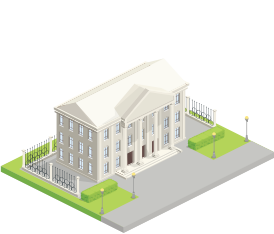
# Chapter 3.3: Recommended Initiatives

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This impact study outlines ten (10) recommended initiatives designed to address the transformative effects of AI, Digital, and Green Economy on Malaysia’s Telecommunications sector. These recommendations are structured across four (4) key stakeholder groups – Government, Industry Players, Academia, and Training Providers, to ensure a coordinated and holistic approach to workforce and technological development. By aligning efforts and resources, these initiatives aim to strengthen the sector’s adaptability, foster innovation, and ensure the Malaysian telecommunications industry remains competitive, sustainable, and prepared for future challenges and opportunities.

Summary of ten (10) Recommended Initiatives



Government

- IN1  
Launch a Future Telecommunications Talent Initiative (FTTI) Programme
- IN2  
Sustainability-Focused Talent Development in Communication
- IN3  
Synergise National Telecommunications and Digital Policy



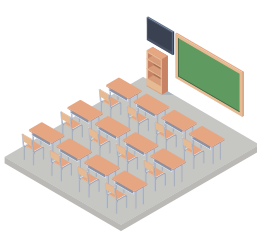
Industry Players

- IN4  
Upskill Internal Talents in Emerging Technologies
- IN5  
Embed AI in Internal Network Operations and Integrate Sustainability into System Design
- IN6  
Invest in R&D Partnerships with Universities Focused on AI, Digital, and Green Economy



Academia

- IN7  
Embed AI, Digital, and Green Economy Elements into Telecommunications Curriculum
- IN8  
Address Time-to-Talent Bottlenecks via Project-Based and Fast-Track Pathways
- IN9  
Co-Develop Capstone Projects and Living Labs with Industry Partners



Training Providers

- IN10  
Develop Training Programmes for AI, Digital, and Green Economy by Onboarding Local Skilled Talents

Government

IN1 Launch a Future Telecommunications Talent Initiative (FTTI) Programme

This initiative aims to bridge the gap between traditional telecommunications training and the evolving demands of the digital infrastructure landscape. By empowering local talents nationwide with the right skillsets such as advanced technical skills, innovative thinking, and entrepreneurial capabilities, this will ensure Malaysia remains competitive in the global tech system.

| Initiatives                                                                                                                                                                                                                                                                                                                                                            | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>IN1.1<br/>Build A Technologically Advanced Talent Pipeline</div> <div>This programme aims to build a talent pipeline that is equipped with the skills to design, deploy, and manage next-generation networks, including 5G, 6G, and satellite systems, grounded in a strong foundation in network virtualisation, edge computing, and AI-driven automation.</div> | <ul style="list-style-type: none"><li>Builds a future-ready workforce talent pool equipped for next-gen telecommunications technologies, ensuring Malaysia stays competitive in the global digital economy.</li><li>Increases job opportunities in high-demand areas like network engineering, AI-driven operations, and satellite communications.</li><li>Drives inclusive economic growth by empowering underserved communities with high-value skills, thus reducing the urban-rural digital divide.</li><li>Cultivates a new wave of entrepreneurs focused on telecommunications innovation, especially in underserved markets.</li></ul> |
| <div>IN1.2<br/>Create Career Pathways for Target Groups</div> <div>Develop inclusive pathways for rural youth, women, and TVET graduates to participate in high-value telecommunications careers through government-led modular learning programmes and targeted outreach initiatives.</div>                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <div>IN1.3<br/>Leverage Existing Fund Sharing Pools</div> <div>Encourage the development of telecommunications startups and digital infrastructure by establishing government-backed mentorship, funding, and incubation programmes, with a focus on priority areas such as rural connectivity, smart cities, and green telecommunications.</div>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Case Studies

Singapore’s TechSkills Accelerator (TeSA)<sup>102</sup>

Singapore’s TechSkills Accelerator (TeSA), developed under SkillsFuture and led by the Infocomm Media Development Authority (IMDA), was designed to build a strong ICT workforce for the country’s digital economy. The initiative includes several complementary programmes. The Company-Led Training (CLT) scheme accelerates the development of fresh graduates and mid-career professionals by providing structured, on-the-job training within leading firms. The Career Conversion Programmes (CCP) help professionals, managers, executives, and technicians acquire new skills to transition into high-growth sectors, while the Tech Immersion and Placement Programme (TIPP) enables non-ICT professionals to gain industry exposure and pivot into technology careers.

These initiatives have delivered measurable outcomes: CLT trainees gain in-depth industry experience that strengthens employability, CCP participants successfully switch careers to meet evolving manpower demands, and TIPP candidates benefit from access to industry experts and opportunities that prepare them for ICT roles. A similar FTTI in Malaysia could adopt these principles to create structured training pathways, support career transitions, and enable talent from adjacent sectors to enter the Telecommunications sector, building a resilient workforce equipped for 5G, 6G, edge computing, and AI-driven automation.

IN2 Sustainability-Focused Talent Development in Telecommunications

This initiative aims to cultivate a future-ready telecommunications workforce that combines advanced technical expertise with a strong commitment to sustainability and environmental stewardship. It seeks to bridge the gap between digital innovation and ecological responsibility by empowering individuals to design, deploy, and manage telecommunications infrastructure and services that are energy-efficient, low-carbon, in alignment with global sustainability standards.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN2.1</b><br/><b>Green Skills Certification</b></p> <p>Introduce a nationally recognised certification for telecommunications professionals on specialised competencies such as energy-efficient network design, carbon accounting, and sustainable procurement and lifecycle management.</p>                                                                                                                        | <ul style="list-style-type: none"><li>Develops a sustainability-conscious workforce by embedding environmental considerations into core technical operations.</li></ul>                                                                                                                                                                                                                                                                                                                            |
| <p><b>IN2.2</b><br/><b>Green Telecommunications Hackathons and Innovation Labs</b></p> <p>Organise annual platforms for aspiring engineers, developers, and entrepreneurs to tackle real-world challenges such as reducing energy consumption in telecommunications networks, designing recyclable and modular telecommunications hardware, and developing AI-powered tools for sustainability tracking and reporting.</p> | <ul style="list-style-type: none"><li>Provides formal green credentials to telecommunications professionals, strengthening employability and career advancement opportunities.</li><li>Drives efficiency and sustainability through energy-efficient network design and responsible procurement, reducing costs, and resource consumption.</li><li>Supports compliance and ESG performance by helping companies meet environmental regulations and improve their sustainability ratings.</li></ul> |

101. Infocomm Media Development Authority (IMDA). (n.d.). *TechSkills Accelerator (TeSA)*. <<https://www.imda.gov.sg/how-we-can-help/techskills-accelerator-tesa>>

Case Studies

Singapore’s Digital Sustainability Initiatives<sup>103</sup>

In Singapore, the IMDA and the Government Technology Agency (GovTech) launched the country’s first digital sustainability initiatives to green the ICT sector and leverage digital tools to support broader environmental goals. The initiative provides funding for co-developing innovative, sustainable solutions with sector players while fostering partnerships across the ecosystem to establish best practices in digital sustainability. Its impact has been twofold: driving the sustainable growth of the ICT sector in line with national net-zero ambitions and enabling cost savings, carbon reduction, and greener innovation across both the public and private sectors. For Malaysia’s Telecommunications sector, this model highlights the importance of targeted government-industry collaboration to accelerate green innovation, reduce operational footprints, and ensure alignment with sustainability standards while strengthening competitiveness in the digital economy.

IN3 Synergise National Telecommunications and Digital Policy

The initiative seeks to align Malaysia’s key national policies and roadmaps such as MyDigital, JENDELA, and the National AI Framework into a unified strategy that embeds AI, Digital, and Green Economy principles at its core. By integrating these three (3) pillars, the initiative ensures future telecommunications and digital development not only accelerate innovation and competitiveness but also advances sustainability and environmental stewardship.

| Initiatives                                                                                                                                                                                                                                                                                                                         | Benefits                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN3.1</b><br/><b>Integrate AI / ML and Automation</b></p> <p>Position national AI frameworks (e.g: National Artificial Intelligence Roadmap (AI-RMAP) 2021–2025, MyDigital) as core enablers within telecommunications policy, embedding them as essential components of future network operations and spectrum planning.</p> | <ul style="list-style-type: none"><li>Reduces duplication and carbon footprint by encouraging tower sharing and passive infrastructure co-location among telecommunications platers.</li></ul>                                                                                                                                                                                |
| <p><b>IN3.2</b><br/><b>Embed Sustainability in Regulations</b></p> <p>Align telecommunications licensing and regulatory frameworks with national sustainability policy (e.g: NETR 2023–2050) to mandate energy-efficient infrastructure, carbon reporting, and circular economy practices in network equipment management.</p>      | <ul style="list-style-type: none"><li>Provides energy-efficient rural connectivity by prioritising Fixed Wireless Access (FWA) over extensive fibre trenching, especially in ecologically sensitive areas.</li><li>Cuts diesel reliance in rural sites by implementing solar-hybrid power systems and low-energy equipment to reduce reliance on diesel generators.</li></ul> |
| <p><b>IN3.3</b><br/><b>Unify Multi-Agency Strategies</b></p> <p>Strengthen coordination between agencies such as MOSTI, MCMC, HRD Corp, MOHE) through a single national roadmap that connects AI talent development, sustainable infrastructure targets, and digital upskilling at national scale.</p>                              | <ul style="list-style-type: none"><li>Enables future-ready industries by advancing 5G Standalone networks that support AI-powered applications like smart cities, telehealth, predictive maintenance, and autonomous transport.</li></ul>                                                                                                                                     |

102. Infocomm Media Development Authority (IMDA). (2024). *New Initiatives to Drive Digital Sustainability*. <<https://www.imda.gov.sg/resources/press-releases-factsheets-and-speeches/press-releases/2024/new-initiatives-to-drive-digital-sustainability>>



Case Studies

India’s National Telecom Policy (NTP-25)<sup>104,105</sup>

India is set to introduce its latest National Telecom Policy (NTP-25), aligning with the country’s vision of a digitally empowered future where telecommunications act as a key driver of economic development, social inclusion, and technological innovation. The policy sets ambitious targets, including extending 5G coverage to 90% of the population, connecting 100 million households with fixed broadband, and securing a 10% global share in 6G-related intellectual property rights. It also aims to position India among the world’s top ten (10) innovation hubs for advanced technologies. By advancing these goals, NTP-25 is expected to significantly strengthen India’s digital infrastructure while fostering inclusive economic growth. At the same time, it will elevate India’s position as a global leader in next-generation telecommunications, driving innovation and competitiveness in the digital economy.

Industry Players

IN4 Upskill Internal Talents in Emerging Technologies

This initiative calls on industry players to strategically invest in developing their internal workforce to meet future technological demands. By equipping employees with skills in edge computing, 5G, AI/ML, IoT, and cloud-native platforms, organisations can strengthen internal capabilities, reduce dependency on external expertise, and ensure long-term competitiveness in a rapidly evolving digital landscape.

| Initiatives                                                                                                                                                                                                                        | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN4.1</b><br/><b>Specialist Training Programmes</b><br/>Developed comprehensive training programmes on emerging technologies through online courses, workshops, and certifications.</p>                                      | <ul style="list-style-type: none"><li>Keeps the workforce future-ready and competitive by equipping employees with the latest skills and knowledge in emerging technologies.</li><li>Enhances employee engagement by fostering a supportive environment that boosts employee satisfaction and retention.</li><li>Drives innovation and differentiation by encouraging collaboration, creative problem-solving, and development of new ideas or products.</li><li>Strengthens organisational cohesion through active knowledge sharing and collective growth.</li></ul> |
| <p><b>IN4.2</b><br/><b>Mentorship and Knowledge Transfer</b><br/>Establish mentorship programmes to pair experienced employees with juniors to guide and support them through practical applications of new technologies.</p>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>IN4.3</b><br/><b>Innovation and Experimentation Platforms</b><br/>Organise hackathons and set-up innovation labs to foster collaboration and creative problem-solving that utilise emerging technologies.</p>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>IN4.4</b><br/><b>Culture of Continuous Learning</b><br/>Foster a culture of continuous learning by providing access to various learning platforms, resources, and time for employees to pursue their learning interests.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

103. VarIndia. (2024). Draft telecom policy sets up ambitious goals to be met by 2030. <<https://www.varindia.com/news/draft-telecom-policy-sets-up-ambitious-goals-to-be-met-by-2030>>

104. Telecom Review Asia. (2024). India’s draft telecom policy targets 90% 5G coverage by 2030. <<https://www.telecomreviewasia.com/news/policy-news/14062-indias-draft-telecom-policy-targets-90-5g-coverage-by-2030>>

Case Studies

Singtel 8George Academy<sup>106</sup>

To prepare its workforce for the rapid pace of digital transformation, Singtel launched a dedicated learning platform, Singtel 8George Academy, designed to upskill employees and strengthen their adaptability. The academy provides flexible, self-paced learning options delivered both in-person and virtually, ensuring accessibility for employees across different roles and schedules. The initiative is also backed by a renewed MoU with the Union of Telecoms Employees of Singapore (UTES), a reflection of the strong partnership between management and labour in workforce development.

Since its launch, the academy has trained more than 2,500 employees, equipping them with new skills to transition into emerging roles and enhancing career progression opportunities. Beyond individual growth, the initiative strengthens Singtel’s organisational resilience, ensuring the company maintains a workforce that can adapt swiftly to technological shifts while sustaining employee engagement and satisfaction.

IN5 Embed AI in Internal Network Operations and Integrate Sustainability into System Design

This initiative aims to embed AI and ML across network operations, from planning and deployment to monitoring, optimisation, and fault recovery, while integrating sustainability principles directly into system design and management. By combining AI-driven automation with sustainable practices, the Telecommunications sector can enhance operational efficiency, lower energy consumption, and accelerate the transition toward intelligent, low-carbon digital infrastructure.

| Initiatives                                                                                                                                                                                                                           | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN5.1</b><br/><b>AI-Powered Network Optimisation</b><br/>Leverage AI/ML algorithms across network layers to enable traffic forecasting, anomaly detection, and energy-efficient resource allocation.</p>                        | <ul style="list-style-type: none"><li>Boosts operational efficiency automating routine tasks, optimising resources, and reducing manual interventions.</li><li>Advances sustainability goals by integrating sustainability practices to reduce carbon footprint and operating costs in alignment with ESG targets.</li><li>Improves network reliability through early fault detection and diagnostics to reduce outages and extend equipment life.</li><li>Supports national transformation by contributing to the national net-zero targets and enabling AI-driven infrastructure.</li><li>Delivers measurable savings by reducing energy in bills, minimising downtime, and maximising asset utilisation.</li></ul> |
| <p><b>IN5.2</b><br/><b>Digital Twin for Sustainability Planning</b><br/>Adopt digital twin and predictive analytics tools to simulate energy consumption, network performance, and sustainability trade-offs prior to deployment.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>IN5.3</b><br/><b>Green Network Architectures</b><br/>Adopt green architectures such as Open RAN, cloud-native functions, and passive infra sharing, to minimise carbon footprint and power consumption.</p>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p><b>IN5.4</b><br/><b>Sustainability-Driven KPIs</b><br/>Integrate ESG metrics into network KPIs to measure sustainability performance alongside speed, latency, and reliability.</p>                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

105. The Straits Times. (2022). Singtel to invest \$20m yearly and start an academy to train its employees. <<https://www.straitstimes.com/singapore/singtel-to-invest-20m-yearly-and-start-an-academy-to-train-its-employees>>

Case Studies

**Growing Influence of AI/ML in Telecommunications<sup>107</sup>**

Telecommunications players are increasingly investing in advanced technologies such as AI, 5G, and 6G to drive growth and innovation. AI is being adopted to enhance network efficiency, customer service, and operations, while momentum is building toward networks that can self-manage and self-repair through automation. Companies like KDDI are also leading smart city initiatives by integrating telecommunications infrastructure with IoT. These advancements not only enable more streamlined, cost-effective, and autonomous network operations but also improve service reliability, personalisation, and response times. By shifting towards technology-driven service innovation, telecommunications providers are reducing dependence on legacy voice and messaging revenues while securing their role in the future digital economy.

IN6

Invest in R&D Partnerships with Universities Focused on AI, Digital, and Green Economy

This initiative highlights the importance of strategic collaboration between the Telecommunications sector and universities or research institutions to advance innovation in AI, digital technologies, and green infrastructure. By fostering joint research projects, living labs, and technology pilots, industry players can accelerate breakthroughs in automation, low-carbon networking, and next-generation connectivity. Such partnerships not only strengthens Malaysia’s research ecosystem but also build a robust talent pipeline by equipping emerging professionals with hands-on experience in future-focused technologies.

| Initiatives                                                                                                                                                                                                                                       | Benefits                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN6.1</b><br><b>Joint Research Centres</b><br>Establish joint research centres of endowed labs between telecommunications companies and top universities dedicated to AI/ML applications in telecommunications and sustainable network design. | <ul style="list-style-type: none"><li>Accelerates innovation by fast-tracking development of homegrown AI and green telecommunications solutions.</li></ul>                                                                                                                                                       |
| <b>IN6.2</b><br><b>Proof-of-Concept Projects</b><br>Co-develop proof-of-concept projects such as energy-aware 5G deployments, predictive network analytics, and other innovative projects in real-world conditions with academic partners.        | <ul style="list-style-type: none"><li>Strengthens research capacity by building advance expertise and retaining high-skill talent in local institutions.</li></ul>                                                                                                                                                |
| <b>IN6.3</b><br><b>Research Funds</b><br>Fund PhD and postdoctoral positions focused on telecommunications-AI integration, digital twin networks, Open RAN, and carbon-conscious infrastructure planning.                                         | <ul style="list-style-type: none"><li>Drives commercial impact by converting academic research into market-ready telecommunications products and tools.</li></ul>                                                                                                                                                 |
| <b>IN6.4</b><br><b>Shared IP and Commercialisation</b><br>Build joint intellectual property and patent portfolios from R&D outcomes to support global licensing potential and commercial opportunities.                                           | <ul style="list-style-type: none"><li>Advances sustainability targets by producing scalable, low-carbon solutions aligned with national green growth goals.</li><li>Enhances global positioning by establishing Malaysia as an innovation hub for telecommunications-AI and sustainable infrastructure.</li></ul> |

106. CNBC. (2025). Telcos race to transition from 'dumb pipes' to AI-enabled tech players. <<https://www.cnbc.com/2025/03/17/telcos-race-to-transition-from-dumb-pipes-to-ai-enabled-tech-players.html>>

Initiatives (Continued)

**IN6.5**  
**Innovation Challenges**  
Organise industry-academia grand challenges and competitions to crowdsource groundbreaking ideas on green networking and autonomous networks powered by AI.

Case Studies

**Deutsche Telekom - T-Lab and University Partnerships<sup>108</sup>**

T-Lab, the R&D arm of Deutsche Telekom, actively engages in long-term partnerships with universities through public-private models, endowed chairs, joint research projects, and dedicated innovation labs. These collaborations focus on emerging themes such as quantum networks, AI, network security, digital twins, and 6G, with initiatives like the 5G Co-Creation Lab showcasing the strength of industry-academia cooperation. By combining Deutsche Telekom’s industrial expertise with academic research excellence, these partnerships accelerate innovation in future network technologies, enable practical applications of AI and quantum computing in telecommunications, and support talent development through joint training and research opportunities.

Academia

IN7

Embed AI, Digital, and Green Economy Elements into Telecommunications Curriculum

This initiative calls for universities, polytechnics, and technical training institutions to integrate AI, digital transformation, and Green Economy elements into their telecommunications curriculum. By ensuring that all graduates gain foundational literacy in these areas, academic content will be better aligned with the sector’s shift toward software-defined networks, intelligent automation, and sustainable infrastructure, thereby equipping future talent with future-proof and sector-relevant skills.

| Initiatives                                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN7.1</b><br><b>Curriculum Review</b><br>Update telecommunications curriculum to include fundamental elements of AI in network automation, digital infrastructure planning, and green telecommunications system design. | <ul style="list-style-type: none"><li>Develops future-ready professionals who are equipped with fluency in AI, sustainability, and digital economy.</li></ul>                                                                                                                                                       |
| <b>IN7.2</b><br><b>Micro-Credential Pathways</b><br>Introduce micro credential programmes in areas such as AI, cloud, ESG, and sustainable networks that students can pursue alongside their degrees.                      | <ul style="list-style-type: none"><li>Aligns education with sector demands by keeping academic programmes aligned with global trends and local workforce needs.</li></ul>                                                                                                                                           |
| <b>IN7.3</b><br><b>Industry Advisory Engagement</b><br>Engage telecommunications industry partners to advise on AI, Digital, and Green Economy competencies to ensure alignment with in-demand jobs.                       | <ul style="list-style-type: none"><li>Improves curriculum quality by embedding AI, Digital, and Green Economy elements across certifications, diplomas, degrees, TVET, and micro-credentials.</li><li>Supports Malaysia’s aspiration to lead in regional green and digital telecommunications innovation.</li></ul> |

107. Deutsche Telekom. (n.d.). T-Labs. <<https://laboratories.telekom.com>>



| Initiatives (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Benefits (Continued) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>IN7.4</b><br><b>Accreditation Integration</b><br>Align updated programme learning outcomes with national accreditation frameworks (e.g: MQF, MQA, NOSS) to ensure recognition by employers and certification bodies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |
| <b>Case Studies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |
| <b>Xi-an Jiaotong – Liverpool University’s Master’s Programme<sup>109</sup></b><br>Xi’an Jiaotong – Liverpool University offers a master’s programme in Multimedia Telecommunications designed to develop future-ready leaders in an increasingly complex digital and telecommunications landscape. The programme builds systematic expertise in 4G, 5G, and 6G network architectures, multimedia coding and transmission, while also embedding AI technologies such as deep learning, computer vision, and image/video processing. By combining advanced communication engineering with applied AI, the programme equips graduates with dual strengths that enhance their competitiveness in the job market, while preparing them to address real-world industry challenges with innovative and technically robust solutions. |                      |

IN8

Address Time-to-Talent Bottlenecks via Project-Based and Fast-Track Pathways

This initiative seeks to shorten the time-to-talent gap in Malaysia’s digital and telecommunications workforce by embedding project-based learning and fast-track pathways within technical and higher education programmes. Such pathways ensure graduates are equipped with sector-relevant competencies faster than the traditional 3-4 years degree models, strengthening Malaysia’s capacity to respond quickly to the growing demand for AI-literate, green-aware, and cloud-ready talents.

| Initiatives                                                                                                                                                                                                                                  | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN8.1</b><br><b>Accelerated Pathways</b><br>Launch 6-18 month fast-track diploma and micro degree programmes in AI networks, sustainable telecommunications, and cloud infrastructure.                                                    | <ul style="list-style-type: none"><li>• Accelerates talent readiness by producing workforce-ready graduates who can meet fast-evolving industry needs.</li></ul>                                                                                                                                                                                                                                                                                            |
| <b>IN8.2</b><br><b>Project-Based Learning</b><br>Embed project-based learning modules across programmes using real-world problems sponsored by telecommunications companies, regulators, and green tech firms (e.g: teaching factory model). | <ul style="list-style-type: none"><li>• Expands upskilling opportunities by enabling both youth and working professionals to upskill or reskill through modular options.</li></ul>                                                                                                                                                                                                                                                                          |
| <b>IN8.3</b><br><b>Earn and Learn Pathways</b><br>Blend classroom training with paid industry placements, enabling students to apply new skills in live work settings.                                                                       | <ul style="list-style-type: none"><li>• Strengthens practical capabilities by ensuring students gain practical, hands-on experience through live projects and internships.</li><li>• Improves accessibility by offering shorter, flexible programmes tailored for rural, underserved, and mid-career learners.</li><li>• Bridges digital skills gaps by reducing hiring lags and supplying talents in AI, sustainability, and telecommunications.</li></ul> |

108. Xi’an Jiaotong-Liverpool University (XJTLU). MSc Multimedia Telecommunications. <<https://www.xjtlu.edu.cn/en/study/masters/multimedia-telecommunications>>

| Initiatives (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Benefits (Continued) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>IN8.4</b><br><b>Stackable Credentials</b><br>Offer stackable credentials tied to emerging job roles such as Cloud Ops Engineer, Digital Twin Analyst, Sustainable Network Technician.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |
| <b>IN8.5</b><br><b>Cross-Sector Bootcamps</b><br>Partner with HRD Corp and MDEC to develop cross-sector bootcamps to rapidly deploy reskilled talent into digital green jobs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |
| <b>Case Studies</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |
| <b>Stanford Digital Education’s High School AI Literacy Initiative<sup>110</sup></b><br>Stanford Digital Education (SDE) has launched a high school–focused initiative designed to equip students with foundational literacy in AI and its broader societal implications. Developed in collaboration with high school teachers, the programme integrates custom AI lessons with Google’s AI Essentials online course, featuring practical exercises in prompt writing, AI image generation, and demonstrations of how AI systems are trained. Students who complete the programme are eligible to earn a Google Career Certificate, strengthening both their academic and career readiness. By combining hands-on activities with structured learning, the initiative helps students build critical thinking skills about AI, understand its impact on their future job prospects, and prepare to use AI tools in their careers. It also encourages AI literacy across different subjects, ensuring the content is relevant and accessible to a broad range of learners. |                      |

IN9

Co-Develop Capstone Projects and Living Labs with Industry Partners

This initiative promotes structured collaboration between academia and industry to co-develop capstone projects and living labs anchored in real use cases. By focusing on challenges such as digital infrastructure, AI-enabled networks, and sustainable telecommunications systems, students can demonstrate their competence in applying knowledge on current sector issues. These hands-on platforms not only bridge theory and practice but also give companies early access to emerging talents and applied research outcomes.

| Initiatives                                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN9.1</b><br><b>Sector-Aligned Capstone Projects</b><br>Design final-year capstone projects in partnership with vendors such as TM, CelcomDigi, or EDOTCO, focusing on AI, Open RAN, and green networks.                | <ul style="list-style-type: none"><li>• Translates theoretical knowledge into applications by enabling practical problem-solving with real-world impact.</li></ul>                                                                                                                     |
| <b>IN9.2</b><br><b>Living Labs Experimentation</b><br>Establish campus-based living labs that enable hands-on experimentation in areas like 5G signal optimisation, energy usage monitoring, or smart campus connectivity. | <ul style="list-style-type: none"><li>• Fosters workforce readiness by giving vendors early visibility on high-potential graduates.</li><li>• Promotes national innovation by developing applied research, local IP creation, and solutions tailored to national priorities.</li></ul> |

109. Stanford University. (2025). Stanford Digital Education creates AI curriculum for high schools. Stanford News. <<https://news.stanford.edu/stories/2025/02/stanford-digital-education-creates-ai-curriculum-for-high-schools>>

| Initiatives (Continued)                                                                                                                                                                        | Benefits (Continued)                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN9.3</b><br><b>Industry Mentorship</b><br>Engage vendor engineers as co-mentors to guide students through sector-aligned project execution.                                                | <ul style="list-style-type: none"><li>Bridges sector-academia gaps by aligning curriculum with evolving telecommunications needs.</li><li>De-risks implementation by enabling iterative testing of technologies before nationwide deployment.</li></ul> |
| <b>IN9.4</b><br><b>Innovation Showcases</b><br>Create an innovation showcase platform where top projects are pitched to hiring managers and tech incubators for potential funding or scale-up. |                                                                                                                                                                                                                                                         |
| <b>IN9.5</b><br><b>IP and Commercialisation</b><br>Encourage publication and IP generation from standout projects, enabling early-stage commercialisation or startup incubation.               |                                                                                                                                                                                                                                                         |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Singapore Institute of Technology’s Living Lab Network<sup>111</sup></b><br>The Singapore Institute of Technology (SIT) has launched a Living Lab Network (LLN) at its Punggol campus, creating a real-world test environment that provides students and industry partners with direct access to live campus systems and data. The LLN’s multi-tiered access model supports hands-on student learning while offering external partners a plug-and-play “testbed-as-a-service” to trial and refine new technologies in an operational setting. This initiative not only accelerates practical innovation and solution development but also establishes SIT as a critical hub for cultivating industry-aligned talent and sustaining long-term collaborative partnerships between academia and the technology sector. |

Training Providers

IN10

Develop Training Programmes for AI, Digital, and Green Economy by Onboarding Local Skilled Talents

This initiative aims to enhance the role of training institutions in future-proofing Malaysia’s telecommunications workforce by recruiting and leveraging reputable trainers with deep expertise in AI, digitalisation, and green technologies and familiarity with local telecommunications trends and regulations. By ensuring trainers possess up-to-date knowledge of local sector trends, regulatory requirements, and emerging global standards, the programme aligns workforce development directly with national goals and evolving sectoral demands. This approach not only elevates the quality and relevance of training but also ensures that skills development is context-aware, sector-responsive, and strategically positioned to support both individual career growth and broader economic objectives.

| Initiatives                                                                                                                                                                              | Benefits                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN10.1</b><br><b>Localised Curriculum Development</b><br>Training institutions need to assess and tailor training modules to align with local sector needs and regulatory frameworks. | <ul style="list-style-type: none"><li>Ensures training relevance by aligning programme delivery with the latest telecommunications trends and regulatory requirements.</li></ul> |

110. Singapore Institute of Technology (SIT). (2024). SIT unveils Living Lab Network to enhance applied learning and industry innovation. <<https://www.singaporetech.edu.sg/news/sit-unveils-living-lab-network-enhance-applied-learning-and-industry-innovation>>

| Initiatives (Continued)                                                                                                                                                                                     | Benefits (Continued)                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN10.2</b><br><b>Emerging Technology Integration</b><br>Embed AI, Digital, and Green Economy practices into sector-specific training applications.                                                       | <ul style="list-style-type: none"><li>Improves practical applicability by contextualising training content to address real-world national challenges.</li><li>Builds local training capacity by developing a skilled and sustainable pool of local educators and specialists.</li></ul> |
| <b>IN10.3</b><br><b>Collaborative Content Development</b><br>Partner with sector players, academia, and government to co-develop training content and share resources.                                      |                                                                                                                                                                                                                                                                                         |
| <b>IN10.4</b><br><b>Local Trainer Development</b><br>Address the shortage of skilled local trainers through Train-the-Trainer (TTT) programmes to identify potential local trainer or sector professionals. |                                                                                                                                                                                                                                                                                         |
| <b>IN10.5</b><br><b>Knowledge Transfer Programme</b><br>Pair international experts with local trainers for knowledge transfer phase via the ‘shadow teaching’ method to build local expertise.              |                                                                                                                                                                                                                                                                                         |
| <b>IN10.6</b><br><b>Financial Incentives</b><br>Offer financial incentives and professional recognition to sector experts transitioning into teaching roles.                                                |                                                                                                                                                                                                                                                                                         |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Singapore's Train the Trainer (TTT) Programme<sup>112</sup></b><br>Singapore's Train the Trainer (TTT) Programme equips workplace managers, supervisors, and training leads with the expertise to design, deliver, and evaluate effective in-house employee development initiatives. The programme features tailored modules such as Prepare and Conduct Coaching, which builds skills for hands-on on-the-job training delivery, and Design and Develop Training Curriculum, which focuses on identifying organisational training needs and creating structured internal programmes. By strengthening instructional capabilities within organisations, the TTT initiative ensures that workforce development is aligned with practical business requirements, enhances employee competency, and supports sustained organisational growth through scalable, internally driven learning solutions. |

111. Institute of Technical Education (ITE). Train the Trainer. <<https://www.ite.edu.sg/adult-learners/train-the-trainer>>



Taking into account the initiatives proposed, moving forward, these are the

**Top 5 Initiatives** needed to kickstart the workforce transformation towards AI, Digital, and Green Economy to ensure their successful implementation

1 |  GOVERNMENT

**Establish value creation programmes to bridge the gap** between traditional telecommunications training and the evolving demands of the digital infrastructure landscape. This will cultivate a new generation of talents equipped with advanced technical skills, innovative thinking, and entrepreneurial capabilities, ensuring Malaysia remains competitive in the global tech system.

2 |  GOVERNMENT

**Synergise Malaysia's core telecommunications and digital policies** such as MyDigital, JENDELA, and the National AI Framework into a formal unified strategy to formally align strategic priorities in AI, Machine Learning, and sustainability. This will ensure cohesive planning, accelerate cross-initiative implementation, and strengthen Malaysia's position as a digitally advanced and sustainable economy.

3 |  ACADEMIA

**Advocate embedding AI, digital transformation, and Green Economy elements into the telecommunications curriculum** at educational and training institutions. There is an urgent need to realign academic curriculum as the sector shifts towards software-defined networks, intelligent automation, and sustainable infrastructure. Doing this will equip graduates with sector-relevant skills and future-proof skills.

4 |  ACADEMIA

**Introduce seamless integrated academia-industry talent development programmes** at national level to shorten the time-to-talent gap in Malaysia's digital and telecommunications workforce by embedding project-based learning and fast-track pathways into technical and higher education programmes.

5 |  TRAINING PROVIDERS

**Develop strategic trainer development and curriculum alignment** by recruiting and leveraging reputable trainers with expertise in AI, digitalisation, and green practices; tailoring training modules to align with local telecommunications needs and regulations; collaborating with industry and government to develop curricula; and addressing trainer shortages through structured Train-the-Trainer programmes, international knowledge transfer initiatives, and incentives schemes to attract and retain local trainers.

# Conclusion

This impact study has provided a comprehensive analysis of the profound and concurrent disruptions of AI, Digital, and Green Economy trends on Malaysia's Telecommunications sector. The findings underscore a sector at a pivotal juncture, characterised by rapid technological advancement, evolving national agendas, and an urgent need for a future-ready workforce.

A key output of this impact study is the detailed impact assessment on the workforce. The analysis of 147 roles reveals seven (7) roles are highly impacted by automation, necessitating upskilling and pivot towards higher value responsibilities involving complex decision-making, oversight of automated systems, or ethical governance. 76 roles are medium impacted roles, where these roles are evolving rather than being displaced as AI and digitalisation increasingly augment tasks. The core purpose of these roles remains essential, but the skill sets required are shifting towards managing and working alongside intelligent systems. 64 roles are low-impacted, less susceptible to immediate technological impacts as they rely on physical presence, manual dexterity, and complex human interaction and intervention. However, continuous learning remains vital in order to remain agile in a fast-evolving sector. Additionally, the study identifies three (3) emerging roles that signifies the sector's transition from pure connectivity provision to becoming architects of intelligent, ethical, and distributed digital ecosystems. These roles are AI Engineers, AI Ethics Officers, and Edge Computing Specialists.

The convergence of AI, Digital, and Green Economy forces is fundamentally reshaping the sector's value chain, creating both significant opportunities and pressing challenges. Malaysia has demonstrated strong progress in digital infrastructure, with one of the region's most advanced 5G rollouts and strategic initiatives like JENDELA laying a robust foundation for a digital economy. However, the sector must navigate persistent hurdles, including high energy consumption, significant skills shortages in emerging fields, and the financial pressures of network decarbonisation. The recommended ten (10) initiatives, structured across Government, Industry Players, Academia, and Training Providers, are designed to address these challenges holistically.

This collaborative endeavour, championed through the GIAT model and supported by platforms like MyMahir, will be fundamental in securing the sector's long-term resilience, achieving national development goals, and reinforcing its global competitive edge in the evolving built environment.

In conclusion, the successful navigation of this triple disruption is not merely an operational imperative but a strategic national priority. By embracing the recommended initiatives through concerted multi-stakeholder collaboration, Malaysia's Telecommunications sector can transform these challenges into opportunities. This will ensure the sector not only enhances its competitiveness and innovation capacity but also secures its role as a key enabler of a digitally advanced, inclusive, and sustainable Malaysian economy. The journey ahead requires sustained investment, strategic alignment, and a shared commitment to empowering the Malaysian workforce for the digital age.

Key trends impacting existing roles:

-  Artificial Intelligence
-  Digital
-  Green Economy





# Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Phase 2, Volume 2

Sector:  
**Communications &  
Multimedia:  
Broadcasting**



## Chapter 4.1: Sector Overview

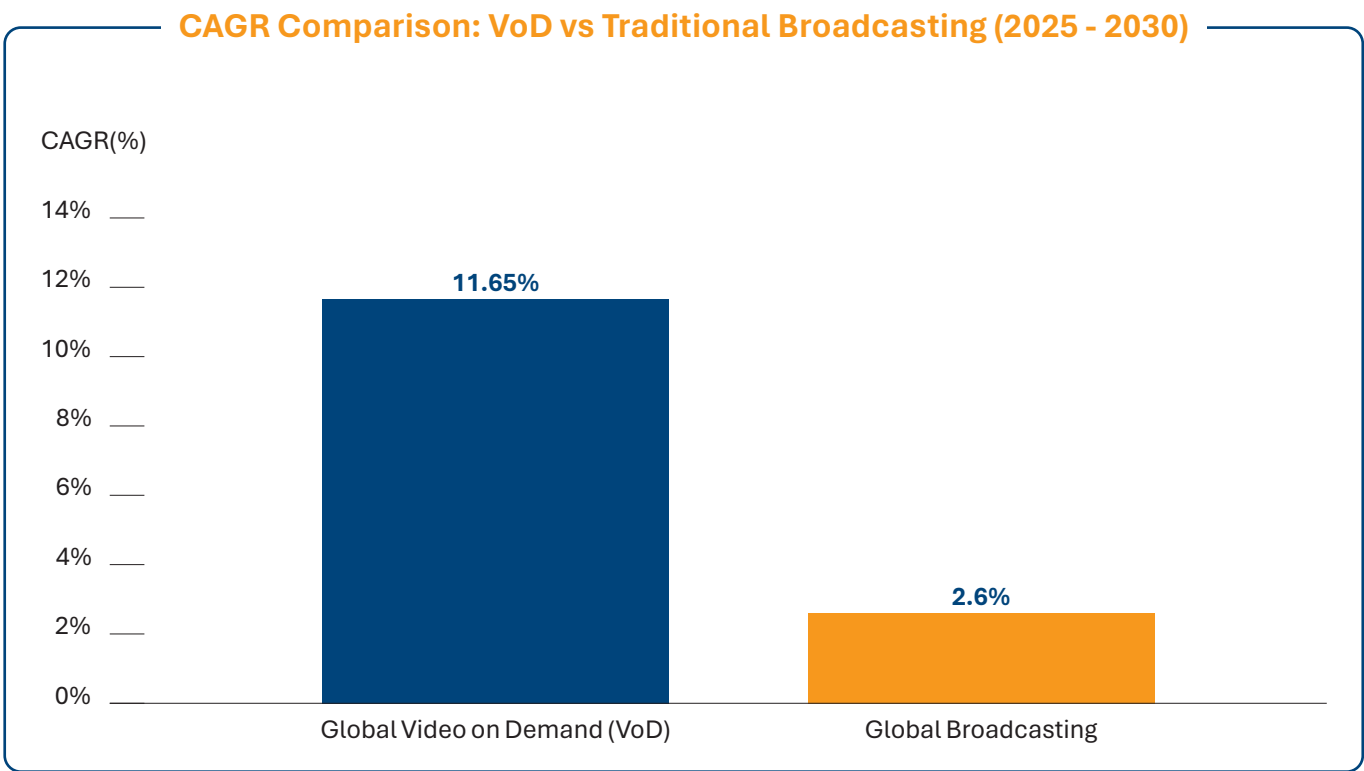
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# Overview of Global Trends in the Broadcasting Sector

Globally, the Broadcasting sector is increasingly diversifying to stay relevant as Over-The-Top (OTT) players dominate the market. Broadcasting remains a vital industry worldwide, delivering information and entertainment through cable, terrestrial, satellite TV, and radio frequencies. To retain audiences, traditional broadcasters continue to offer diverse content across these platforms.

However, the sector is experiencing slow growth, with a projected CAGR of just 2.6% between 2025 and 2033,<sup>112</sup> and even lower at 1.2% in parts of Latin America and Europe for Pay TV bundled with telecommunications services and Video-on-Demand (VoD). This slow pace reflects the growing dominance of OTT platforms such as Netflix, Disney+, and Comcast, which deliver content via open internet infrastructure without depending on telecom-owned networks. In 2024, OTT accounted for 72% of global VoD revenue and is expected to grow at a robust CAGR of 11.65% from 2025 to 2030.<sup>113</sup>



Source: Business Research Insight

As OTT becomes the new industry standard, traditional broadcasters must undergo significant digital transformation to remain competitive, or risk becoming obsolete in an increasingly digital-first media landscape. Therefore, broadcasting today is diversifying with full awareness that OTT players are rapidly advancing their services.

### Video-on-Demand Industry Leaders

| No | Company                         | Platform/Brand      |
|----|---------------------------------|---------------------|
| 1  | <b>NETFLIX</b><br>Netflix Inc.  | <b>N</b><br>Netflix |
| 2  | <br>The Walt Disney Company     | <br>Disney+ & Hulu  |
| 3  | <br>Warner Bros. Discovery Inc. | <br>Max             |
| 4  | <br>Apple Inc.                  | <br>Apple TV+       |
| 5  | <br>Amazon.com Inc.             | <br>Prime Video     |

*Note: Major players are listed with no particular ranking order.*

#### Market Concentration (Video-on-Demand Market)

**Consolidated** Market dominated by 1–5 major players

**Fragmented** Highly competitive market without dominant players

Video-on-Demand

Source: Mordor Intelligence<sup>114</sup>

In response to this global shift, broadcasters are adopting on-demand platforms and cloud broadcasting. For example, Fox Sports has partnered with Amazon Web Services (AWS) to use its cloud-native video processing tools. This has enabled live video streams, highlights, and replays to be processed and distributed instantly from the cloud.<sup>115</sup> NHK in Japan, on the other hand, is currently offering NHK Plus, which primarily provides on-demand and live content in 4K high resolution. In 2018, NHK also launched the first daily 8K TV channel, NHK BS8K, featuring content in ultra-high-definition 8K format.<sup>116</sup> Furthermore, content localisation and personalisation are increasingly being embraced by broadcasters as part of their diversification strategies. For example, Rai in Italy is leveraging GenAI to create metadata and provide tailored content recommendations.<sup>117</sup>

Closer to home, Mediacorp in Singapore offers multilingual programming through meWATCH (English, Mandarin, Malay, and Tamil) and showcases locally produced series across languages. These developments illustrate how local broadcasters are working to retain audiences and grow subscriptions to their proprietary digital platforms while maintaining relevance.

112. Business Research Insights, Broadcast Media Market Size, Share, Growth, Trends and Industry Analysis, By Type (Cable Radio, Wireless Radio), By Application (Government Unit, Commercial, Other), Regional Insights and Forecast From 2025 to 2033, 11 August 2025, <<https://www.businessresearchinsights.com/market-reports/broadcast-media-market-108330>>

113. Mordor Intelligence, Video on Demand Market Size & Share Analysis - Growth Trends & Forecasts (2025 - 2030), 30 July 2025, <<https://www.mordorintelligence.com/industry-reports/video-on-demand-market>>

114. Mordor Intelligence, Video on Demand Market Size & Share Analysis - Growth Trends & Forecasts (2025 - 2030), 30 July 2025, <<https://www.mordorintelligence.com/industry-reports/video-on-demand-market>>

115. AWS, FOX Delivers Uncompressed Live Sports in the Cloud with AWS, 2020, <<https://aws.amazon.com/solutions/case-studies/fox-reinvent-media-services-case-study/>>

116. NHK STRL, 8K Super Hi-Vision Standardization Initiatives, 2016, <<https://www.nhk.or.jp/strl/english/publica/bt/64/1.html#>>

117. Philip Hunter, Generative AI & Content Recommendation, The Broadcast Bridge, 9 May 2025, <<https://www.thebroadcastbridge.com/content/entry/21175/generative-ai-content-recommendation>>



# Overview of Malaysian Trends in the Broadcasting Sector



Malaysia’s Broadcasting sector is at a pivotal moment. Contributing RM5.98 billion to the economy, or 0.33% of total GDP, the industry supports 16,169 employees across four (4) sub-sectors: production, technical, sales and advertising, and support, through 14 licensed operators.<sup>118</sup> Built on a dual ecosystem of public and private broadcasters under the oversight of the MCMC, the landscape spans free-to-air (FTA) television, radio, and subscription-based pay-TV, with increasing convergence into digital and OTT platforms. While traditional broadcasters such as RTM (public) and Media Prima and ASTRO (private) continue to dominate the legacy market, the industry is being reshaped by digital disruption, changing consumer habits toward on-demand content, and advertising spend shifting to digital media.

## Alignment to National Agenda



The sector is guided by government priorities, including media digitalisation, local content development, and socio-cultural nation-building, as it works to balance commercial goals with public interest responsibilities.

The MCMC Technology Roadmap, developed in line with the Malaysian Technical Standards Forum Bhd (MTSFB) Strategic Plan 2025–2030, sets the direction for Malaysia’s transition toward advanced digital infrastructure. Key focus areas include expanding nationwide broadband through JENDELA, completing the migration to digital television with myFreeview, and advancing 5G-enabled broadcasting technologies. The roadmap also prioritises the development of standards for hybrid broadcast broadband (HbbTV), the integration of AI in content workflows, and sustainability initiatives. Complementary policies such as CMIR 2030, MCMC Nexus, and infrastructure management systems drive regulatory modernisation and strengthen Malaysia’s position as a regional hub for digital broadcasting and communications.<sup>119</sup>

118. MCMC, Strategic Communications and Multimedia Technology Roadmap 2025-2030 (MyTMAP2030), 2025

## A Snapshot of the Broadcasting Sector in Malaysia

**GDP Contribution**  
**RM5.98 billion** 2023e (2023e referring to the year)

### Sub Sectors

**Production:**  
Includes the development, planning, and production of content across editorial, creative, on-air, post-production, and programming activities to ensure smooth delivery of broadcasts on television, radio, and digital platforms.

**Technical:**  
Involves the operation, maintenance, and management of equipment for filming, sound, lighting, transmission, and post-production, ensuring that the technical aspects of broadcasting, including visuals, audio, and transmission quality, are consistently maintained across television, radio, and digital platforms.

**Sales and Advertising:**  
Involves the commercial function that generates revenue through the sale of airtime, sponsorships, branded content, digital advertising, and partnerships across television, radio, and online platforms.

**Support:**  
Involves administrative, logistical, scheduling, compliance, and managerial tasks that support the smooth operation of broadcasting, assisting both production and technical teams with responsibilities such as programme scheduling, rights management, and legal and regulatory compliance.

| Number of Employees | Number of Licensees |
|---------------------|---------------------|
| <b>16,169</b> 2022  | <b>14</b> 2022      |

In line with global patterns, Malaysian broadcasters are facing mounting pressure as digital platforms transform the media landscape. Conventional outlets like free-to-air television are steadily declining, particularly in their ability to attract advertising revenue.<sup>119</sup> The impact of this shift is evident in the data. As of 2022, global players such as YouTube and Meta each recorded more than 20 million monthly active users in Malaysia, however local platforms like Astro GO and Tonton attracted fewer than 5 million. Pay TV has also been on the decline, with household penetration falling from 80.7% in 2022 to 65.4% in 2024.<sup>120</sup> In contrast, OTT video platforms are experiencing rapid revenue growth, with a CAGR of 11.7% and are set to reach RM1.6 billion, compared to a -5.0% decline in traditional TV.

Similarly, digital advertising is leading the pack and is forecast to grow at a CAGR of 10.8% from 2023 to 2028. This growth is driven by platforms such as TikTok, YouTube, and super-apps like Grab, which now attract more advertising spend by offering hyper-targeted and interactive campaigns that compete directly with traditional broadcasters.<sup>121</sup> In response, Malaysian broadcasters are rethinking their strategies with a stronger focus on local content that can be developed into enduring intellectual property. By creating stories and characters that resonate with local audiences, they are opening new revenue streams through licensing, streaming partnerships, brand collaborations, and integrated advertising campaigns. A notable example is Keluang Man, the iconic Malaysian superhero, which is currently in discussions for international licensing with major OTT platforms. If successful, this initiative could generate sustainable recurring revenue while positioning Malaysian content on the global stage.<sup>122</sup>

119. Business Today, Slippery Slope For Traditional Media, Kenanga Has No Picks, 20 April 2024, <<https://www.businesstoday.com.my/2024/04/20/slippery-slope-for-traditional-media-kenanga-has-no-picks/>>  
120. MCMC Internal Report, [https://www.mcmc.gov.my/skmmgovmy/media/General/pdf2/MCMC-IPR-2024\\_V-241025-2.pdf](https://www.mcmc.gov.my/skmmgovmy/media/General/pdf2/MCMC-IPR-2024_V-241025-2.pdf)  
121. PwC, PwC’s Global Entertainment & Media Outlook Perspectives 2024–2028: Seizing opportunities through business model reinvention, 2024, <<https://www.pwc.com/my/en/assets/publications/2024/pwc-my-entertainment-and-media-outlook.pdf>>  
122. Kylie Chan Sze Zan, Still Waiting for a Silver Lining, Kenanga, 8 April 2025, <<https://www.kenanga.com.my/wp-content/uploads/2025/04/MEDIA-250408-SU-2QCY25-Strategy-Kenanga.pdf>>

Opportunities

Malaysia’s Broadcasting sector is making significant strides in AI, data analytics, and content localisation, opening up new opportunities for innovation, collaboration, and growth. Local developments already show how broadcasters are adapting to stay relevant, often mirroring global trends. **TV AlHijrah**, for example, uses analytics to tailor more than 8,000 hours of Islamic content, providing customised recommendations and updates that enhance engagement, broaden global reach, and strengthen its role as a hub for Islamic education and entertainment.<sup>123</sup>

**Astro Group** leverages Microsoft Azure’s cloud infrastructure and big data analytics to power its Digital Customer Profiling technology. This allows the company to interpret consumer interests in real time and predict preferences with statistical accuracy, delivering highly relevant content across platforms such as Stadium Astro.<sup>124</sup> **RTMKlik** has also transformed its OTT service by migrating to Amazon Web Services’ cloud infrastructure. This move streamlines content creation and sharing while ensuring scalability for larger audiences. The platform has further improved user experience with customised subtitles across its linear channels, including TV1, Saluran Berita, and RTM ASEAN Channel. **Media Prima**, meanwhile, has adopted Insider’s personalisation platform since 2017 to optimise content delivery. Using behavioural and predictive analytics such as tracking article clicks, time spent, and preferred authors, it delivers tailored homepage content and automated push notifications, creating a more engaging user journey.<sup>125</sup>

Local broadcasters are also unlocking growth through content localisation, strengthening

Malaysia’s multicultural identity by producing shows in Bahasa Malaysia, Mandarin, Tamil, and various regional dialects. For example, **Astro** continues to showcase both local and international Tamil productions such as Oor Sutrum Boys and Kambathu Ponnu, while Mandarin titles like Spirit Hunter and Born to Shine cater to Chinese-speaking audiences.<sup>126</sup>

**RTM Sarawak** provides another strong example, serving 26 ethnic groups across eight (8) radio channels. Flagship programmes like Jako Pesan on WAIfm Iban keep communities connected with local updates, while digital initiatives such as streaming Juh Bermukun on Facebook, which drew more than 150,000 views, illustrate how traditional radio is finding new life and relevance on online platforms.<sup>127</sup>

At the same time, the revival of beloved characters and series such as Keluang Man and Upin & Ipin shows how broadcasters are tapping into nostalgia while keeping these stories alive for younger, digital-native audiences. These properties are further expanded through licensing opportunities, cross-industry partnerships, and merchandise, turning them into valuable long-term assets that generate recurring revenue beyond the limits of conventional TV broadcasting.<sup>128</sup> Meanwhile, platforms like Tonton, Sooka, and RTMKlik are making localised content more accessible to younger, tech-savvy audiences who prefer streaming over scheduled programming.<sup>129</sup> By doing so, Malaysian broadcasters are carving out a competitive edge against global OTT giants, offering viewers culturally authentic content in languages and formats that resonate deeply with them.

Additionally, broadcasters are increasingly integrating AI into their workflows. One example can be seen in **Media Prima**, which pioneered

the use of AI in Malaysian radio with the launch of DJ Aina, the nation’s first AI-driven radio host. DJ Aina curates playlists and hosts interactive segments, showing how AI can simulate human-like engagement and deliver personalised listening experiences. This innovation adds a modern edge to radio broadcasting and attracts younger, more tech-savvy audiences.<sup>130</sup> **Astro Awani** has also embraced AI with the introduction of its virtual news anchors, Joon and Monica, who deliver daily bulletins at 7:45 PM. The initiative later expanded with Elin tAI for Chinese-language news, broadcast across Astro AEC, Astro GO, and Sooka. These AI anchors enable Astro to scale content production more efficiently, broaden its language offerings, and better serve Malaysia’s diverse, multicultural audience.<sup>131</sup>

Furthermore, **RTM** is taking a step-by-step approach to AI adoption. It began by improving content search with AI-generated metadata, then moved to supporting reporters through AI transcription and translation, and is now enhancing distribution with AI avatars such as Aaron Lim and Che Rita. **Bernama TV** is also jumping on the AI bandwagon, adopting voice-to-text transcription and multilingual processing to streamline newsroom workflows and speed up content production across multiple languages. Partnering with Universiti Sultan Zainal Abidin (UniSZA), Bernama is further developing AI tools such as chatbots for audience interaction and analytics systems to boost content relevance and guide smarter newsroom decisions.<sup>132</sup>

Challenges

Although Malaysia’s Broadcasting sector is advancing in AI, data analytics, and content localisation, it continues to face **challenges from external competitors**, ethical concerns around AI, and talent gaps. One key challenge is competition from global mega platforms such as YouTube, Netflix, and TikTok, which offer extensive on-demand content libraries tailored through AI and user algorithms. This has shifted consumer preferences away from traditional TV toward mobile-first and personalised content, reducing viewership for local free-to-air channels and pay-TV platforms.<sup>133</sup>

Furthermore, Malaysian broadcasters are also **losing advertising revenue** as advertisers shift budgets to global platforms like Google and Meta, which offer advanced AI-driven targeting through programmatic advertising. These platforms attract over 20 million monthly users each, far surpassing local OTT services like Tonton and Astro GO, which remain under 5 million<sup>134</sup> Ultimately, the future of broadcasting in Malaysia will depend on how

effectively broadcasters can blend the convenience of online streaming with the trusted and familiar experience of traditional TV, creating an ecosystem that meets evolving viewer habits while preserving the sense of connection that broadcast media provides.

Another major concern is **AI ethics and content risks in broadcasting**. Current AI-driven tools for generating subtitles and enforcing content censorship are still unable to fully meet Malaysia’s cultural and regulatory expectations. Suggestive scenes that fall under local broadcasting guidelines sometimes slip through automated filters, requiring continued human oversight.<sup>135</sup> Also, the increasing accessibility of deepfake technologies and AI-generated voice cloning poses serious threats to the integrity of broadcasting. These technologies have the capability to spread false or misleading information, impersonate public figures, and damage reputations, creating challenges for broadcasters striving to maintain trust and authenticity in news and entertainment content.

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127. Sinar Harian, RTM 75 tahun: Hala tuju dan cabaran untuk terus kekal relevan, 30 March 2021, <<https://www.sinarharian.com.my/article/131003/berita/semasa/rtm-75-tahun-hala-tuju-dan-cabaran-untuk-terus-kekal-relevan>>

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129. Marketing Magazine, Tonton’s Best Kept Secret: Regional Offerings, 23 November 2016, <<https://marketingmagazine.com.my/tonton-s-best-kept-secret-regional-offerings/>>

130. Media Prima Audio, Aina Sabrina: The Malaysia’s First AI Radio DJ, 2023, <<https://www.mediaprima.audio/aina-sabrina-the-malaysias-first-ai-radio-dj/>>

131. Astro Awani, Selamat datang Joon dan Monica ke Astro AWANI, gelora AI mula terasa, 8 May 2023, <<https://www.astroawani.com/berita-malaysia/selamat-datang-joon-dan-monica-ke-astro-awani-gelora-ai-mula-terasa-418654>>

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135. Nur Hashima Edhan and Heu Wen Yen, Legal Landscape of Generative AI Governance in Malaysia, Azmi Law, 1 November 2023, <<https://www.azmilaw.com/insights/legal-landscape-of-generative-ai-governance-in-malaysia/>>



Furthermore, **AI-driven tools in broadcasting**, ranging from automated news writing to personalised content recommendation systems, raise concerns regarding transparency, accountability and algorithmic bias. The literature highlights that AI systems may reproduce biases embedded in datasets and algorithms, potentially affecting the accuracy, fairness and credibility of news reporting. Limited transparency in algorithmic decision-making can also undermine public trust, underscoring the need for stronger ethical governance and editorial oversight.<sup>136</sup> Adding to these concerns, broadcasters adopting AI tools face challenges related to transparency, accountability and algorithmic bias. The literature highlights that AI systems may reproduce or amplify biases embedded in datasets and algorithms, potentially affecting the accuracy, fairness and credibility of news reporting. Limited transparency in algorithmic decision-making and

reduced editorial visibility may also undermine public trust, underscoring the need for stronger ethical governance, accountability mechanisms and editorial oversight.<sup>137</sup>

Another challenge for the industry is the **talent and training gap** that hinders AI adoption in broadcasting. Limited broadcast-specific AI training infrastructure, such as smart studios and virtual production labs, restricts hands-on exposure for media professionals. The lack of workforce readiness and AI-specific skills among broadcast talent slows digital transformation, while the high costs of adopting AI technologies create additional barriers, especially for smaller broadcasters. Compounding the issue, many broadcasting-related AI training programmes are not HRDF-registered, limiting employers' ability to claim training subsidies offered by the government.<sup>138</sup>



136. Abdul Wahab, S., Mohamed, S., Tew Abdullah, M. H., & Nordin, A. S. S. (2026). Artificial Intelligence in Broadcast Journalism: A Systematic Literature Review of Newsroom Transformation and Media Ethics in Malaysia. International Journal of Research and Innovation in Social Science (IJRISS), 10(6), 1778-1789. DOI: 10.47772/IJRISS.2026.100600133

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# Impact and Adoption of AI, Digital, and Green Economy on the Broadcasting Sector

The Broadcasting sector is undergoing a paradigm shift, propelled by the convergence of three (3) interconnected revolutions: AI, Digital, and the Green Economy. These forces are not only redefining how content is created, distributed, and consumed, but also reshaping the roles of broadcasters and audiences alike. Together, they are transforming the broadcasting landscape into one that is more intelligent, interactive, and audience-focused.

## A Artificial Intelligence

AI is becoming ever more central to the Broadcasting sector, revolutionising the industry by delivering personalised content and driving deeper, more meaningful audience engagement.

### Global Trends

Around the world, AI is driving transformative change across industries, and the Broadcasting sector is no exception. AI is driving significant change across this sector in the following key areas:

- 1. Usage of Natural Language Processing (NLP)<sup>139</sup>**
  - The use of NLP is transforming the Broadcasting sector. It personalises content discovery, creating hyper-responsive and context-based interactions, as seen in the increasing adoption of AI anchors in news broadcasting around the world. At the same time, NLP can analyse video metadata, speech, text, and facial cues, freeing news teams from routine tasks so they can concentrate on storytelling.
- 2. Usage of Machine Learning**
  - The use of Machine Learning is reshaping the Broadcasting sector. It automates the tagging of video and audio content by analysing transcripts, visuals, and context, improving search and content discovery. Machine Learning also drives viewer engagement by delivering predictive and personalised suggestions across digital platforms. By identifying patterns, it can forecast audience behaviour, mitigate churn, and enhance overall engagement. In addition, it can automate the creation of highlight reels by detecting key moments in live sports or news broadcasts, significantly reducing post-production workloads.



### Global Case Studies

## tvone

**TvOne<sup>140</sup>**  
TvOne, a free-to-air news broadcaster headquartered in East Jakarta, has introduced three (3) virtual AI-powered news presenters named Nadira, Karni, and Syasya.

139. Ridwan Alawi, TVOne Kenalkan 3 Presenter AI, Media, Ketik News, 25 April 2023, <<https://www.ketiknews.id/news/3018567566/tvone-kenalkan-3-presenter-ai-media-pertama-berbasis-ai-di-indonesia>>

140. Ibid



**PBS<sup>141</sup>**

PBS, a United States-based broadcaster, leverages Machine Learning to boost viewer engagement and streamline operations through recommendation engines, predictive analytics, and metadata generation. Running on AWS Bedrock, this technology supports dynamic video recaps, content tagging, chatbots, creative workflows, and enhanced accessibility features.



**TV Azteca<sup>142</sup>**

TV Azteca, a Mexico-based broadcaster, leverages WSC Sports' machine learning-powered platform to automate real-time sports highlights and deliver personalised content, enhancing fan engagement across digital channels.

**Malaysian Trends**

The adoption of AI in Malaysia can be considered medium, reflecting steady but targeted progress rather than full-scale transformation. Broadcasters are gradually integrating NLP to enable automated content creation, language translation, and voice generation, which streamlines news production and enhances audience engagement. At the same time, Machine Learning is being applied to automate tagging, deliver predictive analytics, and support real-time monitoring, improving operational efficiency, and enabling more personalised viewing experiences.

The current implementation of AI in Malaysia includes:

**1. Adoption of Natural Language Processing**

- In Malaysia, broadcasters are actively exploring AI-driven NLP to enhance content creation and delivery. For example, Media Prima uses NLP to transform written articles into short video reels to boost audience engagement and has also introduced DJ Aina, the country's first AI-powered news personality.<sup>143</sup> RTM, on the other hand, employs the same method for voice cloning, script automation, and video translation to produce new multimedia content, presented through its AI avatars Aaron Lim and Che Rita. Astro Awani has likewise embraced this technology with the debut of its AI news anchors, Joon and Monica, who present the daily 7:45 PM news segment.<sup>144</sup>



**2. Adoption of Machine Learning**

- Malaysian broadcasters are also adopting Machine Learning to strengthen operations and improve audience experiences. Astro applies Machine Learning through Amagi's CloudPort and monitoring solutions to automate playout operations, support disaster recovery, and detect operational anomalies in real time.<sup>145</sup> Likewise, RTM uses Machine Learning for facial recognition, voice identification, and real-time translated subtitles to enhance accessibility on its RTMKlik app. Additionally, Media Prima employs a hybrid-cloud Media Asset Management system, Cantemo, powered by Machine Learning to automatically tag content with metadata, improve indexing, and make media files easier to search and retrieve.<sup>146</sup>



**In the short term, AI will disrupt the workforce by reshaping roles and functions across industries. However, in the long run, its ability to replicate and scale what we teach will significantly boost productivity. For example, enabling a small team to produce five (5) to six (6) articles instead of just one. This multiplier effect is set to transform outcomes across the economy.**



**Chief Operating Officer of REV Media Group, Nicholas Sagau**

141. Mikey Centrella, How PBS is using AI to improve processes and systems for stations, staff and viewers, Current, 11 October 2024, <[https://current.org/2024/10/how-pbs-is-using-ai-to-improve-processes-and-systems-for-stations-staff-and-viewers/?wallit\\_nosession=1](https://current.org/2024/10/how-pbs-is-using-ai-to-improve-processes-and-systems-for-stations-staff-and-viewers/?wallit_nosession=1)>

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143. Asia-Pacific Broadcasting Union, Media Prima set to introduce AI technology across its companies by year-end, <<https://www.abu.org.my/2024/10/07/media-prima-set-to-introduce-ai-technology-across-its-companies-by-year-end/>>; Media Prima Audio, Aina Sabrina: The Malaysia's First AI Radio DJ, 2023, <<https://www.mediaprima.audio/aina-sabrina-the-malaysias-first-ai-radio-dj/>>

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B

Digital

In the digital sphere, as in many other sectors, the Broadcasting sector is being shaped by the growing influence of cloud computing, big data analytics, and immersive technologies such as augmented and virtual reality.

Global Trends

The Broadcasting sector is experiencing global trends that are taking shape in the following key areas:

1. Cloud Computing and Big Data Analytics

- Globally, broadcasting companies are fully embracing cloud-based live production tools, enabling them to assemble content into sequential schedules or playlists with greater efficiency.<sup>147</sup> Broadcasters use platforms such as AWS to ingest, move, and retrieve television content within the cloud, streamlining production and distribution.<sup>148</sup> At the same time, big data analytics is being applied to analyse vast amounts of information from multiple sources to gain deeper insights into audience behaviour.<sup>149</sup> These insights are used to optimise revenue strategies by aligning pricing and fees with consumer patterns, while in sports broadcasting, data analytics enhances the depth of coverage and strengthens viewer engagement.<sup>150</sup>

2. Augmented Reality in Broadcasting

- Virtual reality (VR) and augmented reality (AR) are integrated directly into the production process to create immersive and interactive visual environments. Studios use virtual backdrops and 3D graphics projected onto large LED walls or composited in real time, which allows seamless blending of real-world and virtual elements on camera. In addition, AR overlays add dynamic graphics and information into live broadcasts, such as statistics, scores, or visual effects, so they appear to interact naturally with the studio space or presenters. These technologies enable production teams to change scenes instantly, visualise complex data, and enhance storytelling without the need to physically rebuild sets or locations, resulting in a more engaging viewer experience.<sup>151</sup>



Global Case Studies



Fox News Channel<sup>152</sup>

FOX, a United States-based company, developed MediaCloud on AWS to process and distribute programming with greater functionality and speed, achieving an industry first by delivering uncompressed live video with zero redundancy.

147. Paul Clemens Murschetz and Daniela Schlütz, Big Data And Television Broadcasting. A Critical Reflection On Big Data's Surge To Become A New Techno-Economic Paradigm and Its Impacts on the Concept of the Addressable Audience, Ediciones Universidad de Salamanca, 22 October 2018

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152. AWS, Fox on AWS, <<https://aws.amazon.com/solutions/case-studies/innovators/fox/>>



**NBC<sup>153</sup>**  
NBC, a United States-based company, employs big data analytics for audience segmentation and ad targeting by analysing consumer behaviours.



**ESPN<sup>154</sup>**  
ESPN, a United States-based company, uses its Catalyst Stage with Unreal Engine, Disguise XR, Ghostframe, Pixotope, and robotic camera systems to power virtual, augmented, and extended reality production, blending real and digital elements for flexible and high-quality content creation.

Malaysian Trends

The adoption of Digital in Malaysia can be considered medium, reflecting steady but targeted progress rather than full-scale transformation. In line with global trends, Malaysia is also embracing big data analytics as well as AR and VR.

The current implementation of Digital in Malaysia includes:

1. Adoption of Big Data Analytics

- Astro Group is utilising Microsoft Azure cloud technology to explore Digital Customer Profiling powered by big data analytics, enabling the company to automatically understand consumer interests in real time. This system predicts viewer preferences with high statistical accuracy, allowing Astro to deliver highly personalised and relevant content while users are still on its platforms, such as Stadium Astro.<sup>155</sup> Media Prima, on the other hand, adopts Insider's Instagram-style personalisation platform to refine content based on visitor behaviour and preferences, tracking interactions such as article clicks, time spent, and preferred authors to provide customised homepage content and automated browser push notifications.<sup>156</sup> Also, TV Al Hijrah applies big data analytics through its AlHijrah Plus (AH+) OTT platform to improve personalisation and content accessibility by analysing viewing habits and tailoring recommendations to individual interests.<sup>157</sup> Furthermore, RTMKlik has enhanced its OTT service by migrating to Amazon Web Services cloud technology, using big data analytics to speed up content creation and distribution while scaling seamlessly to accommodate growing viewer demand.<sup>158</sup>

153. Bharani Adithya, Media and Entertainment Industry Using Big Data, Nasscom Community, 11 October 2022, <<https://community.nasscom.in/communities/data-science-ai-community/media-and-entertainment-industry-using-big-data>>

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158. AWS, RTM confidently handles 29% surge in viewership after scaling its infrastructure with AWS, 2023, <<https://aws.amazon.com/solutions/case-studies/video-case-rtm/>>

2. Adaptation of AR/VR

- Astro Production integrates cameras with virtual 3D sets that are mapped onto green walls covering the entire studio space, creating immersive environments designed by its Design+Motion team.<sup>160</sup> Building on these innovations, Radio RTM combines AR and VR with blockchain and AI technologies to provide a more interactive and engaging audience experience. In the same spirit of advancing immersive content, Media Prima is working with Celcom Axiata and LG Uplus Corp to explore 5G-enabled services in augmented and virtual reality, supporting the delivery of both digital Korean entertainment and locally produced content.<sup>161</sup>

C Green Economy

The Green Economy has become an increasingly important focus, especially globally, driven by growing consumer demand for sustainability. In response, broadcasting companies are adopting carbon tracking and energy-efficient technologies to lower energy consumption and reduce operational costs.

Global Trends

Building on this momentum, the Broadcasting sector is seeing real-world shifts in how sustainability goals are being implemented. Key trends include carbon emission tracking and energy efficient technologies.

1. Carbon Emissions Tracking<sup>159</sup>

- Broadcasting companies are also tracking greenhouse gas emissions from production, transmission, logistics, and operations by using internal systems together with verified external data sources. Emissions are measured in CO<sub>2</sub> equivalents and categorised by Scope 1 for direct emissions, Scope 2 for energy use, and Scope 3 for factors such as supply chain and travel. Industry-specific tools such as Albert and EcoProd are used to calculate emissions from television and film production activities, enabling broadcasters to reduce their environmental impact, meet ESG goals, and align with investor and regulatory expectations.

2. Energy-efficient Technologies<sup>160</sup>

- Broadcasters are also adopting energy-efficient technologies such as LED lighting, energy-saving broadcast equipment, and efficient data centres to reduce power usage. Advanced HVAC and green ACMV systems, including high-performance chillers, are installed to optimise climate control in studios and other facilities. Studio designs now incorporate certified sustainable materials and integrated systems to minimise energy loss and reduce operational costs. Together, these measures help lower carbon emissions, cut utility expenses, and support long-term sustainability targets.

159. Astro Studios, Virtual Production, <<https://studios.astro.com.my/astro-productions/virtual-production>>

160. Malaysian Wireless, Celcom, LG UPlus & Media Prima collaborates on 5G Contents & Services, <<https://www.malaysianwireless.com/2021/10/celcom-lg-uplus-media-prima-5g-content-services/>>



Global Case Studies



RTL Group<sup>161</sup>

RTL Group, a Luxembourg-based company, measures its emissions in CO<sub>2</sub> equivalents by combining internal data, supplier inputs, and trusted databases. It also uses media-specific tools such as Albert and applies estimates when data is limited, with about 10% to 20% derived from direct supplier information.



Fox News Channel<sup>162</sup>

Fox News, a United States-based company, is actively adopting energy-efficient technologies by constructing LEED-certified buildings, upgrading to LED lighting and modern HVAC systems, and implementing smart solutions such as occupancy sensors and server virtualisation to reduce energy consumption.

Malaysian Trends

In the Malaysian Broadcasting sector, several Green Economy initiatives are underway in alignment with national and global sustainability policies. However, overall adoption remains relatively low, and current environmental efforts have not yet had a significant impact on job functions or core responsibilities. Astro Malaysia Holdings and Media Prima, for example, have taken a more proactive stance by aligning their sustainability strategies with the United Nations Sustainable Development Goals (UNSDGs), with a focus on optimising carbon emissions, waste management, and water use.

The current implementation of Green Economy in Malaysia includes:

1. Carbon Emission Tracking

- Media Prima tracks its carbon emissions with the help of a qualified carbon manager, Unravel Carbon, using an AI-based emissions tracking platform together with ESGTech, a sustainability data management system.<sup>163</sup> Astro, on the other hand, measures its carbon footprint using certified carbon calculators such as MGTC and USEPA tools to quantify and report emission reductions from initiatives like solar energy adoption, allowing clear and data-driven communication of its sustainability impact.<sup>164</sup>

2. Energy-efficient Technology<sup>165</sup>

- Media Prima launched Project Serumah, an initiative to consolidate its business operations at Balai Berita while embedding sustainability and ESG principles. By centralising activities within Balai Berita, the company is able to share resources such as space, lighting, and air-conditioning, allowing it to optimise and manage electricity usage more effectively.

161. RTL, Sustainability Report, 2024, <<https://company.rtl.com/export/sites/rtlunited/.galleries/downloads/Sustainability-report-2024.pdf>>

162. Fox Corporation, Fox Forward Corporate Social Responsibility Report, 2023, <<https://media.foxcorporation.com/wp-content/uploads/prod/2023/08/23105847/FOX-CSR-Report-2023.pdf>>

163. Media Prima, The Next Step: Sustainability Report 2024, 2024, <<https://www.mediaprima.com.my/annual-report-2024>>

164. Astro, Responsible environmental management, <<https://corporate.astro.com.my/esg/environment#NominationRemuneration>>

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Chapter 4.2:

# Key Findings

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# Overview of Roles and Skills



To comprehensively address the impact of AI, Digital, and Green Economy on the Malaysian workforce, it is crucial to first establish a clear and thorough understanding of the Broadcasting sector's value chain and its job functions.

| Segments                                                                                                                                                                                                                                                              | Job Clusters                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Production</b><br>Encompasses the creation, planning, and execution of content, including editorial, creative, on-air, post-production, and programming activities, to ensure the seamless delivery of broadcasts across television, radio, and digital platforms. | <b>Production and Editorial</b><br>Oversees the planning, scripting, and coordination of broadcast content.           |
|                                                                                                                                                                                                                                                                       | <b>Creative and Design</b><br>Develops visual elements such as graphics, sets, and branding for broadcast materials.  |
|                                                                                                                                                                                                                                                                       | <b>Post-production and Editing</b><br>Edits and assembles video and audio content into final broadcast-ready formats. |
|                                                                                                                                                                                                                                                                       | <b>On-Air Personality/Announcer</b><br>Delivers live or recorded content as hosts, DJs, or news presenters.           |

|                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Technical</b><br>Encompasses the operation, maintenance, and management of equipment required for filming, sound, lighting, transmission, and post-production, ensuring that the technical aspects of broadcasting, including the quality of visuals, sound, and transmission integrity, are executed flawlessly across television, radio, and digital platforms. | <b>Technical Crew</b><br>Operates cameras, lighting, and sound equipment during production.                       |
|                                                                                                                                                                                                                                                                                                                                                                      | <b>Technical Operations and Transmission</b><br>Manages broadcast systems and ensures smooth signal transmission. |

| Segments                                                                                                                                                                                                                                  | Job Clusters                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Sales and Advertising</b><br>Encompasses the commercial functions responsible for generating revenue through the sale of airtime, sponsorships, branded content, digital ads, and partnerships across TV, radio, and online platforms. | <b>Sales Strategy &amp; Revenue Planning</b><br>Crafts strategies to maximise revenue from advertising and sponsorships.      |
|                                                                                                                                                                                                                                           | <b>Sponsorship &amp; Brands Integration</b><br>Handles brand partnerships and integrates sponsored content into broadcasts.   |
|                                                                                                                                                                                                                                           | <b>Media Sales &amp; Client Management</b><br>Sells advertisement space and maintains relationships with advertising clients. |
|                                                                                                                                                                                                                                           | <b>Advertisement Operations &amp; Scheduling</b><br>Manages the scheduling and placement of advertisements across platforms.  |

|                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Support</b><br>Encompasses all administrative, logistical, scheduling, compliance, and managerial tasks that support the seamless operation of the broadcasting process, assisting both production and technical teams by managing responsibilities such as programme scheduling, rights management, and legal and compliance adherence. | <b>Broadcast Support Service</b><br>Provides administrative, legal, human resources,, and financial support for broadcast operations. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

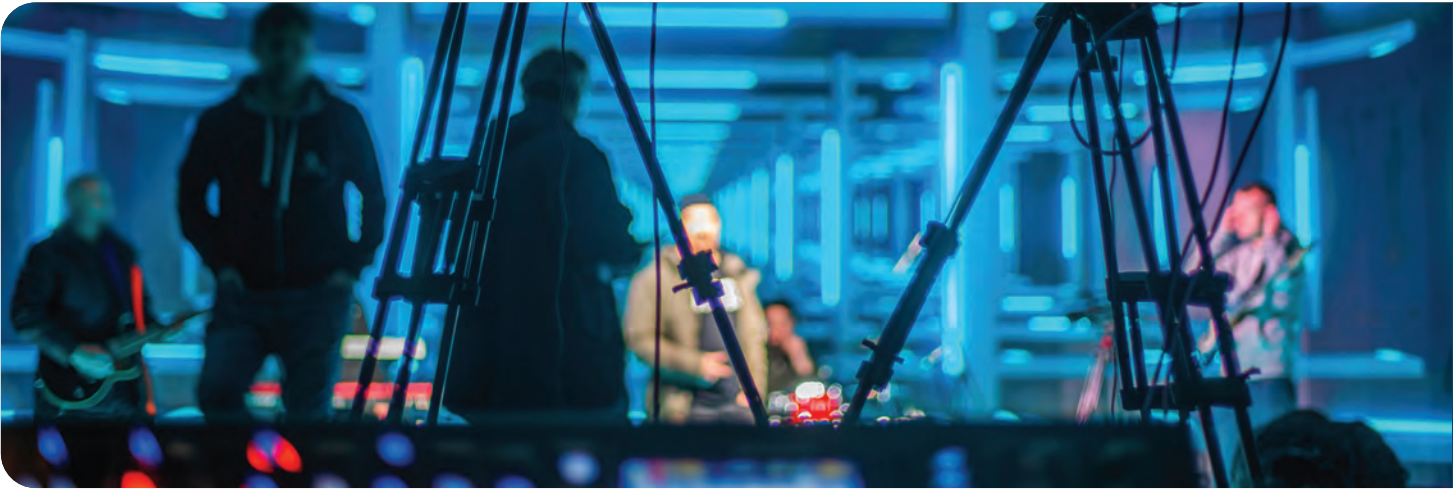
## Consolidated Job Clusters, Roles, and Skills in Broadcasting Sector

|                                                             |                                                      |                                                             |                                                               |
|-------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|
| 11 Job Clusters                                             |                                                      |                                                             |                                                               |
| <b>Ad Operations &amp; Scheduling</b><br>(2 job roles)      | <b>Broadcast Support Services</b><br>(7 job roles)   | <b>Content Production and Programming</b><br>(19 job roles) | <b>Creative and Design</b><br>(7 job roles)                   |
| <b>Media Sales &amp; Client Management</b><br>(2 job roles) | <b>On-Air Personality/Announcer</b><br>(2 job roles) | <b>Post-Production and Editing</b><br>(5 job roles)         | <b>Sales Strategy &amp; Revenue Planning</b><br>(3 job roles) |
| <b>Sponsorship &amp; Brand Integration</b><br>(6 job roles) |                                                      | <b>Technical Crew</b><br>(7 job roles)                      | <b>Technical Operations and Transmission</b><br>(8 job roles) |
| 68 Job Roles*                                               |                                                      |                                                             |                                                               |



| 43 Skills Clusters                                                           |                                                            |                                                                                |                                                          |
|------------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------|
| Categorised into 41 specific skill clusters and two (2) basic skill clusters |                                                            |                                                                                |                                                          |
| Specific Skills                                                              |                                                            |                                                                                |                                                          |
| <b>Analytics and Customer Insights</b><br>(1 skill)                          | <b>Automation and Robotics</b><br>(2 skills)               | <b>Business Operation Management</b><br>(5 skills)                             | <b>Branding, Sales and Marketing</b><br>(19 skills)      |
| <b>Business Development and Strategy</b><br>(2 skills)                       | <b>Conceptualisation</b><br>(2 skills)                     | <b>Content Post-Production</b><br>(12 skills)                                  | <b>Content Strategy and Planning</b><br>(1 skill)        |
| <b>Costume, Hair and Make-up</b><br>(8 skills)                               | <b>Customer Service and Experience</b><br>(4 skills)       | <b>Customer, Vendor and Stakeholder Management</b><br>(5 skills)               | <b>Data Development and Implementation</b><br>(8 skills) |
| <b>Engineering and Maintenance</b><br>(11 skills)                            | <b>General Business Management</b><br>(2 skills)           | <b>Health, Safety, and Environment (HSE)</b><br>(7 skills)                     | <b>Journalism</b><br>(1 skill)                           |
| <b>Legal and Regulatory</b><br>(2 skills)                                    | <b>Manufacturing and Production</b><br>(1 skill)           | <b>Marketing</b><br>(1 skill)                                                  | <b>Media</b><br>(2 skills)                               |
| <b>Media Technology and Operations</b><br>(8 skills)                         | <b>People Management and Development</b><br>(5 skills)     | <b>Production and Direction</b><br>(4 skills)                                  | <b>Production Design and Art</b><br>(5 skills)           |
| <b>Production Technical Services</b><br>(14 skills)                          | <b>Products and Services</b><br>(5 skills)                 | <b>Professional Practice</b><br>(1 skill)                                      | <b>Project and Process Management</b><br>(3 skills)      |
| <b>Quality Management</b><br>(3 skills)                                      | <b>Research and Development</b><br>(2 skills)              | <b>Risk Management, Compliance, and Governance</b><br>(9 skills)               | <b>Script and Story Development</b><br>(4 skills)        |
| <b>Software Development and Implementation</b><br>(8 skills)                 | <b>Supply Chain and Logistics Management</b><br>(3 skills) | <b>Talent Performance</b><br>(3 skills)                                        | <b>Technical Design and Architecture</b><br>(7 skills)   |
| <b>Technology Management</b><br>(6 skills)                                   | <b>VFX, Animation &amp; Design</b><br>(3 skills)           | <b>Virtual Production (VP) / In-Camera Visual Effects (ICVFX)</b><br>(1 skill) | <b>Visual Graphics</b><br>(1 skill)                      |
| <b>Warehouse and Inventory Management</b><br>(1 skill)                       |                                                            |                                                                                |                                                          |
| Basic Skills                                                                 |                                                            |                                                                                |                                                          |
| <b>Innovation and Delivery</b><br>(10 skills)                                |                                                            | <b>Social Intelligence</b><br>(6 skills)                                       |                                                          |
| <b>208 Skills</b>                                                            |                                                            |                                                                                |                                                          |
| Which comprises 192 Specific Skills and 16 Basic Skills                      |                                                            |                                                                                |                                                          |

# Consolidated Job Clusters and Roles in the Broadcasting Sector



The long-term effectiveness and resilience of Malaysia's Broadcasting sector depend on a detailed understanding of its key job clusters and the specific roles that drive its operations. Gaining clarity on the responsibilities and core skill sets within these clusters is essential for evaluating the impact of emerging technologies and sustainability priorities, as well as anticipating future workforce demands.

11 job clusters and 68 roles have been identified for the Broadcasting sector.

| Job Clusters                                     | Roles                                                                     |                                      |
|--------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------|
| <b>Advertisement Operations &amp; Scheduling</b> | 1. Head / Manager - Ad Operations & Scheduling                            | 2. Traffic Scheduling Executive      |
| <b>Broadcast Support Services</b>                | 1. Head of Radio Operations / Head of Television Operations, Broadcasting | 4. Rights and Licensing Manager      |
|                                                  | 2. Media Asset Management (MAM) Manager                                   | 5. Web Developer                     |
|                                                  | 3. Legal Affairs Executive                                                | 6. Transmission Log Coordinator      |
|                                                  |                                                                           | 7. Outside Broadcast Facility Driver |
| <b>Content Production &amp; Programming</b>      | 1. Program Researcher                                                     | 10. Director/ Producer               |
|                                                  | 2. Head Scriptwriter / Scriptwriter                                       | 11. Assistant Director               |
|                                                  | 3. Junior Scriptwriter / Junior Writer                                    | 12. Assistant Producer               |
|                                                  | 4. Content Strategist                                                     | 13. Radio Producer                   |
|                                                  | 5. Senior Broadcast Journalist/ Broadcast Journalist                      | 14. Show Producer                    |
|                                                  | 6. Junior Broadcast Journalist                                            | 15. Music Director                   |
|                                                  | 7. Editor in Chief/ Deputy Editor In Chief                                | 16. Production Manager               |
|                                                  | 8. Editor                                                                 | 17. Production Assistant             |
|                                                  | 9. Digital Content Director/ Producer                                     | 18. Floor Manager                    |
|                                                  |                                                                           | 19. Voice- over Talent/ Narrator     |

# Consolidated job clusters and roles in the Broadcasting Sector (Continued)

| Job Clusters                        | Roles                                               |                                                                 |
|-------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------|
| Creative & Design                   | 1. Creative Director                                | 5. Beautician/ Make-Up Artist                                   |
|                                     | 2. Graphic Designer                                 | 6. Senior Copywriter                                            |
|                                     | 3. Production Artist/ Designer                      | 7. Copywriter                                                   |
|                                     | 4. Assistant Wardrobe                               |                                                                 |
| Media Sales & Client Management     | 1. Head of Sales/ Sales Director                    | 2. Sales Executive/ Manager                                     |
| On-Air Personality/ Announcer       | 1. Radio Announcer/ Deejay/ Radio Personality       | 2. Television Announcer/ Compere/ Host/ News Anchor/ Newscaster |
| Post-Production & Editing           | 1. Post-Production Supervisor/ Assistant            | 3. Compliance Editor                                            |
|                                     | 2. Video/ Visual Editor                             | 4. Sound Editor/ Sound Engineer                                 |
|                                     |                                                     | 5. Subtitled                                                    |
| Sales Strategy & Revenue Planning   | 1. Head / Manager - Analytics and Customer Insights | 3. Corporate Strategy Executive                                 |
|                                     | 2. Analyst – Analytics and Customer Insights        |                                                                 |
| Sponsorships & Brand Integration    | 1. Head of Marketing/ Marketing Director            | 4. Social Media Executive                                       |
|                                     | 2. Marketing Executive/ Manager                     | 5. Social Media Manager                                         |
|                                     | 3. Promo Producer                                   | 6. SEO Specialist (Search Engine Optimisation)                  |
| Technical Crew                      | 1. Technical Producer/ Director                     | 5. Lighting Technician/ Lighting Operator                       |
|                                     | 2. Technical Assistant                              | 6. Maintenance Technician                                       |
|                                     | 3. Camera Operator                                  | 7. Audio Engineer                                               |
|                                     | 4. Camera Control Unit Operator                     |                                                                 |
| Technical Operations & Transmission | 1. Incident Manager                                 | 6. Payout, Broadcast Platform Operations Engineer               |
|                                     | 2. Supervisor (Master Control Room)                 | 7. Broadcasting Engineer                                        |
|                                     | 3. Engineer (Master Control Room)                   | 8. Audio Visual Operator                                        |
|                                     | 4. Broadcast Network Engineer                       |                                                                 |
|                                     | 5. Broadcast Transmission Engineer                  |                                                                 |

# Skills Clusters and Skills

Two (2) basic skill clusters and 41 specific skills have been identified in the Broadcasting sector.

| Skills Category | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BASIC SKILLS    | Innovation and Delivery                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | <ul style="list-style-type: none"><li>Adaptability and Resiliency</li><li>Business Acumen</li><li>Change Management</li><li>Cognitive Skills</li><li>Critical Thinking</li></ul>                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"><li>Digital and AI Fluency</li><li>Innovative Thinking</li><li>Learning Agility</li><li>Planning and Organising</li><li>Sustainability Awareness</li></ul>                                                                                                                                                                                               |
| SPECIFIC SKILLS | Social Intelligence                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | <ul style="list-style-type: none"><li>Coaching and Mentoring</li><li>Communication</li><li>Conflict Management</li></ul>                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"><li>Empathy</li><li>Influencing and Negotiation</li><li>Teamwork and Collaboration</li></ul>                                                                                                                                                                                                                                                             |
|                 | Analytics and Customer Insights                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | <ul style="list-style-type: none"><li>Business Insights</li></ul>                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | Automation and Robotics                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | <ul style="list-style-type: none"><li>Automation Process Control</li></ul>                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"><li>Automation System Maintenance</li></ul>                                                                                                                                                                                                                                                                                                              |
|                 | Branding, Sales and Marketing                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                            |
|                 | <ul style="list-style-type: none"><li>Brand Campaign Management</li><li>Brand Guideline Development</li><li>Broadcast and Interactive Media Copywriting</li><li>Communications Channel Management</li><li>Content Writing and Editing</li><li>Customer Behaviour Analysis</li><li>Market Profiling</li><li>Market Research and Analytics</li><li>Marketing Campaign Management</li><li>Marketing Communications Plan Development</li></ul> | <ul style="list-style-type: none"><li>Mass Communications Management</li><li>Media Platforms Management</li><li>Media Strategy Development</li><li>Print Media Copywriting</li><li>Public Relations Campaign Management</li><li>Rules-Based Copy Editing</li><li>Sales Strategy and Execution</li><li>Sales Target Management</li><li>Visual Design and Communication Principles</li></ul> |



# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>Business Development and Strategy</b> <ul style="list-style-type: none"><li>Business Opportunities Development</li><li>Strategy Development and Implementation Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                      | <b>Business Operation Management</b> <ul style="list-style-type: none"><li>Access Control Management</li><li>Dashboard Creation and Visualisation</li><li>Guided Storytelling</li><li>Production Planning and Scheduling</li><li>Revenue Optimisation</li></ul>                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                      | <b>Conceptualisation</b> <ul style="list-style-type: none"><li>Concept Creation</li><li>Creative Execution</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | <b>Content Post-Production</b> <ul style="list-style-type: none"><li>Creative Video Editing</li><li>Creative Video Editing for Formats and Genres for Documentaries</li><li>Creative Video Editing for Formats and Genres for Fiction Narrative</li><li>Creative Video Editing for Formats and Genres for Non-scripted Formats</li><li>Digital Audio Workstation Sound Editing</li><li>Immersive Video Editing</li><li>Media File Formats Conformation</li><li>Sound Editing</li><li>Sound Mixing</li><li>Subtitle Timing and Syncing</li><li>Technical Video Editing</li><li>Video Editing</li></ul> |
|                                                                                                                                                                                                                      | <b>Content Strategy and Planning</b> <ul style="list-style-type: none"><li>Market Intelligence</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | <b>Costume, Hair and Make-up</b> <ul style="list-style-type: none"><li>Hair Cutting and Styling</li><li>Hair Image Design</li><li>Hair Perming and Straightening</li><li>Makeup Application</li><li>Makeup Image Design</li><li>Special Effects Makeup Application</li><li>Special Effects Makeup Material Attachment</li><li>Special Effects Makeup Material Construction</li></ul>                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>Customer Service and Experience</b> <ul style="list-style-type: none"><li>Customer Experience Design</li><li>Customer Profiling</li><li>Search Engine Optimisation (SEO)</li><li>Social Media Management</li></ul>                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                      | <b>Customer, Vendor, and Stakeholder Management</b> <ul style="list-style-type: none"><li>Account Management</li><li>Customer Acquisition and Retention Management</li><li>Customer Relationship Management</li><li>Stakeholder Management</li><li>Vendor Management</li></ul>                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | <b>Data Development and Implementation</b> <ul style="list-style-type: none"><li>Big Data Analytics</li><li>Data Literacy</li><li>Data Management</li><li>Data Science</li><li>Data Storyboarding</li><li>Data Strategy</li><li>Data Validation</li><li>Data Visualisation</li></ul>                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                      | <b>Engineering and Maintenance</b> <ul style="list-style-type: none"><li>Asset Preventive Maintenance Management</li><li>Basic Tool and Maintenance Equipment Proficiency</li><li>Condition Monitoring</li><li>Equipment and System Repair</li><li>Equipment and Systems Testing</li><li>Equipment Maintenance</li><li>Failure Diagnosis and Troubleshooting</li><li>System Monitoring and Control</li><li>System Monitoring and Diagnostics</li><li>Troubleshooting</li><li>Prompt Engineering</li></ul> |
|                                                                                                                                                                                                                      | <b>General Business Management</b> <ul style="list-style-type: none"><li>Budget Management</li><li>Resource Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | <b>Health, Safety, and Environment (HSE)</b> <ul style="list-style-type: none"><li>Emergency Management</li><li>Outside Broadcast Road Safety Management</li><li>Sanitation and Skin Hygiene Practices</li><li>Sustainable Business Practices</li><li>Transportation Incident Management</li><li>Workplace Safety and Health</li><li>Workplace Safety and Incident Management</li></ul>                                                                                                                   |
|                                                                                                                                                                                                                      | <b>Journalism</b> <ul style="list-style-type: none"><li>Social Media Content Creation and Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Legal and Regulatory                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Knowledge of Legal and Compliance</li><li>Legal and Regulatory Research</li></ul>                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | Manufacturing and Production                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Equipment Operation</li></ul>                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | Marketing                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Immersive Ad Placement Collaboration</li></ul>                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                      | Media                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Camera Operations for Live Shows</li><li>Language Proficiency</li></ul>                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                      | Media Technology and Operations                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Broadcast Infrastructure Design</li><li>Broadcast Infrastructure Installation</li><li>Broadcast Infrastructure Maintenance</li><li>IT Knowledge</li><li>Master Control Room Operations</li><li>Media Content Cataloguing</li><li>Media Data Management</li><li>Signal Processing</li></ul> |
|                                                                                                                                                                                                                      | People Management and Development                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Cultural Awareness and Sensitivity</li><li>Interviewing Techniques</li><li>Organisational Relationship Building</li><li>Organisational Change Management</li><li>People and Performance Management</li></ul>                                                                               |
|                                                                                                                                                                                                                      | Production and Direction                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Location Scouting and Management</li><li>Media Law and Compliance</li><li>Procurement for Production Operations</li><li>Production Operations</li></ul>                                                                                                                                    |
|                                                                                                                                                                                                                      | Production Design and Art                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Costume Construction and Tailoring</li><li>Costume Design and Conceptualisation</li><li>Fabric and Material Design</li><li>Production Design</li><li>Set Design</li></ul>                                                                                                                  |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Production Technical Services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>360 Degree Camera Operations</li><li>Camera Operations</li><li>Cranes, Remote Heads and Jibs Operations</li><li>Creative Camera Operations</li><li>High Speed Camera Operations</li><li>Lighting Operations in Digital Lighting Control</li><li>Multi-Camera Operations</li><li>Sound Design and Creation</li><li>Sound Recording Operations</li><li>Stabilised Camera Operations</li><li>Studio Technical Production</li><li>Technical Camera Operations</li><li>Vehicle Camera Operations</li><li>Visual Style Development</li></ul> |
|                                                                                                                                                                                                                      | Products and Services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Demand and Supply Analysis</li><li>Digital Marketing</li><li>Marketing</li><li>Network Administration and Maintenance</li><li>Product Advisory</li></ul>                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | Professional Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Ethics, Values and Legislation</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | Project and Process Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Permit Management</li><li>Project Feasibility Assessment</li><li>Project Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | Quality Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Attention to Detail</li><li>Audit Compliance</li><li>Technical Inspection</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                      | Research and Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Ethical Reporting</li><li>Research and Information Synthesis</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                      | Risk Management, Compliance, and Governance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Audit and Compliance Strategy Development</li><li>Business Continuity Management</li><li>Business Risk Management</li><li>Compliance Reporting</li><li>Data Ethics</li><li>Data Privacy and Security</li><li>Ethical Judgement</li><li>Policy Implementation and Revision</li><li>Regulatory Compliance</li></ul>                                                                                                                                                                                                                      |



# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>Script and Story Development</b> <ul style="list-style-type: none"><li>Creative Storytelling</li><li>Narrative Design</li><li>Script Comprehension and Interpretation</li><li>Scriptwriting</li></ul>                                                                                                                                                                                                   |
|                                                                                                                                                                                                                      | <b>Software Development and Implementation</b> <ul style="list-style-type: none"><li>Advanced Programming Language</li><li>Network and Systems Administration</li><li>Network Security</li><li>Networking Fundamentals</li><li>Programming, Coding and Scripting</li><li>Switches and Routers Configuration</li><li>System Integration and Configuration</li><li>TCP/IP and Networking Protocols</li></ul> |
|                                                                                                                                                                                                                      | <b>Supply Chain and Logistics Management</b> <ul style="list-style-type: none"><li>Logistic Management</li><li>Route Planning and Optimisation</li><li>Transportation Management</li></ul>                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                      | <b>Talent Performance</b> <ul style="list-style-type: none"><li>Acting For Camera</li><li>Microphone Technique</li><li>Voice Acting</li></ul>                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | <b>Technical Design and Architecture</b> <ul style="list-style-type: none"><li>Components and Parts Design</li><li>Digital Image Production</li><li>Image Development and Animation</li><li>Photographic Images Manipulation</li><li>Visual Collaterals Production</li><li>Website Design</li><li>Website Performance Optimisation</li></ul>                                                               |
|                                                                                                                                                                                                                      | <b>Technology Management</b> <ul style="list-style-type: none"><li>Audio-to-Text Transcription</li><li>Infrastructure Strategy</li><li>IT Asset Management</li><li>Platform Knowledge and Deployment</li><li>Technical Support</li><li>Machine Learning</li></ul>                                                                                                                                          |
|                                                                                                                                                                                                                      | <b>VFX, Animation &amp; Design</b> <ul style="list-style-type: none"><li>Motion Graphics</li><li>Real-Time Rendering Optimisation</li><li>Render Management</li></ul>                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                            |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>Virtual Production (VP) / In-Camera Visual Effects (ICVFX)</b> <ul style="list-style-type: none"><li>Colour Grading</li></ul> |
|                                                                                                                                                                                                                      | <b>Visual Graphics</b> <ul style="list-style-type: none"><li>Digital Lighting</li></ul>                                          |
|                                                                                                                                                                                                                      | <b>Warehouse and Inventory Management</b> <ul style="list-style-type: none"><li>Inventory Management</li></ul>                   |





# In-Demand Skills



In Malaysia’s Broadcasting sector, the growing use of AI and digital tools is increasingly supporting how content is created, edited, and scripted. Broadcasters are increasingly turning to platforms such as ChatGPT, Jasper, Sudowrite, and Grammarly to manage repetitive tasks like writing summaries, generating subtitles, and translating scripts. These technologies help streamline production workflows and allow human talent to concentrate on higher-value responsibilities such as setting editorial direction, reviewing AI outputs, and ensuring alignment with audience expectations and brand voice. Even with these advances, the skills most in demand are not dominated by AI or digital expertise because these technologies mainly function as aids that enhance efficiency while leaving critical judgment and creativity in human hands. While AI can now produce initial drafts quickly, content writing and editing remain essential capabilities. Professionals must still review and refine AI-generated material, particularly when making editorial decisions or shaping programme strategy. In Malaysia’s multilingual and culturally diverse broadcasting environment, this means assessing tone, structure, and factual accuracy with precision. As a result, the industry places a premium on practitioners who can blend creative judgment, cultural sensitivity, and strategic oversight with the effective use of AI tools through prompt engineering and critical evaluation.

Alongside these digital developments, broadcasting continues to rely on a distinct set of specialised technical skills that are rarely found in other industries. For example, on-camera makeup techniques are designed to withstand intense studio lighting and high-definition video capture, ensuring a consistent on-screen appearance. Camera operators must master multi-camera switching, framing and positioning shots, tracking subjects during live recordings, and coordinating closely with the production team to maintain smooth, synchronised output. Lighting technicians require deep expertise in broadcast-specific setups, interpreting and executing lighting design plans, installing and maintaining

lighting fixtures, and programming lighting consoles for colour changes and scene transitions. These capabilities are integral to live production environments and remain critical even as AI and digital tools gain prominence.

At the same time, audience behaviour is shifting as viewers increasingly expect on-demand content across multiple platforms. This drives demand for skills in media strategy development, platform deployment, and interactive copywriting, prompting broadcasters to expand their presence on YouTube, TikTok, and OTT services such as Tonton, Astro Go, and RTMKlik to reach wider and younger audiences. Ethical content creation remains a key concern in Malaysia’s diverse cultural landscape, requiring broadcasters to respect local values and comply with regulations such as the Content Code and the Communications and Multimedia Act 1998. Faster production cycles and the rise of AI-generated content make editorial oversight even more essential to ensure all output remains legally compliant, culturally sensitive, and free from bias, which makes ethical reporting, regulatory awareness, and critical thinking essential skills.

Workplace safety is also fundamental, as production teams frequently handle lighting, cameras, cables, and other broadcast equipment that demand careful setup and operation. Following safety protocols helps prevent accidents and maintain uninterrupted production. Sustainability practices, meanwhile, remain relatively basic and routine, with broadcasters focusing on measures such as replacing conventional lighting with energy-efficient LED bulbs and adopting paperless workflows through digital scripts, cloud storage, and online systems. Although these steps improve operational efficiency, they are now standard across industries and no longer signal strategic progress toward sustainability. AI and Digital skills are generally embedded within existing job functions rather than being treated as standalone specialist skill categories in the Broadcasting sector. AI is predominantly used as a supporting tool rather than the primary function. For instance, content writing and editing remains a core skill that requires human mastery, while tools such as ChatGPT or Grammarly serve merely to assist the process. The ability to craft narratives, ensure factual accuracy, adjust tone, and apply sound editorial judgment continues to depend on individual skill. In addition, ethical and regulatory compliance is a critical part of the skill set, as the industry operates within strict content standards and legal frameworks. This reflects a broader trend across various roles, where AI and digital tools support efficiency, but the main value remains grounded in human capability and responsibility.

The top ten (10) basic skills and top ten (10) specific skills are as follows:

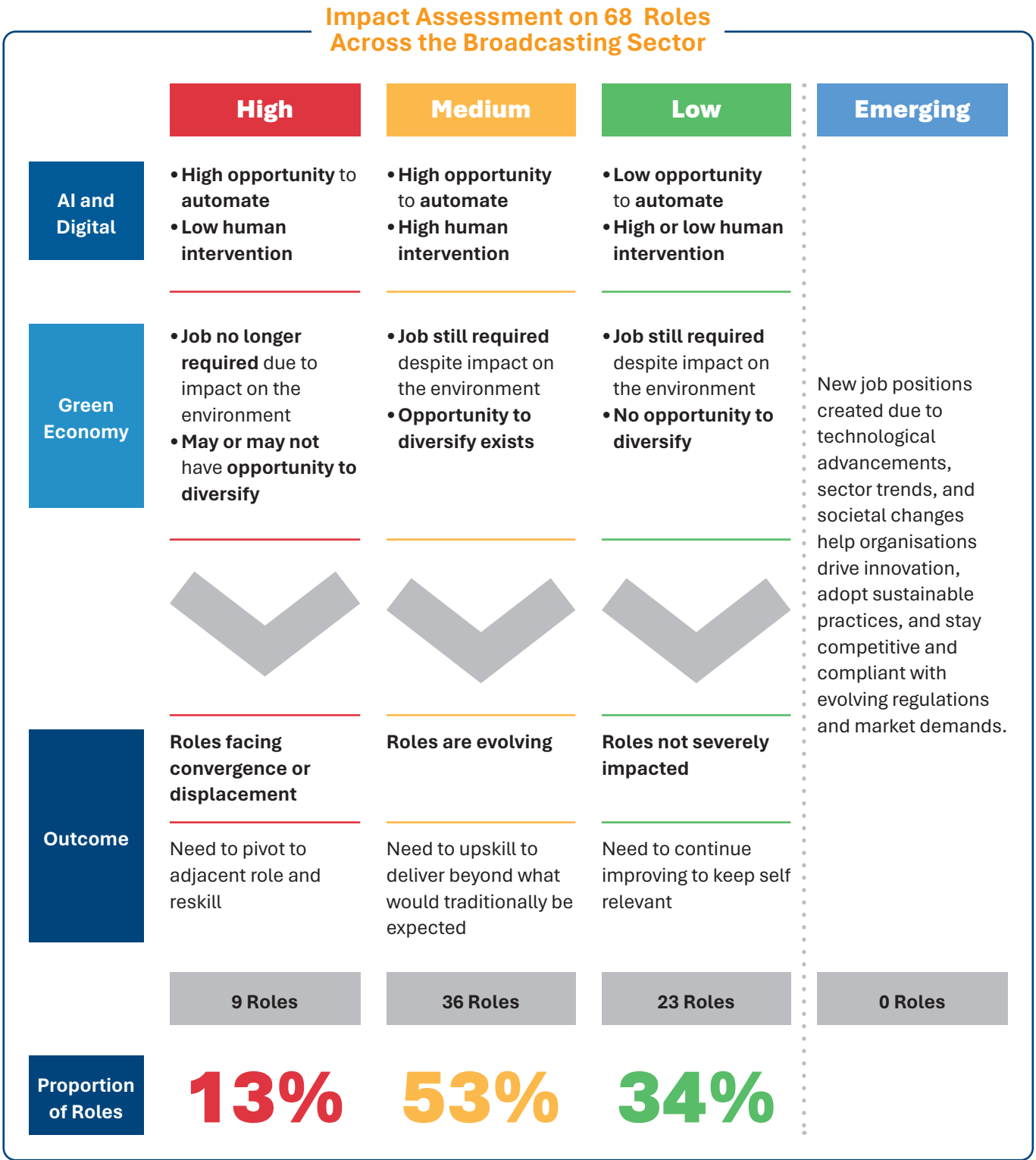
| Skills Category        | Skills Clusters                               |                                  |
|------------------------|-----------------------------------------------|----------------------------------|
| Top 10 Basic Skills    | Innovation and Delivery                       |                                  |
|                        | • Communication                               | • Digital and AI Fluency ●       |
|                        | • Adaptability and Resiliency                 | • Learning Agility               |
|                        | • Planning and Organising                     | • Cognitive Skills               |
|                        | • Critical Thinking                           | • Innovative Thinking            |
|                        | Social Intelligence                           |                                  |
|                        | • Teamwork and Collaboration                  | • Empathy                        |
| Top 10 Specific Skills | • Prompt Engineering                          | • Media Platforms Management     |
|                        | • Platform Knowledge and Deployment ●         | • Regulatory Compliance          |
|                        | • Broadcast and Interactive Media Copywriting | • Stakeholder Management         |
|                        | • Content Writing and Editing                 | • Workplace Safety and Health    |
|                        |                                               | • Ethics, Values and Legislation |
|                        |                                               | • Media Strategy Development     |

- AI / Digital Skills
- Green Skills



# Roles and Skills Analysis by Impact Level

The study identified a total of 68 existing roles that are integral to maintaining the standards and operational efficiency of the Broadcasting sector. Some of these roles are rapidly transforming, others are evolving more gradually, while many remain core to ensuring operational continuity. These roles are categorised into high, medium, and low impact roles. Unlike other sectors, the study did not identify any emerging roles within the Broadcasting sector. Nine (9) roles are classified as high impact, while the majority, 36 roles, are categorised as medium impact. The remaining 23 roles fall under the low impact category. These roles indicate the direction of future skills demand and highlight areas where workforce development must evolve to support continued innovation and sector resilience.



# Overview of Roles by Impact Level

Based on insights gathered through workshops and industry engagements, broadcasters provided high-level assessments of how AI, digital technologies, and the Green Economy are influencing their existing roles. This feedback informed the classification of roles by impact level and guided the analysis of how technological advancements and sustainability initiatives are reshaping workforce needs. The study further maps key career pathways and highlights the essential skills required for Malaysia’s broadcasting workforce to stay competitive.

| HIGH                                                                                                                                                                                                                                       | MEDIUM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LOW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9 Roles                                                                                                                                                                                                                                    | 36 Roles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 23 Roles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1. Program Researcher<br>2. Junior Scriptwriter/ Junior Writer<br>3. Assistant Director<br>4. Graphic Designer<br>5. Copywriter<br>6. Video/ Visual Editor<br>7. Subtitler<br>8. Social Media Executive<br>9. Traffic Scheduling Executive | 1. Head Scriptwriter / Scriptwriter<br>2. Content Strategist<br>3. Senior Broadcast Journalist/ Broadcast Journalist<br>4. Junior Broadcast Journalist<br>5. Editor in Chief/ Deputy Editor in Chief<br>6. Editor<br>7. Digital Content Director/ Producer<br>8. Director/ Producer<br>9. Assistant Producer<br>10. Radio Producer<br>11. Show Producer<br>12. Production Manager<br>13. Voice- over Talent/ Narrator<br>14. Creative Director<br>15. Production Artist/ Designer<br>16. Assistant Wardrobe<br>17. Senior Copywriter<br>18. Post-Production Supervisor/ Assistant<br>19. Sound Editor/ Sound Engineer<br>20. Radio Announcer/ DeeJay/ Radio Personality<br>21. Television Announcer/ Compere/ Host/ News Anchor/ Newscaster<br>22. Camera Operator<br>23. Camera Control Unit Operator<br>24. Incident Manager | 25. Supervisor (Master Control Room)<br>26. Analyst – Analytics and Customer Insights<br>27. Corporate Strategy Executive<br>28. Marketing Executive/ Manager<br>29. Promo Producer<br>30. SEO Specialist (Search Engine Optimisation)<br>31. Sales Executive/ Manager<br>32. Head/ Manager – Ad Operations & Scheduling<br>33. Head of Radio Operations / Head of Television Operations, Broadcasting<br>34. Media Asset Management (MAM) Manager<br>35. Web Developer<br>36. Transmission Log Coordinator                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1. Music Director<br>2. Production Assistant<br>3. Floor Manager<br>4. Beautician/ Make-Up Artist<br>5. Compliance Editor<br>6. Technical Producer/ Director<br>7. Technical Assistant<br>8. Lighting Technician/ Lighting Operator<br>9. Maintenance Technician<br>10. Audio Engineer<br>11. Engineer (Master Control Room)<br>12. Broadcast Network Engineer<br>13. Broadcast Transmission Engineer<br>14. Playout, Broadcast Platform Operations Engineer<br>15. Broadcasting Engineer<br>16. Audio Visual Operator<br>17. Head / Manager - Analytics and Customer Insights<br>18. Head of Marketing/ Marketing Director<br>19. Social Media Manager<br>20. Head of Sales/ Sales Director<br>21. Legal Affairs Executive<br>22. Rights and Licensing Manager<br>23. Outside Broadcast Facility Driver |

# Highly Impacted Roles and Career Pathways



The study has identified nine (9) roles within the Broadcasting sector that are highly impacted as AI and digital technologies increasingly replace manual tasks, reducing reliance on traditional human functions. 13% of broadcasting roles are highly impacted due to the automation of pre-production tasks such as content drafting, visual mock-ups, and scheduling coordination. These high-impact roles have a high potential for automation because of the availability of advanced technologies and the minimal need for human intervention. Many of these roles involve routine and repetitive tasks, such as data tagging, video editing, research synthesis, and summarisation, which makes them particularly vulnerable to automation by AI and digital tools. Advancements in AI and digital platforms, including ChatGPT, Perplexity, Adobe Firefly, and dashboard generators, allow core functions such as research, scripting, design, editing, and subtitling to be performed independently.

As automation takes over routine tasks, several positions are being consolidated or absorbed into senior roles that emphasise creative direction, strategic decision-making, and data-driven insights. High-impact roles are also evolving toward careers focused on strategic planning, audience analytics, and digital content delivery, transitioning from manual execution to responsibilities in content strategy, marketing, UX writing, campaign coordination, and data-driven storytelling. This transformation reflects a broader industry trend in which technology handles execution while human expertise increasingly drives creativity, strategy, and audience connection.

## Overview of Nine (9) Highly Impacted Roles

| Job Cluster                           | Roles                                                                                                                                             |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Content Production & Programming      | <ul style="list-style-type: none"><li>• Programme Researcher</li><li>• Junior Scriptwriter / Junior Writer</li><li>• Assistant Director</li></ul> |
| Creative & Design                     | <ul style="list-style-type: none"><li>• Graphic Designer</li><li>• Copywriter</li></ul>                                                           |
| Post-Production & Editing             | <ul style="list-style-type: none"><li>• Video/Visual Editor</li><li>• Subtitler</li></ul>                                                         |
| Sponsorship & Brand Integration       | <ul style="list-style-type: none"><li>• Social Media Executive</li></ul>                                                                          |
| Advertisement Operations & Scheduling | <ul style="list-style-type: none"><li>• Traffic Scheduling Executive</li></ul>                                                                    |



# Highly Impacted Roles Career Pathways

Highly Impacted Role

#01

Content Production & Programming Programme Researcher

With AI now capable of automating significant parts of content analysis and research, the Programme Researcher role is shifting toward a distributed responsibility, where research tasks are no longer confined to a single dedicated role.

**Job Purpose:**

- This role manages and conducts research projects using quantitative and qualitative methods to provide strategic insights that support content development and programming decisions.

| AI                                                                                                                                                                                          | DIGITAL SKILLS                                                                                                                                                          | GREEN SKILLS                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools like ChatGPT and Perplexity can independently handle research planning, data analysis, insight generation, and reporting.</p>       | <p><b>High Opportunity to Automate:</b></p> <p>Tools like Google Trends and CrowdTangle enable rapid, automated data and audience insight gathering.</p>                | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential, as environmental requirements do not alter its core job functions.</p> |
| <p><b>Low Human Intervention:</b></p> <p>With AI advancing in data verification and insight generation, research tasks, especially those that are routine, require minimal human input.</p> | <p><b>Low Human Intervention:</b></p> <p>Digital research tasks require minimal manual effort, giving teams quick access to insights without dedicated researchers.</p> | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                |



### Case Study

#### Media Prima – Automating Content Insights with AI and Digital<sup>166</sup>

Broadcasters are using digital tools such as Google Trends, CrowdTangle, and dashboards to automate audience analysis, while AI tools like large language models summarise trends, generate reports, and evaluate content relevance. As a result, routine research tasks such as data collection, coding interviews, and preparing insight decks are increasingly automated, reducing the reliance on Programme Researcher roles. In the Media Prima Digital case, Insider’s platform automates audience analysis and content recommendations, demonstrating how AI and digital tools are reshaping traditional research functions in broadcasting.

| Upskilling and Reskilling                                                                                                                                                                                                                      | Potential Career Pathways                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>Transferable Skills*</div> <ul style="list-style-type: none"><li>• Data Science ●</li><li>• Big Data Analytics ●</li><li>• Market Research and Analytics</li><li>• Data Management</li><li>• Research and Information Synthesis</li></ul> | <div>Possible Roles for Transition Within the Sector</div> <p><b>1. Sales &amp; Advertising: Analyst – Analytics and Customer Insights</b></p> <p>Enables market research and analytics by processing audience and content data, generating dashboards and KPIs, and providing insights to guide programming, marketing, and sales.</p>               |
| <div></div> <ul style="list-style-type: none"><li>• Big Data Analytics ●</li><li>• Stakeholder Management</li><li>• Ethical Judgement</li><li>• Attention to Detail</li></ul>                                                                  | <div>Possible Roles for Transition into Other Sectors</div> <p><b>1. Global Business Services: Procurement Analyst</b></p> <p>Analyse procurement data and market trends, support cost analysis and negotiations, develop dashboards and reports, and collaborate with stakeholders to optimise procurement strategies while ensuring efficiency.</p> |
| <div>Additional Skills*</div> <ul style="list-style-type: none"><li>• Data Validation ●</li><li>• Data Strategy ●</li><li>• Dashboard Creation and Visualisation</li></ul>                                                                     | <div></div> <ul style="list-style-type: none"><li>• Contract Management</li><li>• Cost Management</li><li>• Knowledge of Procurement Law and Compliance</li><li>• Risk Management</li><li>• Supplier Evaluation and Selection</li><li>• Supplier Relationship Management (SRM)</li></ul>                                                              |

#### The Evolving Role of a Programme Researcher<sup>167</sup>

What is observed today is that researching for a show is largely integrated into the responsibilities of producers, particularly for regular, day-to-day programmes. For high-level strategic or diplomatic events, external researchers are still engaged, based on necessity, to provide support before and after the event. They prepare talking points in advance to guide discussions and draft post-event summaries to help management and editors capture the key outcomes. Researchers also ensure that all content aligns with national priorities and diplomatic messaging, often requiring internal clearance before it is broadcast. For sector-specific programmes, experts from relevant fields, such as agriculture, may be consulted to provide deeper insights. This demonstrates that research work is becoming more targeted and flexible, rather than requiring a dedicated full-time position solely for research.

● AI / Digital Skills ● Green Skills \*Skills are non-exhaustive

166. Insider, Media Prima drives 525.71% uplift in average session duration with InStory, <<https://useinsider.com/case-studies/media-prima-digital/>>

167. Bernama, <[https://mrem.bernama.com/viewsm.php?idm=51433&utm\\_source=](https://mrem.bernama.com/viewsm.php?idm=51433&utm_source=)

# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#02

Content Production & Programming  
Junior Scriptwriter/Junior Writer

With the increasing adoption of AI writing and script-generation tools automating routine drafting and content structuring, the role of Junior Scriptwriter in the Broadcasting sector is shifting toward a distributed responsibility, where writing tasks are no longer confined to a single dedicated role.

Job Purpose:

- This role is responsible for supporting script development by conducting research, preparing draft scripts, verifying factual content, and assisting with script revisions and legal clearance documentation under the guidance of senior writers or producers.

| AI                                                                                                                                                                                                                                                                                   | DIGITAL SKILLS                                                                                                                                                                                                                                                                                                                                                                   | GREEN SKILLS                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b><br/>AI tools such as ChatGPT and Jasper can quickly generate storylines, dialogues, and even show segments.</p> <p><b>Low Human Intervention:</b><br/>Scriptwriting tasks need minimal human input, reducing manual drafting and checks.</p> | <p><b>High Opportunity to Automate:</b><br/>Tools like Celtx and Grammarly come in handy to streamline editing, while Trello manages deadlines and documents.</p> <p><b>Low Human Intervention:</b><br/>With the maturity of digital tools in managing timelines, tracking changes, and formatting scripts, many tasks can now be completed with minimal manual involvement.</p> | <p><b>Low Environmental Impact on the Role:</b><br/>This role remains essential, as environmental requirements do not alter its core job functions.</p> <p><b>Low Opportunity to Diversify:</b><br/>There is limited opportunity for this role to diversify.</p> |



| Upskilling and Reskilling                                                                                                                                                                                                                                                                                                                   | Potential Career Pathways                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Transferable Skills*</p> <ul style="list-style-type: none"><li>• Broadcast and Interactive Media Copywriting</li><li>• Ethical Reporting</li><li>• Ethics, Values and Legislation</li><li>• Prompt Engineering</li></ul>                                                                                                                 | <p>Possible Roles for Transition Within the Sector</p> <p><b>1. Content Production &amp; Programming: Content Strategist</b><br/>Develops and executes multi-platform content strategies that are aligned with brand goals, while balancing organic and paid content to grow audience engagement.</p> <p>Possible Roles for Transition into Other Sectors</p> <p><b>1. Information and Communication: User Experience Writer (UX Writer)</b><br/>Craft and creates user-friendly text for websites, apps, as well as digital products.</p> |
| <p>Additional Skills*</p> <ul style="list-style-type: none"><li>• Brand Campaign Management</li><li>• Brand Guideline Development</li><li>• Communications Channel Management</li><li>• Market Profiling</li><li>• Marketing Communications Plan Development</li><li>• Media Strategy Development</li><li>• Regulatory Compliance</li></ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>Transferable Skills*</p> <ul style="list-style-type: none"><li>• Content Writing and Editing</li><li>• Research and Information Synthesis ●</li><li>• Creative Storytelling</li><li>• Narrative Design</li><li>• Ethical Reporting</li><li>• Ethics, Values and Legislation</li></ul>                                                    | <p>Additional Skills*</p> <ul style="list-style-type: none"><li>• Data Literacy</li><li>• Customer Behaviour Analysis</li><li>• Search Engine Optimisation (SEO)</li><li>• User Experience Design ●</li><li>• User Interface and User Experience (UI/UX) Optimisation ●</li><li>• User Interface Design ●</li><li>• User Testing and Usability Testing ●</li></ul>                                                                                                                                                                         |

● AI / Digital Skills    ● Green Skills    \*Skills are non-exhaustive



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#02

Content Production & Programming  
Junior Scriptwriter/Junior Writer (Continued)



### Case Study

#### The Evolving Role of Junior Scriptwriters<sup>168</sup>

Broadcasters are progressively integrating AI tools such as ChatGPT and Jasper to assist with scriptwriting workflows. These tools support the creation of storylines, dialogue, and segment drafts, speeding up the overall script development process. At the same time, large language models are being employed to manage tasks like research, fact-checking, and metadata generation, increasingly automating core writing functions and lessening the reliance on junior-level scriptwriting roles.

168. Shaun Lim, Shaping the future: Why leveraging technologies & understanding what audiences want is key for APAC broadcasters, Asia-Pacific Broadcasting, 30 January 2025, <<https://apb-news.com/shaping-the-future-why-leveraging-technologies-understanding-what-audiences-want-is-key-for-apac-broadcasters/>>

| Upskilling and Reskilling                                                                                                        |                                                                                                                                                                                                                                                            | Potential Career Pathways                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                             | Additional Skills*                                                                                                                                                                                                                                         | Possible Roles for Transition into Other Sectors                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"><li>• Communications Channel Management</li><li>• Research and Information Synthesis</li></ul> | <ul style="list-style-type: none"><li>• Brand Campaign Management</li><li>• Brand Guideline Development</li><li>• Digital Marketing</li><li>• Partnership Management</li><li>• Social Media Marketing</li><li>• Sustainable Business Practices ●</li></ul> | <p><b>2. Wholesale and Retail Trade: Associate/ Assistant, Brand</b></p> <p>Assist in executing brand plans and campaigns, analyse market and consumer data, develop promotional materials, and support initiatives to enhance brand awareness, customer loyalty, and product visibility.</p> |
| <ul style="list-style-type: none"><li>• Research and Information Synthesis</li></ul>                                             | <ul style="list-style-type: none"><li>• Big Data Analytics ●</li><li>• Social Media Management</li><li>• Content Management</li><li>• Paid Search Engine Marketing</li><li>• Social Media Marketing</li><li>• Search Engine Optimisation (SEO)</li></ul>   | <p><b>3. Wholesale and Retail Trade: Executive, Retail Digital Marketing</b></p> <p>Design and implement digital marketing campaigns, manage website and social media content, analyse performance, and develop strategies to enhance customer engagement, brand presence, and sales.</p>     |

# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#03

Content Production & Programming Assistant Director

With evolving trends, automation is streamlining Assistant Director roles, enabling Directors to manage productions with reduced operational support.

**Job Purpose:**

- This role is responsible for coordinating production activities, managing shooting schedules, preparing call sheets, overseeing on-set logistics, and assisting in translating scripts into visual plans.

| AI                                                                                                                                                                                                     | DIGITAL SKILLS                                                                                                                                                                                                                                               | GREEN SKILLS                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools like Runway and Cuebric can generate storyboards, and analyse scenes, and translate scripts into visuals with minimal manual intervention.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools like StudioBinder, Trello, and Disguise xR play a role in automating scheduling and scene planning, allowing Directors to manage production tasks with minimal need for human intervention.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential as the environmental requirements in the industry does not change the job functions at the moment.</p> |
| <p><b>Low Human Intervention:</b></p> <p>Tasks are backend-focused, requiring minimal decision-making.</p>                                                                                             | <p><b>Low Human Intervention:</b></p> <p>Most coordination tasks are now automated or managed through dashboards, requiring little to no direct human involvement.</p>                                                                                       | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                                               |

### Case Study

**Automation’s Impact on Assistant Directors<sup>169</sup>**

Broadcasters are increasingly using digital tools such as StudioBinder and Trello to automate core production tasks, including scheduling, task management, and call sheet creation, which were traditionally the responsibility of Assistant Directors. In studio productions, platforms like Disguise xR provide real-time visualisation and scene planning, enabling Directors to oversee on-set coordination directly. As these technologies continue to advance, the Assistant Director role is becoming less essential, particularly in environments where intelligent, real-time digital systems can fully support both planning and execution.

169. Disguise, Disguise xR helps Malaysian TV deliver a national first on the country's Independence Day, <[https://www.disguise.one/sites/default/files/2023-11/Case%20Study\\_Broadcast\\_Malaysian%20National%20Independence%20Day.pdf](https://www.disguise.one/sites/default/files/2023-11/Case%20Study_Broadcast_Malaysian%20National%20Independence%20Day.pdf)>

| Upskilling and Reskilling                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                      | Potential Career Pathways                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                                                                                         | Additional Skills*                                                                                                                                                                                                                                   | Possible Roles for Transition Within the Sector                                                                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"><li>Media Platforms Management</li><li>Platform Knowledge and Deployment ●</li><li>Project Management</li><li>Visual Design and Communication Principles</li><li>Organisational Relationship Building</li><li>Prompt Engineering</li></ul> | <ul style="list-style-type: none"><li>Stakeholder Management</li><li>Workplace Safety and Health</li><li>Location Scouting and Management</li><li>Procurement for Production Operation</li></ul>                                                     | <p><b>1. Content Production &amp; Programming: Production Manager</b></p> <p>Responsible for managing TV production, schedules, and resources to ensure timely, high-quality content delivery.</p>                                                                                                                                          |
| <ul style="list-style-type: none"><li>Budget Management</li><li>Resource Management</li><li>Vendor Management</li></ul>                                                                                                                                                      | <ul style="list-style-type: none"><li>Events Planning and Management</li><li>Project Management</li><li>Stakeholder Management</li><li>Risk Management</li><li>Financial Planning, Analysis and Forecasting</li><li>Technology Application</li></ul> | Possible Roles for Transition into Other Sectors                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                      | <p><b>1. Tourism: Event Manager</b></p> <p>This role oversees end-to-end event execution, ensuring alignment with client objectives, timely delivery, budget compliance, and adherence to logistical and regulatory requirements. Involves strategic planning, stakeholder coordination, and continuous evaluation to improve outcomes.</p> |



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#04

Creative & Design  
Graphic Designer

With the rise of AI, Digital, and Green Economy, Graphic Designer roles are evolving into strategic and cross-sector creative pathways supported by AI and digital innovation.

Job Purpose:

- The Graphic Designer role is responsible for both set design and creating motion graphics to ensure that visual elements align with production requirements and enhance the storytelling process.

| AI                                                                                                                                                                                                    | DIGITAL SKILLS                                                                                                                                                                                                                 | GREEN SKILLS                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools like Runway ML, Kaiber, and Adobe Firefly automate creative tasks like backgrounds, animations, and effects, reducing manual design work.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Tools like SketchUp, AutoCAD, Blender, and After Effects automate key design tasks such as placing objects in a scene, creating 3D environments, and generating animations.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential as the environmental requirements in the industry does not change the job functions at the moment.</p> |
| <p><b>Low Human Intervention:</b></p> <p>AI-generated design assets are often production-ready, needing minimal human input or revision.</p>                                                          | <p><b>Low Human Intervention:</b></p> <p>Templates and generative tools create designs automatically once key options are set, needing minimal manual editing.</p>                                                             | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                                               |



Case Study

AI Transforming Graphic Design in Broadcasting<sup>170</sup>

AI tools such as Runway ML, Kaiber, and Adobe Firefly are increasingly automating motion graphics, background design, and visual effects, producing production-ready assets with minimal manual input. According to Noa Magrisso, an AI developer, AI can also generate real-time graphics or overlays for statistics, live updates, and interactive polls, enhancing audience engagement. Additionally, Peyton Thomas, a Product Manager, highlights that AI is being used to trigger graphics via voice prompts, further reducing the need for manual execution of visual elements during production. These developments illustrate how routine tasks traditionally performed by Graphic Designers are increasingly automated in modern broadcasting workflows.

170. Celfocus. (2024). Enabling Zero-Touch Automation of Network Operations. Celfocus News. <<https://www.celfocus.com/news/enabling-zero-touch-automation-of-network-operations>>

| Upskilling and Reskilling                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                      | Potential Career Pathways                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                                    | Additional Skills*                                                                                                                                                                                                                                                                                   | Possible Roles for Transition Within the Sector                                                                                                                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"><li>Image Development and Animation ●</li><li>Visual Collaterals Production ●</li><li>Prompt Engineering</li></ul>                                                                    | <ul style="list-style-type: none"><li>Budget Management</li><li>Resource Management</li><li>Production Planning and Scheduling</li><li>Procurement for Production Operations</li><li>Production Design</li><li>Production Operations</li><li>Visual Style Development</li><li>Set Design ●</li></ul> | <p><b>1. Creative &amp; Design: Production Artist/ Designer</b></p> <p>Creates motion-based digital content, such as animated advertisements, explainer videos, and in-app animations, for the purpose of enhancing user engagement and storytelling.</p>                                                                                                               |
| <ul style="list-style-type: none"><li>Digital Marketing</li></ul>                                                                                                                                                       | <ul style="list-style-type: none"><li>Advanced Technology Integration ●</li><li>Digital Marketing ●</li><li>E-Commerce Campaign Management ●</li><li>User Interface and User Experience (UI/UX) Optimisation ●</li><li>Website Performance Optimisation ●</li></ul>                                  | <p><b>Possible Roles for Transition into Other Sectors</b></p> <p><b>1. Wholesale and Retail Trade: Associate / Assistant, E-Commerce</b></p> <p>Assist in enhancing the online shopping experience through UI/UX improvements, technical platform support, data analysis, and digital marketing initiatives to drive performance and sustainability in e-commerce.</p> |
| <ul style="list-style-type: none"><li>Image Development and Animation ●</li><li>Photographic Images Manipulation ●</li><li>Visual Collaterals Production ●</li><li>Visual Design and Communication Principles</li></ul> | <ul style="list-style-type: none"><li>Digital Asset and File Management</li><li>Digital Image Production</li><li>Print Production Trends and Techniques</li><li>Typeface and Layout Production</li><li>Website Design ●</li><li>Data Storyboarding</li></ul>                                         | <p><b>2. Wholesale and Retail Trade: Graphic Designer</b></p> <p>Design and produce creative marketing and digital assets across print and online platforms, ensuring brand consistency while collaborating with marketing teams to deliver innovative, audience-focused promotional campaigns.</p>                                                                     |



AI / Digital Skills



Green Skills

\*Skills are non-exhaustive

# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#05

Creative & Design Copywriter

With the rise of AI automating content and language tasks, copywriters are pivoting towards strategic storytelling and brand voice development.

Job Purpose:

- The Copywriter is responsible for creating content for TV, radio, and digital platforms, producing scripts, advertisements, and promotional materials in alignment with creative guidelines and project requirements.

| AI                                                                                                                                                                                                                                                                                                                                                | DIGITAL SKILLS                                                                                                                                                                                                                                                                                 | GREEN SKILLS                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b><br/>AI tools like ChatGPT, Jasper, and Copy.ai generate and adapt marketing copy, reducing manual writing for standard formats.</p> <p><b>Low Human Intervention:</b><br/>Brand-specific prompts produce content that is almost ready for use, reducing the reliance for dedicated human involvement.</p> | <p><b>High Opportunity to Automate:</b><br/>Tools like Grammarly and CoSchedule automate editing, formatting, and content scheduling.</p> <p><b>Low Human Intervention:</b><br/>Templated or high-volume content can be generated with minimal human involvement through CMS integrations.</p> | <p><b>Low Environmental Impact on the Role:</b><br/>This role remains essential because the environmental requirements in the industry does not change the job functions at the moment.</p> <p><b>Low Opportunity to Diversify:</b><br/>There is limited opportunity for this role to diversify.</p> |



Case Study

Berita Harian - The Impact of AI on Content Production<sup>171</sup>

Intelligent AI tools integrated into Berita Harian’s Ringkasan Berita feature now automatically generate concise news summaries directly from full-length articles, reducing the need for junior copywriters to create content teasers, blurbs, or introductory paragraphs. The AI summary function takes over routine tasks such as drafting article introductions, short web summaries, and social media previews, traditionally performed by junior writers, reflecting a notable shift in content production workflows. Additionally, AI is increasingly being used to draft complete articles or repurpose press releases, with human involvement limited to final editing or approval by senior staff. This demonstrates how content creation processes are becoming more streamlined, with automation lessening dependence on dedicated copywriting roles.

171. <https://www.bharian.com.my/ringkasanberita/1452387>

| Upskilling and Reskilling                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                         | Potential Career Pathways                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                                                                                                        | Additional Skills*                                                                                                                                                                                                                                      | Possible Roles for Transition Within the Sector                                                                                                                                                                                                                                            |
| <ul style="list-style-type: none"><li>Broadcast and Interactive Media Copywriting</li><li>Platform Knowledge and Deployment ●</li><li>Concept Creation</li><li>Creative Execution</li><li>Creative Storytelling</li><li>Ethics, Values and Legislation</li><li>Prompt Engineering</li></ul> | <ul style="list-style-type: none"><li>Brand Campaign Management</li><li>Marketing Campaign Management</li><li>Media Strategy Development</li><li>Visual Design and Communication Principles</li></ul>                                                   | <p><b>1. Sponsorships &amp; Brand Integration: Promo Producer</b><br/>Creates brand-aligned short-form promos by scripting, directing visuals, and ensuring timely delivery across platforms.</p>                                                                                          |
| <ul style="list-style-type: none"><li>Broadcast and Interactive Media Copywriting</li><li>Communications Channel Management</li><li>Media Platforms Management</li><li>Platform Knowledge and Deployment ●</li><li>Prompt Engineering</li></ul>                                             | <ul style="list-style-type: none"><li>Brand Campaign Management</li><li>Digital Marketing</li><li>Marketing Campaign Management</li><li>Media Strategy Development</li><li>Customer Behaviour Analysis</li><li>Client Relationship Management</li></ul> | <p><b>2. Sponsorships &amp; Brand Integration: Marketing Executive</b><br/>Supports and executes marketing campaigns, tracks performance, and manages marketing materials to ensure consistent brand delivery and effective audience engagement.</p>                                       |
| <ul style="list-style-type: none"><li>Communications Channel Management</li><li>Research and Information Synthesis</li></ul>                                                                                                                                                                | <ul style="list-style-type: none"><li>Brand Campaign Management</li><li>Brand Guideline Development</li><li>Digital Marketing</li><li>Social Media Marketing</li></ul>                                                                                  | Possible Roles for Transition into Other Sectors                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                         | <p><b>1. Wholesale and Retail Trade: Associate/ Assistant, Brand</b><br/>Assist in executing brand plans and campaigns, analyse market and consumer data, develop promotional materials, and support initiatives to enhance brand awareness, customer loyalty, and product visibility.</p> |



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#06

Post-production & Editing Video/Visual Editor

The growing prevalence of automation is increasingly impacting the role of the Video/Visual Editor, reducing the need for traditional post-production work.

**Job Purpose:**

- The role of a Video/Visual Editor is to edit and refine video content by applying creative direction, visual effects, and technical adjustments to deliver cohesive, high-quality outputs for television and digital platforms.

| AI                                                                                                                                                                                                                     | DIGITAL SKILLS                                                                                                                                                                              | GREEN SKILLS                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools such as Runway ML, Pictory, Wisecut, and Premiere Pro are automating editing tasks including sequencing, colour grading, syncing, and subtitle generation.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Digital platforms like DaVinci Resolve and Frame.io automate formatting, file handling, and collaborative review across post-production.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential because the environmental requirements in the industry does not change the job functions at the moment.</p> |
| <p><b>Low Human Intervention:</b></p> <p>AI edits raw footage with minimal human input using templates, scene detection, and transcription with light touch-ups.</p>                                                   | <p><b>Low Human Intervention:</b></p> <p>Editors work with templates, auto-backups, and simplified approval processes, requiring minimal manual coordination.</p>                           | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                                                    |

### Case Study

#### Runway ML and the Automation of Video Editing in Broadcasting<sup>172</sup>

AI-powered video platforms such as Runway ML are now automating tasks like scene detection, background replacement, motion tracking, and subtitle generation, all of which were traditionally handled by Video/Visual Editors. According to Runway’s CEO Cristóbal Valenzuela, the platform allows broadcast teams to produce content using natural language prompts, speeding up workflows and reducing manual effort. For example, in the United States, CBS’s Late Show team used Runway to complete advanced video composites in a single day, a process that previously required several days, illustrating how AI is transforming editing workflows and reducing the demand for traditional editor roles.

172. Sarah Guo, No Priors, Episode 102: Cris Valenzuela, Founder/CEO RunwayML, 9 February 2023, <<https://sarahguo.com/blog/crisvalenzuela>>; Runway, How Runway took The Late Show edits from five hours to five minutes, <<https://runwayml.com/customers/how-late-night-show-cbs-uses-runway>>

| Upskilling and Reskilling                                                                                                                                                                                                                                                                                | Potential Career Pathways                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>Transferable Skills*</div> <ul style="list-style-type: none"><li>Video Editing ●</li><li>Technical Video Editing ●</li><li>Sound Editing ●</li><li>Sound Mixing ●</li><li>Colour Grading ●</li><li>Prompt Engineering ●</li></ul>                                                                   | <div>Additional Skills*</div> <ul style="list-style-type: none"><li>Project Management ●</li><li>Platform Knowledge and Deployment ●</li><li>Media File Formats Conformation ●</li><li>Media Platforms Management ●</li><li>Regulatory Compliance ●</li></ul> |
| <div>Possible Roles for Transition Within the Sector</div> <div>1. <b>Post-production &amp; Editing: Post-Production Supervisor/ Assistant</b></div> <p>Oversees post-production by managing workflows, coordinating teams, and ensuring outputs meet creative, technical, and regulatory standards.</p> | <div>Possible Roles for Transition into Other Sectors</div> <div>1. <b>Information and Communication: Game Video Editor/ Game Trailer Editor</b></div> <p>Edits game trailers and cutscenes for marketing and storytelling.</p>                               |

# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#07

Post-production & Editing Subtitler

The rapid rise of AI is increasingly impacting the role of the Subtitler, as AI now handles timing and language accuracy with growing precision, reducing the need for human intervention.

Job Purpose:

- The role of a Subtitler involves creating and synchronising subtitles or captions, whether in the same language or translated, to provide accurate, accessible, and precisely timed text representations of dialogue and sound in audiovisual content.

| AI                                                                                                                                                                                                             | DIGITAL SKILLS                                                                                                                                                                                                                                                                   | GREEN SKILLS                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools like Whisper, Papercup, and Trint automate transcription, subtitle generation, voice syncing, and styling, thus minimising manual subtitling work.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools like Aegisub, Subtitle Edit, and Trados Studio assist with formatting and translation memory, reducing manual effort and enhancing productivity.</p>                                                                | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential because the environmental requirements in the industry does not change the job functions at the moment.</p> |
| <p><b>Low Human Intervention:</b></p> <p>As AI advances in understanding language nuances and context, subtitling for general content is becoming largely automated.</p>                                       | <p><b>Low Human Intervention:</b></p> <p>Digital subtitling tools streamline the process, efficiently managing formatting, syncing, and translation. This significantly reduces the need for manual input, with human involvement primarily focused on final quality checks.</p> | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                                                    |



Case Study

Sky News–Papercup: Automating Subtitling and Dubbing<sup>173</sup>

Global broadcasters like Sky News have collaborated with Papercup to automatically translate and dub English-language news into Spanish. Within a year, this AI-powered subtitling and dubbing achieved 26 million views and attracted 96,000 new subscribers, expanding multilingual reach while reducing the need for manual translation and timing. As AI continues to enhance subtitle timing and language accuracy, subtitling work is moving away from manual transcription toward post-editing and quality control.

173. Kyle Wiggers, Papercup raises \$10.5 million to dub videos with AI-generated speech, Venture Beat, 10 December 2020, <[https://venturebeat.com/ai/papercup-raises-10-5-million-to-dub-videos-with-ai-generated-speech?utm\\_source=](https://venturebeat.com/ai/papercup-raises-10-5-million-to-dub-videos-with-ai-generated-speech?utm_source=)

| Upskilling and Reskilling                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                           | Potential Career Pathways                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                                                                                                                        | Additional Skills*                                                                                                                                                                                                        | Possible Roles for Transition Within the Sector                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"><li>Video Editing ●</li><li>Technical Video Editing ●</li><li>Sound Editing ●</li><li>Sound Mixing ●</li><li>Colour Grading ●</li><li>Prompt Engineering</li></ul>                                                                                                        | <ul style="list-style-type: none"><li>Project Management</li><li>Platform Knowledge and Deployment ●</li><li>Media File Formats Conformation ●</li><li>Media Platforms Management</li><li>Regulatory Compliance</li></ul> | <p><b>1. Post-production &amp; Editing: Compliance Editor</b></p> <p>Ensures media content complies with broadcasting regulations, licensing conditions, advertising standards, and ethical guidelines.</p>                                                                                                    |
| <ul style="list-style-type: none"><li>Content Writing and Editing</li><li>Broadcast and Interactive Media Copywriting</li><li>Rules-Based Copy Editing</li><li>Cultural Awareness and Sensitivity</li><li>Regulatory Compliance</li><li>Ethics, Values and Legislation</li><li>Prompt Engineering</li></ul> | <ul style="list-style-type: none"><li>Communications Channel Management</li><li>Research and Information Synthesis</li><li>Ethical Reporting</li></ul>                                                                    | <p><b>2. Post-production &amp; Editing: Editor</b></p> <p>Oversees the editing and refinement of video, audio, and multimedia content to ensure accurate, cohesive, and platform-ready outputs across TV, radio, and digital channels, while maintaining editorial quality, tone, and compliance standards</p> |

AI / Digital Skills

Green Skills

\*Skills are non-exhaustive



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#08

Sponsorship & Brand Integration Social Media Executive

The rise of AI and digital tools is shifting Social Media Executive roles toward strategic planning and creative data analysis.

Job Purpose:

- The role of a Social Media Executive is to manage daily social media activities by coordinating with teams, driving audience engagement, monitoring performance metrics, and ensuring the timely delivery of brand and programme promotions.

| AI                                                                                                                                                                                                                             | DIGITAL SKILLS                                                                                                                                                       | GREEN SKILLS                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools such as ChatGPT, Jasper, and TopicPulse are streamlining content creation, audience targeting, performance tracking, and campaign optimisation through automation.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Tools like Hootsuite and Buffer automate scheduling, generate audience insights, and produce performance reports.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential because the environmental requirements in the industry does not change the job functions at the moment.</p> |
| <p><b>Low Human Intervention:</b></p> <p>AI now manages content creation, audience engagement, and performance reporting with minimal human input, leaving humans primarily responsible for strategy and final approvals.</p>  | <p><b>Low Human Intervention:</b></p> <p>Most tasks are now automated, requiring only minimal input beyond strategy and final approvals.</p>                         | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                                                    |



| Upskilling and Reskilling                                                                                                                                                                                                                                                                                               | Potential Career Pathways                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>Transferable Skills*</div> <ul style="list-style-type: none"><li>• Brand Campaign Management</li><li>• Marketing Campaign Management</li><li>• Media Platforms Management</li><li>• Platform Knowledge and Deployment ●</li><li>• Visual Design and Communication Principles</li><li>• Digital Marketing</li></ul> | <div>Additional Skills*</div> <ul style="list-style-type: none"><li>• Broadcast and Interactive Media Copywriting</li><li>• Media Strategy Development</li><li>• Concept Creation</li><li>• Creative Execution</li><li>• Creative Storytelling</li></ul> |
| <div>Possible Roles for Transition Within the Sector</div> <div>1. Sponsorships &amp; Brand Integration: Promo Producer</div> <p>Leads promo production by developing brand-aligned concepts, scripting, and overseeing visual execution for timely, high-impact delivery.</p>                                          | <div>2. Sponsorships &amp; Brand Integration: Marketing Executive</div> <p>Supports marketing campaigns, monitors performance, and manages materials to ensure brand consistency and audience engagement.</p>                                            |

● AI / Digital Skills ● Green Skills \*Skills are non-exhaustive

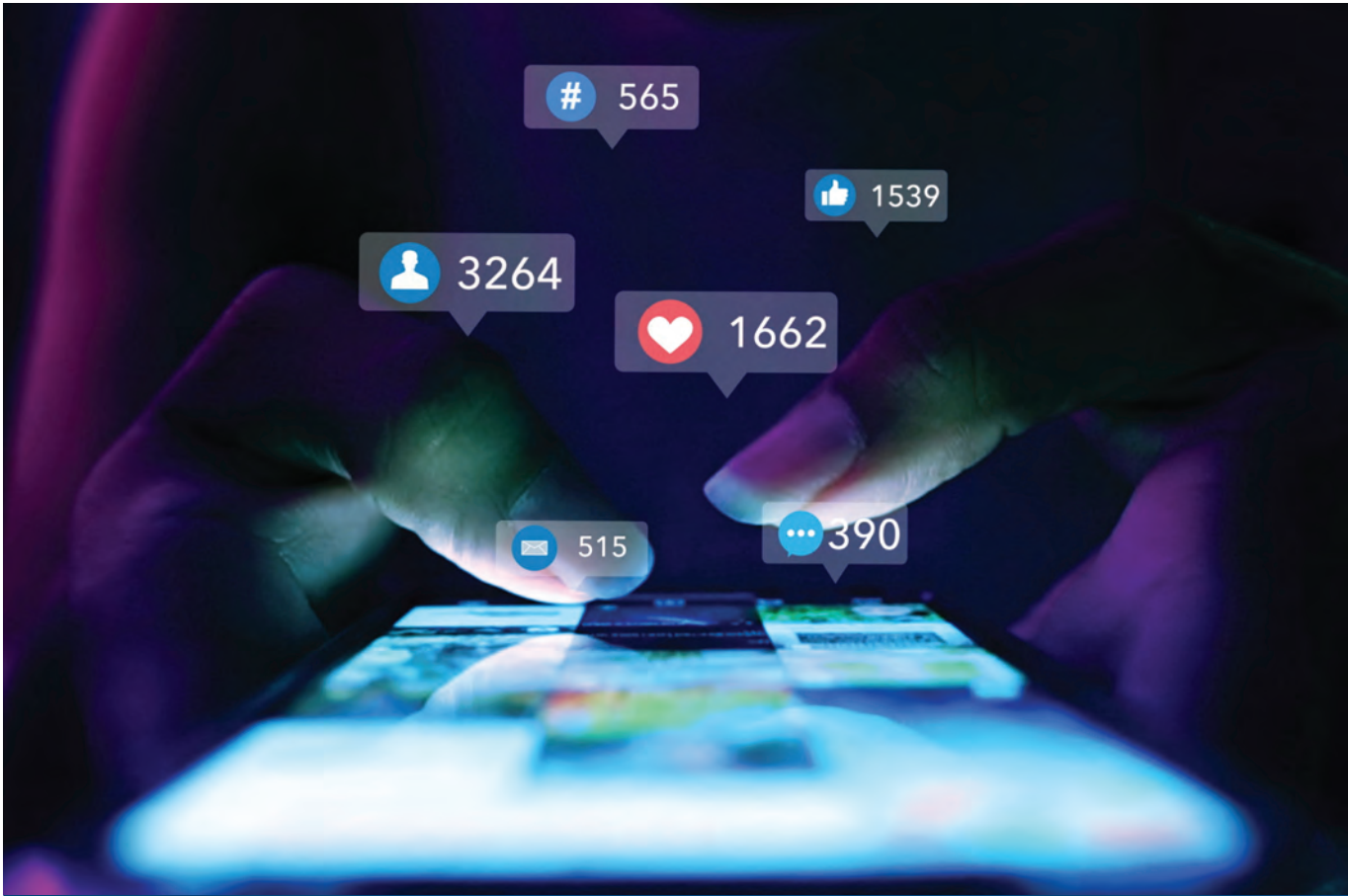
# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#08

Sponsorship & Brand Integration Social Media Executive (Continued)



### Case Study

#### Dick Broadcasting - AI Automation Redefines Social Media Executive Roles<sup>174</sup>

Dick Broadcasting, a United States-based radio and digital broadcaster, partnered with TopicPulse® Instant Video, an AI-powered video automation tool, to maintain a consistent posting schedule on TikTok during holiday periods when staff were unavailable. The platform automatically identified trending topics, generated branded short-form clips, and posted them across platforms without requiring additional staff.

This resulted in 100% posting consistency with no content blackouts, rapid viral engagement, and follower growth within 48 hours, showcasing how routine social media tasks can be fully automated and significantly reduce the day-to-day workload of Social Media Executives. Despite the lack of active staff involvement, Dick Broadcasting still achieved audience growth and sustained engagement, proving that AI can now take over key functions traditionally managed by social media teams.

174. Futuri, Case Study: Dick Broadcasting Solves Holiday Blackout with a TikTok Breakthrough and 24/7 On Brand Posting, <[https://futurimedia.com/case-studies/ai-social-media-automation-dick-broadcasting-tiktok-case-study/?utm\\_source=](https://futurimedia.com/case-studies/ai-social-media-automation-dick-broadcasting-tiktok-case-study/?utm_source=)

| Upskilling and Reskilling                                                                                                                  |                                                                                                                                                                                                                                                                                   | Potential Career Pathways                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                       | Additional Skills*                                                                                                                                                                                                                                                                | Possible Roles for Transition into Other Sectors                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"><li>Digital Marketing</li><li>Social Media Management</li><li>Search Engine Optimisation (SEO)</li></ul> | <ul style="list-style-type: none"><li>Big Data Analytics ●</li><li>Content Management</li><li>Inbound Marketing</li><li>Paid Search Engine Marketing (SEM)</li><li>Research and Information Synthesis</li><li>User Interface and User Experience (UI/UX) Optimisation ●</li></ul> | <p><b>1. Wholesale and Retail Trade: Executive, Retail Digital Marketing</b></p> <p>Design and execute digital marketing campaigns, manage website and social media content, analyse performance data, and implement strategies to boost customer engagement, brand presence, and online sales.</p>                                 |
| <ul style="list-style-type: none"><li>Digital Marketing</li><li>Social Media Management</li><li>Search Engine Optimisation (SEO)</li></ul> | <ul style="list-style-type: none"><li>Big Data Analytics ●</li><li>Inbound Marketing</li><li>Content Management</li><li>Paid Search Engine Marketing (SEM)</li><li>Social Media Marketing</li><li>Sustainable Business Practices ●</li></ul>                                      | <p><b>2. Wholesale and Retail Trade: Specialist, Search &amp; Social Media</b></p> <p>Develop and manage social media marketing strategies and campaigns across platforms, collaborate on engaging content, track and analyse performance metrics, and apply industry insights to enhance brand visibility and competitiveness.</p> |

● AI / Digital Skills ● Green Skills \*Skills are non-exhaustive



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#09

Media Sales & Client Management: Traffic Scheduling Executive

As AI and digital tools continue to advance, Traffic Scheduling roles are shifting toward sales coordination and broader operational support.

**Job Purpose:**

- The role of a Traffic Scheduling Executive executes commercial bookings, manages materials and compliance, reconciles logs, ensures audit-ready records, and coordinates with teams to support campaign delivery and broadcast operations.

| AI                                                                                                                                                                                                | DIGITAL SKILLS                                                                                                                                                                                  | GREEN SKILLS                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI tools such as Salesforce Einstein and RPA bots now automate tasks like material assignment, compliance verification, and report generation.</p> | <p><b>High Opportunity to Automate:</b></p> <p>Traffic and billing systems such as WideOrbit, vCreative, and RCS Zetta streamline bookings, material tracking, and log reconciliation.</p>      | <p><b>Low Environmental Impact on the Role:</b></p> <p>This role remains essential because the environmental requirements in the industry does not change the job functions at the moment.</p> |
| <p><b>Low Human Intervention:</b></p> <p>AI now manages repetitive scheduling, error detection, and reconciliation with minimal human input.</p>                                                  | <p><b>Low Human Intervention:</b></p> <p>Most scheduling and tracking processes now require minimal supervision, enabling staff to concentrate on handling exceptions and resolving issues.</p> | <p><b>Low Opportunity to Diversify:</b></p> <p>There is limited opportunity for this role to diversify.</p>                                                                                    |



### Case Study

#### Alpha Media – Automating Traffic Scheduling with vPPO<sup>175</sup>

Alpha Media implemented the Virtual Paperless Production Order (vPPO) platform, a service provided by vCreative, to streamline advertising operations across its radio stations. The system automates the management of commercial materials, approvals, and production timelines, tasks traditionally handled manually by traffic and scheduling staff. By integrating vPPO into its broadcast workflow, Alpha Media reduced processing errors, improved compliance documentation accuracy, and accelerated ad campaign turnaround times.

This case reflects a broader industry shift toward automating traffic scheduling functions, particularly in verifying ad readiness, coordinating with agencies, and generating reports, which are core responsibilities of a Traffic Scheduling Executive in broadcasting.

175. Radio and Production, Alpha Media Signs Long-Term Deal with vCreative's vPPO and adds vTrade Across All Stations, 25 February 2021, <<https://rapmag.com/a/21/feb21/alpha-media-signs-with-vcreative-s-vppo>>

| Upskilling and Reskilling                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                     | Potential Career Pathways                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transferable Skills*                                                                                                                                                                                                                                                                                   | Additional Skills*                                                                                                                                                                                                                                  | Possible Roles for Transition Within the Sector                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>Brand Campaign Management</li><li>Marketing Campaign Management</li><li>Media Platforms Management</li><li>Platform Knowledge and Deployment ●</li><li>Visual Design and Communication Principles</li><li>Digital Marketing</li><li>Prompt Engineering</li></ul> | <ul style="list-style-type: none"><li>Broadcast and Interactive Media Copywriting</li><li>Media Strategy Development</li><li>Communication Channel Management</li><li>Creative Execution</li><li>Ethics, Values and Legislation</li></ul>           | <p><b>1. Media Sales &amp; Client Management: Sales Executive</b></p> <p>Drives sales revenue by managing client relationships, identifying opportunities, and executing sales strategies aligned with broadcasting and digital platforms.</p>                                                   |
| <ul style="list-style-type: none"><li>Production Planning and Scheduling</li><li>Compliance Reporting</li><li>Data Management ●</li><li>Prompt Engineering</li></ul>                                                                                                                                   | <ul style="list-style-type: none"><li>Logistic Management</li><li>Equipment Operation</li><li>Inventory Management</li><li>Resource Management</li><li>Workplace Safety and Health</li><li>Production Operations</li></ul>                          | <p><b>2. Content Production &amp; Programming: Production Assistant</b></p> <p>Provides logistical, administrative, and on-ground support to ensure smooth daily operations of broadcast and digital content production, from set readiness to crew coordination and documentation handling.</p> |
| <ul style="list-style-type: none"><li>Data Management ●</li><li>Compliance Reporting</li><li>Regulatory Compliance</li><li>Production Planning and Scheduling</li><li>Dashboard Creation and Visualisation</li><li>Platform Knowledge and Deployment ●</li></ul>                                       | <ul style="list-style-type: none"><li>Attention to Detail</li><li>Media Law and Compliance</li><li>Knowledge of Legal and Compliance</li><li>Media Content Cataloguing</li><li>Troubleshooting</li><li>System Monitoring and Diagnostic ●</li></ul> | <p><b>3. Broadcast Support Services: Transmission Log Coordinator</b></p> <p>Responsible for managing and overseeing the scheduling, tracking, and accurate recording of broadcast programming, ensuring all content is aired according to schedule and complies with regulatory standards.</p>  |

● AI / Digital Skills ● Green Skills \*Skills are non-exhaustive



Summary of High Impact Roles

|                                                                                                                                                                                             |                                                                                                                      |                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Content Production &amp; Programming</b> <ul style="list-style-type: none"><li>• Program Researcher</li><li>• Junior Scriptwriter / Junior Writer</li><li>• Assistant Director</li></ul> | <b>Creative &amp; Design</b> <ul style="list-style-type: none"><li>• Graphic Designer</li><li>• Copywriter</li></ul> | <b>Post-Production &amp; Editing</b> <ul style="list-style-type: none"><li>• Video / Visual Editor</li><li>• Subtitler</li></ul> |
| <b>Sponsorship &amp; Brand Integration</b> <ul style="list-style-type: none"><li>• Social Media Executive</li></ul>                                                                         | <b>Ad Operations &amp; Scheduling</b> <ul style="list-style-type: none"><li>• Traffic Scheduling Executive</li></ul> |                                                                                                                                  |

Medium and Low Impacted Roles Analysis

Medium Impacted Roles

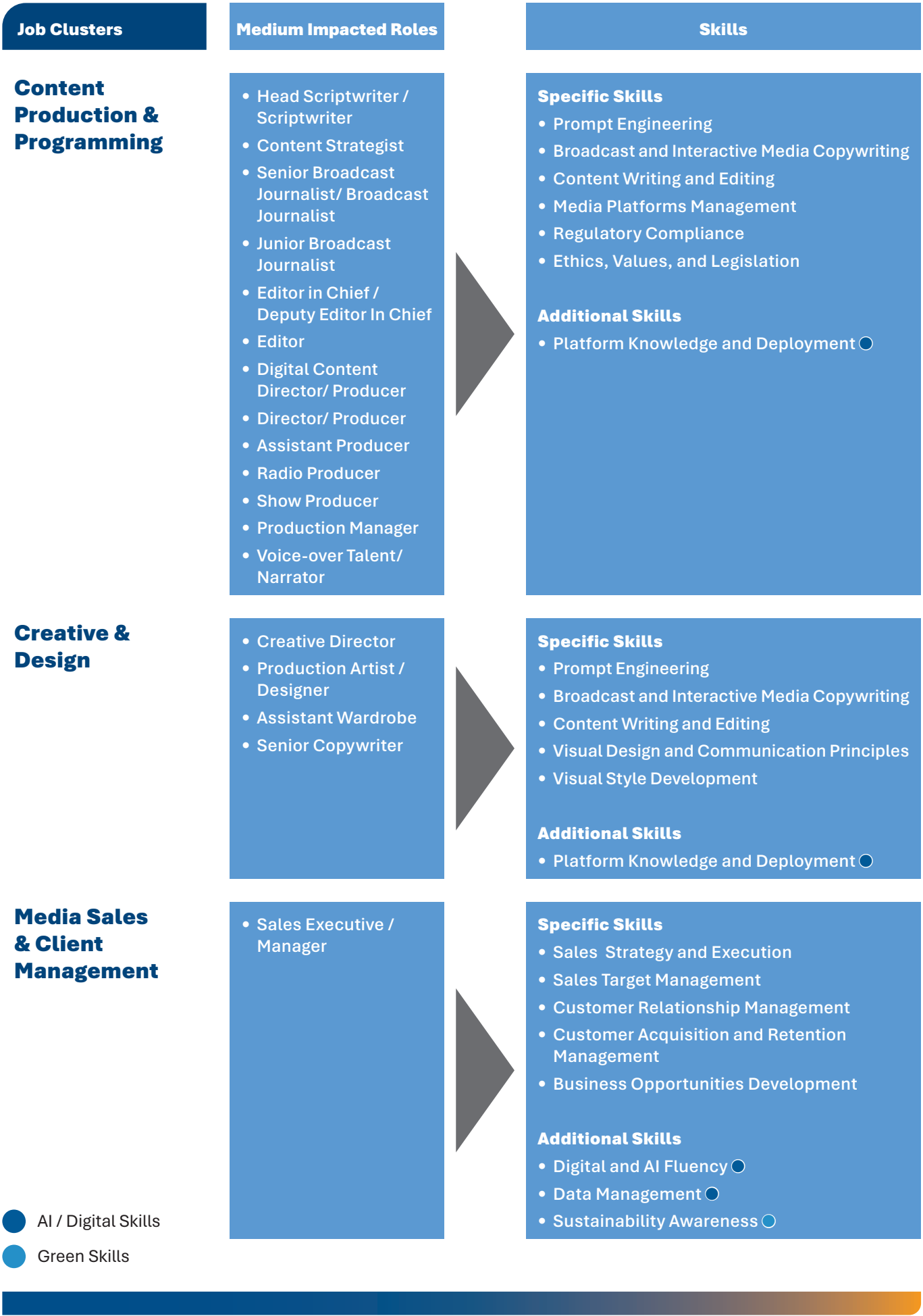
The findings of the study show that 53% of medium-impact roles in the Broadcasting sector are primarily operational, requiring upskilling to adapt to evolving technologies and sustainability trends.

On-Demand Skills Analysis for 36 Medium Impacted Roles

| Job Clusters                          | Medium Impacted Roles                                                                                                                                                                                                                 | Skills                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ad Operations &amp; Scheduling</b> | <ul style="list-style-type: none"><li>• Head / Manager – Ad Operations &amp; Scheduling</li></ul>                                                                                                                                     | <b>Specific Skills</b> <ul style="list-style-type: none"><li>• Brand Campaign Management</li><li>• People and Performance Management</li><li>• Marketing Campaign Management</li><li>• Media Platforms Management</li><li>• Revenue Optimisation</li></ul> <b>Additional Skills</b> <ul style="list-style-type: none"><li>• Data Visualisation</li><li>• Platform Knowledge and Deployment</li><li>• Data Management</li></ul> |
| <b>Broadcast Support Services</b>     | <ul style="list-style-type: none"><li>• Head of Radio Operations/ Head of Television Operations, Broadcasting</li><li>• Media Asset Management (MAM) Manager</li><li>• Web Developer</li><li>• Transmission Log Coordinator</li></ul> | <b>Specific Skills</b> <ul style="list-style-type: none"><li>• Dashboard Creation and Visualisation</li></ul> <b>Additional Skills</b> <ul style="list-style-type: none"><li>• Digital and AI Fluency</li><li>• Platform Knowledge and Deployment</li><li>• Data Management</li><li>• Data Privacy and Security</li></ul>                                                                                                      |

- AI / Digital Skills
- Green Skills







| Job Clusters                        | Medium Impacted Roles                                                                                     | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technical Crew                      | <ul style="list-style-type: none"><li>Camera Operator</li><li>Camera Control Unit Operator</li></ul>      | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Equipment Operation</li><li>Workplace Safety and Health</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Multi-Camera Operations</li><li>Technical Camera Operations</li></ul></div>                                                                                                                                                                  |
| Technical Operations & Transmission | <ul style="list-style-type: none"><li>Incident Manager</li><li>Supervisor (Master Control Room)</li></ul> | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Asset Preventive Maintenance Management</li><li>Audit and Compliance Strategy Development</li><li>Equipment Maintenance</li><li>Workplace Safety and Incident management</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Automation Process Control</li><li>Automation System Maintenance</li><li>Network and Systems Administration</li></ul></div> |

- AI / Digital Skills
- Green Skills

Example: Illustration of Medium Impacted Roles

Medium impacted Role #01 Content Production & Programming: Radio Producer

The study demonstrates that the medium-impacted roles identified require continuous upskilling to stay relevant and adapt to the evolving sector as AI and digital adoption accelerate.

| Roles                                                                                                                                                                                                                                                                                                                              | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Radio Producer</b> <div><b>Job Purpose:</b><ul style="list-style-type: none"><li>Responsible for planning, organising, and producing live or recorded radio programmes, coordinating all aspects from scripting to sound and music selection, with the overarching aim of ensuring the programme runs smoothly.</li></ul></div> | <div><b>AI / Digital Skills</b><div><b>1. Digital and AI Fluency</b><p>Proficiency in using digital tools and AI systems to create, manage, and personalise audio content, streamline production workflows, and engage target audiences across multi-platform broadcasting.</p></div></div> <div><b>Green Skills</b><div><b>1. Sustainability Awareness</b><p>Understanding of environmentally responsible practices in content creation and broadcasting, including energy-efficient production, digital resource management, and promoting green messaging through media.</p></div></div> |



Case Study

AI Announcer Transforms Radio Production<sup>176</sup>

AI is transforming the way radio programmes are created and delivered. At Radio Mustang Jakarta, the team launched “Aimee,” an AI radio announcer capable of reading scripts, interacting with listeners, and managing broadcast schedules on its own. Powered by advanced voice synthesis, Aimee hosts shows around the clock with pre-set emotional tones and real-time responses. Instead of presenting live, radio producers now focus on crafting content, writing AI-optimised scripts, and overseeing the overall broadcast flow. By automating routine tasks such as script reading and scheduling, AI enables producers to dedicate more time to creative direction, audience engagement, and content strategy, while also reducing staffing needs during late-night or off-peak slots.

176. Harliantara et al., Radio Broadcasting with Artificial Intelligence: A Case Study on Radio Mustang Jakarta, Communicatus: Jurnal Ilmu Komunikasi, 8(1), 121–138, 2024, <<https://journal.uinsgd.ac.id/index.php/cjik/article/view/34403>>



Medium impacted Role

#02

Creative & Design: Senior Copywriter

| Roles                                                                                                                                                                                                                                                                                                                                                                        | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Senior Copywriter</b><br><br><b>Job Purpose:</b> <ul style="list-style-type: none"><li>Responsible for leading content creation across TV, radio, and digital platforms, ensuring all written material aligns with the brand’s voice, artistic direction, and strategic objectives, while researching client and industry trends and overseeing junior writers.</li></ul> | <b>AI / Digital Skills</b> <ol style="list-style-type: none"><li><b>Digital and AI Fluency</b><br/>Proficient in using digital and AI tools to generate, refine, and adapt creative content across platforms while maintaining brand voice, message consistency, and campaign effectiveness.</li><li><b>Platform Knowledge and Deployment</b><br/>Ability to manage and optimise written content across multiple broadcast and digital platforms, ensuring timely delivery, appropriate formatting, and maximum audience reach.</li></ol><br><b>Green Skills</b> <ol style="list-style-type: none"><li><b>Sustainability Awareness</b><br/>Ability to integrate eco-conscious messaging into campaigns while applying sustainable practices in content production and digital media management.</li></ol> |



Case Study

Transforming Creative Content Development with AI

AI is transforming the way creative teams produce content across platforms. A 2024 case study highlighted how a corporate team integrated ChatGPT into their digital content workflow. The AI generated first drafts for blog posts and social media captions, suggested tone variations, and provided headline ideas. Senior copywriters no longer had to build from the ground up. Instead, they focused on refining AI drafts, ensuring messaging aligned with the brand voice, and mentoring junior writers on turning AI-generated content into high-impact campaigns. With AI handling the groundwork, senior writers could concentrate on strategy, creativity, and maintaining quality across TV, radio, and digital channels, resulting in faster turnarounds and stronger brand consistency.<sup>177</sup>

177. Aleksandar P. Kavgić, Learning to Work with AI in Digital Media Copywriting (DMC): A Case Study On Introducing ChatGPT To Corporate Content Creation, Philologia Mediana, 2024, <<https://www.philologiamediana.com/index.php/phm/article/view/978/824>>



Low Impacted Roles

The study identified that 23 roles, representing 34% of positions within the Broadcasting sector, are low-impact, reflecting work that remains highly dependent on human expertise. These roles require substantial manual intervention, on-site presence, and real-time judgment, with AI and digital tools serving mainly as supportive aids rather than direct replacements.

Across both creative and technical functions, many tasks call for physical handling, visual assessment, and live coordination with other crew members. Production, studio operations, and makeup teams, for example, manage equipment setup, adjust lighting on set, apply makeup suited to different lighting conditions, and synchronise timing and movement across departments. Such responsibilities demand hands-on skill, attention to visual detail, and responsive teamwork.

Technical roles including engineering, audio mixing, and transmission likewise rely on human expertise to monitor live feeds, troubleshoot signals, and keep on-air operations running smoothly. Although digital systems assist with data analysis and automation, people are still needed to interpret information and respond quickly to unpredictable situations, particularly during live broadcasts or outdoor shoots.

Other functions such as Outside Broadcast (OB) vehicle driving, compliance editing, and legal licensing remain firmly human-led because of their sensitivity, accountability, and mobility requirements. For instance, OB drivers are tasked not only with transporting the vehicle but also with supporting Technical Producers in assessing site conditions and preparing remote setups. Their duties include evaluating location safety, assisting with on-site installation, and ensuring that the OB vehicle is parked in a safe and suitable area, among other responsibilities.



These tasks cannot be entrusted to automation because human presence is required to drive, evaluate safety, and oversee on-site preparation. Similarly, content compliance requires human oversight to ensure that every broadcast aligns with national regulations, intellectual property laws, and ethical broadcasting standards. This includes assessing language use, visual content, and audience suitability, where context and judgment remain irreplaceable. These reviews still depend heavily on experienced editors who can interpret not just policy but intent and tone.

These findings point to a segment of broadcasting work where AI and digital technologies complement rather than replace human effort. In many of these positions, both technology use and human intervention are high, working together to meet operational, regulatory, and creative demands. As the chapter explores, these low-impact roles illustrate how skilled professionals continue to provide the judgment, presence, and accountability that AI cannot fully replicate.

On-Demand Skills Analysis for 23 Low Impacted Roles

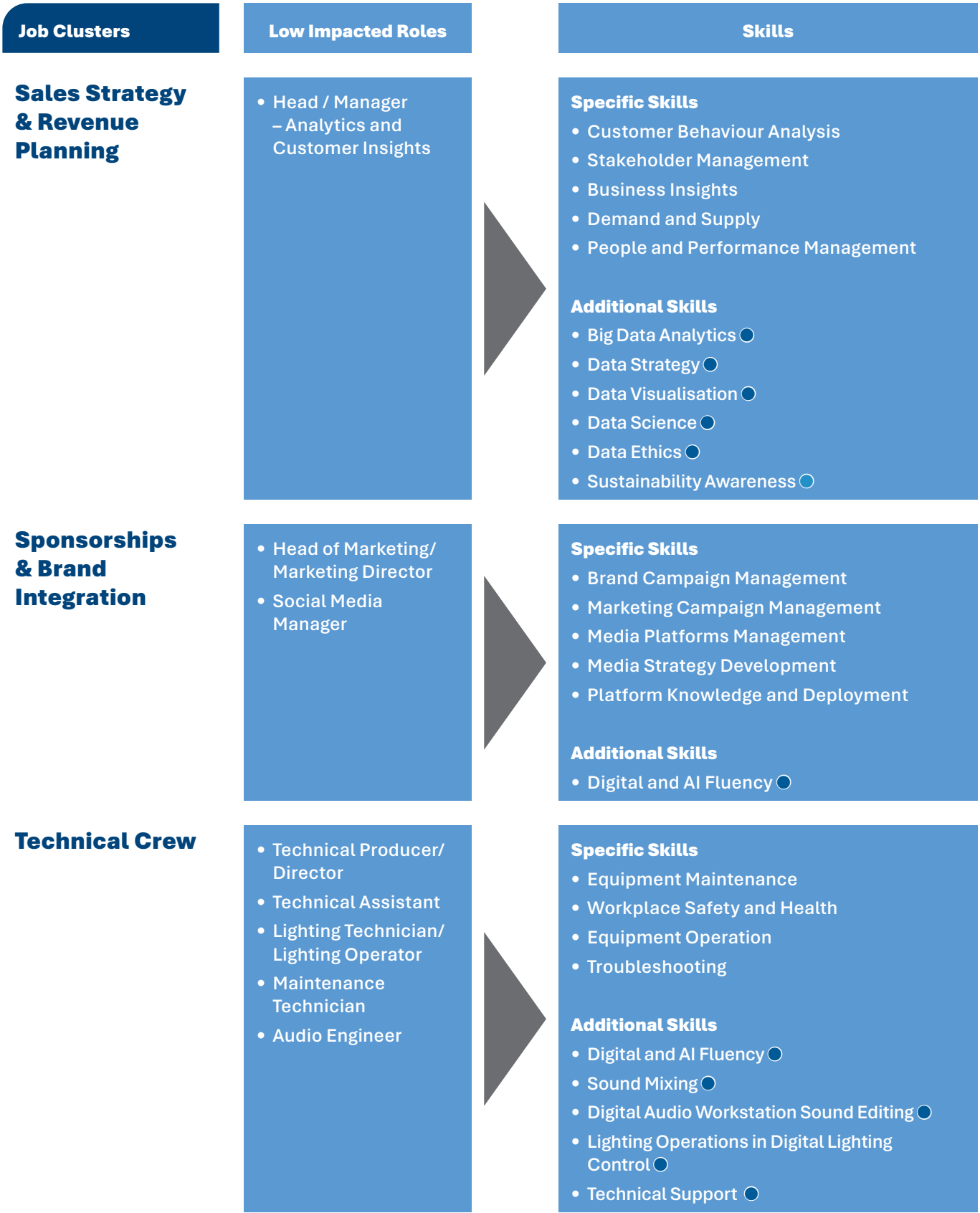
| Job Clusters               | Low Impacted Roles                                                                                                                                     | Skills                                                                                                                                                                                                                                                                                             |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Broadcast Support Services | <ul style="list-style-type: none"><li>Legal Affairs Executive</li><li>Rights and Licensing Manager</li><li>Outside Broadcast Facility Driver</li></ul> | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Compliance Reporting</li><li>Regulatory Compliance</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Digital and AI Fluency</li><li>Data Ethics</li><li>Sustainability Awareness</li></ul></div> |

- AI / Digital Skills
- Green Skills

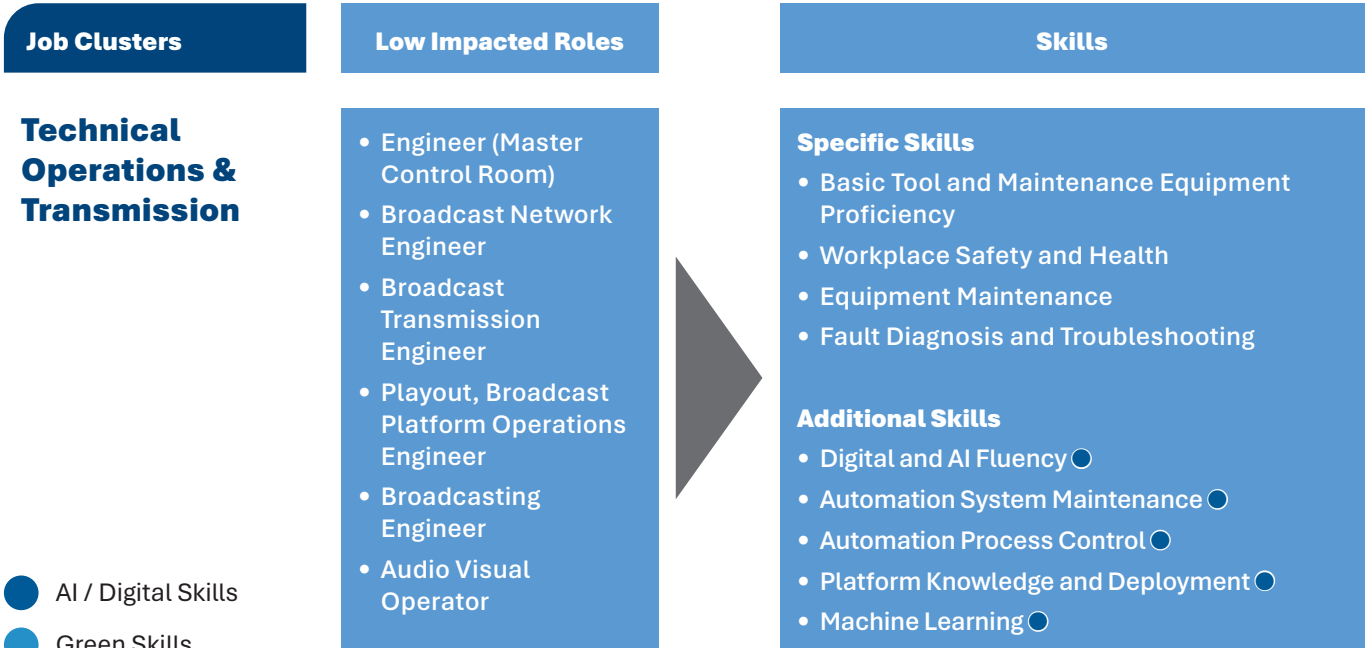
| Job Clusters                     | Low Impacted Roles                                                                                                | Skills                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Content Production & Programming | <ul style="list-style-type: none"><li>Music Director</li><li>Production Assistant</li><li>Floor Manager</li></ul> | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Production Planning and Scheduling</li><li>Vendor Management</li><li>Workplace Safety and Health</li><li>Production Operations</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Digital and AI Fluency</li></ul></div>                                                              |
| Creative & Design                | <ul style="list-style-type: none"><li>Beautician / Make – Up Artist</li></ul>                                     | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Stakeholder Management</li><li>Makeup Application</li><li>Makeup Image Design</li><li>Hair Cutting and Styling</li><li>Sanitation and Skin Hygiene Practices</li></ul></div>                                                                                                                                          |
| Media Sales & Client Management  | <ul style="list-style-type: none"><li>Head of Sales/ Sales Director</li></ul>                                     | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Sales Strategy and Execution</li><li>Sales Target Management</li><li>Customer Acquisition and Retention Management</li><li>Stakeholder Management</li><li>People and Performance Management</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Digital and AI Fluency</li></ul></div> |
| Post-Production & Editing        | <ul style="list-style-type: none"><li>Compliance Editor</li></ul>                                                 | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Content Writing and Editing</li><li>Rules-Based Copy Editing</li><li>Regulatory Compliance</li><li>Media Law and Compliance</li><li>Ethical Reporting</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Digital and AI Fluency</li></ul></div>                                       |

- AI / Digital Skills
- Green Skills





- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills

Example: Illustration of Low Impacted Roles

The study identified that low-impact roles in the Broadcasting sector require physical presence, complex problem-solving, and emotional intelligence that current technology cannot fully replicate.

Low impacted Role #01 Sponsorships & Brand Integration: Head of Marketing / Marketing Director

| Roles                                                                                                                                                                                                                  | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Head of Marketing / Marketing Director</b>                                                                                                                                                                          | <b>AI / Digital Skills</b> <div><b>1. Digital and AI Fluency</b><div>Skilled in utilising digital and AI tools to analyse audience insights, enhance campaign performance, and inform strategic decisions across multi-platform marketing initiatives.</div></div> <div><b>2. Platform Knowledge and Deployment</b><div>Proficient in overseeing and refining marketing content across digital and traditional channels to maximise reach, ensure timely execution, and support strategic goals.</div></div> |
| <b>Job Purpose:</b> <div>Oversees the organisation’s marketing strategy to strengthen brand presence, boost audience engagement, and maximise campaign performance across both digital and traditional channels.</div> | <b>Green Skills</b> <div><b>1. Sustainability Awareness</b><div>Ability to understand how to integrate eco-conscious practices into marketing strategies, campaigns, and media selections while supporting the organisation’s broader sustainability objectives.</div></div>                                                                                                                                                                                                                                 |



Case Study

AI and Strategic Marketing Leadership<sup>178</sup>

AI is increasingly assisting with tactical execution, but strategic marketing leadership in broadcasting remains a low-impact role. A 2024 case study on Iran’s national broadcaster illustrates how AI supports marketing activities such as analysing audience data, automating ad placements, and optimising campaign timing. However, the role of the Head of Marketing remains largely untouched by automation because it requires high-level decision-making, creative direction, and human leadership. While AI enhances targeting and accelerates analytics, the essence of marketing leadership lies in strategic thinking, storytelling, and team management, qualities that current technology cannot fully replicate.

178. Ara Rostamian and Mahnaz Moradi Kamreh, AI in Broadcast Media Management: Opportunities and Challenges, KMAN Publishing Institute, 1 July 2024, <<https://journals.kmanpub.com/index.php/aitechbesosci/article/view/2804/4034>>

Low impacted Role #02 Technical Crew: Audio Engineer

| Roles                                                                                                                                                       | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Audio Engineer</b>                                                                                                                                       | <b>AI / Digital Skills</b> <div><b>1. Digital and AI Fluency</b><div>Proficiency in using digital audio workstations and AI-assisted tools to improve sound quality, automate routine audio tasks, and streamline live and post-production workflows.</div></div> <div><b>2. Sound Mixing</b><div>Ability to balance, blend, and adjust multiple audio sources in real time to deliver clear, consistent, and high-quality sound for television broadcasts.</div></div> |
| <b>Job Purpose:</b> <div>Responsible for setting up and maintaining audio equipment to ensure high-quality sound during live or recorded productions.</div> | <b>Green Skills</b> <div><b>1. Sustainability Awareness</b><div>Ability to equip oneself with knowledge of energy-efficient audio equipment usage and environmentally conscious practices in both studio and on-location sound production.</div></div>                                                                                                                                                                                                                  |



Case Study

AI Assists, but Live Audio Remains Human-Centric<sup>179</sup>

A 2023 case study by BBC Studios shows that live audio production for television remains heavily dependent on human expertise. While AI tools can help with tasks such as noise reduction, auto-levelling, and basic post-production cleanup, live broadcasts still demand real-time human judgement. Audio engineers manage complex sound environments, respond to unexpected issues, and work closely with directors and crew to ensure audio quality matches the production’s visual flow. BBC has experimented with AI-assisted audio systems, but during critical situations such as live interviews, music performances, or outdoor broadcasts, engineers rely on their trained ear and instinct to maintain sound integrity. Despite technological support, the role remains human-centric, with core tasks continuing to require manual control, creative sensitivity, and on-site presence.

179. Mike Armstrong, Research & Development White Paper: From Clean Audio to Object Based Broadcasting, BBC, September 2016, <<https://downloads.bbc.co.uk/rd/pubs/whp/whp-pdf-files/WHP324.pdf>>



In-Demand Skills for AI, Digital, and Green Economy

Training Programmes Available

Essential AI and Digital skills for roles to adopt for business operations enhancements and overall workforce productivity improvements.

List of proposed training programmes are accessible on the MyMAHIR platform.

AI/ Digital Skills

Technical Camera Operations

Platform Knowledge and Deployment

Sound Mixing

Signal Processing

Colour Grading

Network and Systems Administration

Media Data Management

Automation Process Control

Green Skills

Green skills that are needed for roles to integrate sustainability efforts and initiatives into business operations.

Sustainability Awareness

Sustainable Business Practice



# Emerging Roles



Unlike many other sectors, the Broadcasting sector is integrating AI and digital capabilities within existing roles rather than creating entirely new job titles. Despite the rapid advancement of AI tools, Malaysia’s Broadcasting sector has not yet seen the emergence of distinct AI-specific positions.

Instead, AI functions are being absorbed into the responsibilities of current roles, reflecting an industry strategy that focuses on evolving jobs instead of adding new ones. For example, instead of introducing a dedicated AI Content Gatekeeper to review AI-generated material, the task is now part of the expanded scope of content writers, editors, and producers, who must verify and refine AI outputs as part of their everyday work. Similarly, effective prompting, once imagined as a potential standalone role such as a Prompt Strategist, has become a practical skill expected of writers, editors, and producers as they collaborate with tools such as ChatGPT and GenAI to improve efficiency while maintaining content quality and accuracy.

The rise of user-generated content (UGC) and AI-driven short-form videos, such as 30–60 second micro-dramas, is also changing how content is being formed and consumed. Broadcasters are responding by embedding AI and digital tools across production, editorial, and marketing functions, from programme development to backend operations and workflow automation. These advancements accelerate production and enhance creativity, yet the added capabilities are again absorbed into existing positions by requiring professionals to become more digitally fluent and adaptable.

Ultimately, the shift is less about job replacement and more about job redesign. Roles are moving from routine task execution to higher-level oversight, strategic decision-making, and creative judgment. Instead of hiring for AI- or digital-specific roles, broadcasters are prioritising upskilling their current workforce, which explains the absence of formally recognised emerging roles despite widespread technological adoption.



# Chapter 4.3: Recommended Initiatives

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The rapid advancement of AI, Digital, and Green Economy is reshaping the Broadcasting sector. This transformation demands a proactive and collaborative approach to talent development, workforce adaptability, and institutional support. 10 strategic initiatives have been identified to navigate this evolving landscape. These initiatives bring together key stakeholders from government, industry players, academia, and training providers. Their aim is to address the challenges posed by automation, digitalisation, and sustainability mandates, while simultaneously unlocking new opportunities for upskilling, innovation, and inclusive growth. By aligning efforts across all four (4) stakeholder groups, the sector can future-proof its workforce and enhance its competitiveness in a low-carbon, high-tech economy.

Summary of 10 Recommended Initiatives



Government

- IN1**  
Enhance Content Code 2022 to Embed AI Ethics
- IN2**  
Establish AI Content Verification & Disclosure Mechanisms
- IN3**  
Define IP Ownership & Attribution for AI-Generated Broadcast Content
- IN4**  
Strategic Government Support Initiative for the Development of AI-Enabled Virtual Labs and Smart Studios



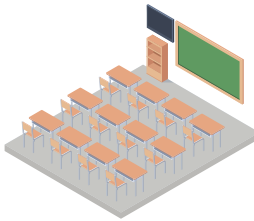
Industry Players

- IN5**  
Establish AI and Digital Focused Internships for Broadcast Technical Roles
- IN6**  
Upskill Mid-Career Broadcast Talent for AI Adoption
- IN7**  
Develop AI and Digital Training Labs for Broadcasting



Academia

- IN8**  
Upskilling Faculty through Industry-based AI & Digital Media Exposure
- IN9**  
Developing AI and Advanced Digital Media Programmes for Industry Needs<sup>180</sup>



Training Providers

- IN10**  
Upskilling Trainers through Industry-based AI & Digital Media Exposure<sup>181</sup>

180. IN9 and IN10 adopt a shared train-the-trainer model to strengthen AI and digital readiness within Malaysia’s media education ecosystem. IN9 targets university lecturers, while IN11 focuses on training providers. Both initiatives aim to bridge the gap between academic delivery and real-world broadcasting practices. By immersing educators in industry-standard tools, workflows, and environments, these efforts ensure that future talent is equipped with skills that are current, practical, and aligned with industry needs.

181. Ibid

Government

IN1 Enhance Content Code 2022 to Embed AI Ethics

This initiative seeks to revise and strengthen the Content Code 2022<sup>182</sup> by incorporating clear AI ethics and transparency guidelines for AI-generated or AI-assisted broadcasting content. Its purpose is to ensure that the Code keeps pace with emerging technological risks such as deepfakes, synthetic voices, and editorial accountability, while still supporting responsible innovation and creativity. By embedding these provisions, the initiative aims to provide broadcasters with practical guidance for ethical AI use, reinforce public trust in media, and maintain accountability in content production. The initiative is intended to involve key stakeholders including MCMC, Content Forum Malaysia (CMCF), and other key industry stakeholders.

| Initiatives                                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN1.1</b><br><b>Establish a Special AI Ethics Advisory Panel</b><br>Form a Special AI Ethics Advisory Panel under CMCF to lead the enhancement of the Content Code 2022.                                                | <ul style="list-style-type: none"><li>• Strengthens audience trust in an AI-enhanced media environment.</li><li>• Ensures broadcasters remain accountable for content integrity even when using GenAI tools.</li><li>• Provides a clear and enforceable legal basis for addressing harmful synthetic content.</li><li>• Equips the industry with operational clarity while supporting the creative use of AI.</li><li>• Strengthens Malaysia’s standing as a regional leader in embedding AI ethics into content regulation.</li></ul> |
| <b>IN1.2</b><br><b>Introduce Mandatory Disclosure Clauses</b><br>Introduce mandatory disclosure clauses for AI-generated or AI-assisted content, including but not limited to labelling deepfakes and synthetic narration. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>IN1.3</b><br><b>Establish Editorial and Human Oversight Rules</b><br>Define editorial responsibility and human oversight requirements for broadcasters using AI tools.                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>IN1.4</b><br><b>Standardised SOPs for AI Content Governance</b><br>Formulate standardised SOPs and compliance checklists to strengthen AI content governance.                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>IN1.5</b><br><b>Raising Awareness of New Content Code Rules</b><br>Conduct awareness campaigns targeting broadcasters, digital creators, and AI providers on new Content Code provisions.                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

182. Communications and Multimedia Content Forum of Malaysia (Content Forum), Content Code: Third Edition, May 2022, <<https://contentforum.my/wp-content/uploads/2022/08/Content-Code-2022.pdf>>

Case Studies

**BBC's Machine Learning Engine Principles<sup>183</sup>**

In the United Kingdom, the BBC's Machine Learning Engine Principles (MLEP) provide a robust internal ethical framework for the use of AI in broadcasting, making them a valuable reference for Malaysia's own Content Code initiative. Similar to Malaysia's approach, the BBC's principles are self-regulatory rather than legislative, guiding how AI is deployed responsibly across editorial and content production activities.

The framework requires clear labelling and disclosure whenever AI is used in narration, visual elements, or summarised reporting, while maintaining editorial responsibility and human oversight at every stage. It also sets out practical governance protocols covering transparency, risk mitigation, and operational safeguards. By embedding these measures, the BBC ensures that AI enhances content creation without compromising editorial integrity, thereby preserving public trust and accountability.

IN2

Establish AI Content Verification & Disclosure Mechanisms

This initiative proposes a comprehensive framework to verify, trace, and disclose AI-generated content in broadcasting, including deepfakes, synthetic voiceovers, and auto-generated news scripts. It aims to equip regulators and broadcasters with practical tools and enforceable standards to ensure transparency and accountability in AI-assisted content. As part of this effort, technical standards and governance procedures will be developed to accurately label and track AI-generated material across broadcasting platforms. It is proposed that the initiative be spearheaded by the National Artificial Intelligence Office (NAIO) with support from the MCMC, providing a clear operational foundation for ethical and responsible AI use in the media sector.

| Initiatives                                                                                                                                                                                                                                                                        | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN2.1</b><br/><b>Defining Clear Labelling Requirements</b><br/>Define clear labelling requirements (disclosure) for all AI-generated content, including scripts, voiceovers, and avatars, thus ensuring transparency through on-screen or in-audio disclosures.</p>          | <p>This initiative supports responsible AI use in broadcasting through the following benefits, which can only be fully achieved with the availability, advancement, and maturity of AI content verification tools:</p> <ul style="list-style-type: none"><li>Builds audience trust by ensuring viewers are aware when content has been generated or influenced by AI.</li><li>Reduces the risk of harm from deepfakes, misinformation, or synthetic narratives, particularly in news and public interest programming.</li><li>Provides clear and consistent guidance to broadcasters on managing AI use within regulatory and ethical boundaries.</li><li>Encourages the development of local AI content verification solutions, while simultaneously strengthening national capability and digital sovereignty.</li></ul> |
| <p><b>IN2.2</b><br/><b>Collaboration with AI Verification Vendors</b><br/>Work with AI verification providers to pilot and implement detection tools capable of identifying and labelling synthetic or manipulated content, particularly from third-party or external sources.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p><b>IN2.3</b><br/><b>Establish Internal AI Content Registry</b><br/>Establish an internal AI Content Registry to record all AI-generated segments used in broadcasts, supporting auditability, content tracking, and regulatory compliance.</p>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

183. BBC, Machine Learning Engine Principles, <[https://downloads.bbc.co.uk/rd/pubs/MLEP\\_Doc\\_2.1.pdf](https://downloads.bbc.co.uk/rd/pubs/MLEP_Doc_2.1.pdf)>

Initiatives (Continued)

**IN2.4**  
**Conduct AI Content Management Training**  
Conduct training to equip editorial, production, and legal teams with the knowledge and skills needed to manage AI usage, maintain traceability standards, and implement disclosure requirements effectively.

Benefits (Continued)

Case Studies

**Microsoft's Responsible Practices for Synthetic Media<sup>184</sup>**

Microsoft offers a practical governance framework for managing synthetic media, incorporating Content Credentials and disclosure indicators to track and label AI-generated content. This approach is particularly relevant to broadcasting, as it addresses challenges such as deepfakes, synthetic voices, and audience transparency. Key features include the use of tamper-evident metadata based on the C2PA standard to record the origin and history of AI-generated material, as well as visual and audio disclosure signals, such as "Generated by AI," to promote accountability. The framework enables large-scale verification of content authenticity, supports the detection of manipulation, and helps preserve editorial integrity. By ensuring transparent disclosure, it also fosters public trust in synthetic media while providing a governance model that can be adapted for the Broadcasting sector.

IN3

Define IP Ownership & Attribution for AI-Generated Broadcast Content

This initiative proposes a legal framework to clarify ownership, attribution, and ethical boundaries for AI-generated broadcast content. It seeks to establish who holds rights over AI-created material, how proper attribution should be managed, and the legal implications when AI replicates real people's voices or likenesses. As broadcasters increasingly adopt synthetic voiceovers, AI avatars, and auto-generated scripts, the lack of legal clarity can create compliance and reputational risks. It is recommended that the initiative be spearheaded by the MCMC, the Intellectual Property Corporation of Malaysia (MyIPO), the Ministry of Communications, and legal experts, to ensure that AI-driven creativity respects intellectual property rights, consent, and ethical standards.

| Initiatives                                                                                                                                                                                                                                                     | Benefits                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN3.1</b><br/><b>Develop Broadcast IP and Attribution Framework</b><br/>Develop a Broadcast IP and Attribution Framework that clarifies ownership rights, recognises co-created content, and sets consent policies for AI-generated personas.</p>         | <ul style="list-style-type: none"><li>Establishes clear ownership and usage rights for AI-generated broadcasting content, minimising ambiguity.</li><li>Safeguards public figures and creators against unauthorised replication of their voice, likeness, or identity.</li></ul> |
| <p><b>IN3.2</b><br/><b>Establish an AI Content Registration Pilot</b><br/>Launch an AI Content Registration Pilot enabling broadcasters to log and timestamp AI-generated outputs, supporting proof of origin, rights verification, and dispute resolution.</p> |                                                                                                                                                                                                                                                                                  |

184. Partnership on AI, How Microsoft and LinkedIn gave users detailed context about media on the professional networking platform, <<https://partnershiponai.org/wp-content/uploads/2024/11/case-study-microsoft.pdf>>



| Initiatives (Continued)                                                                                                                                                                                                                           | Benefits (Continued)                                                                                                                                                                                                                                                |
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| <b>IN3.3</b><br><b>Review and Align Copyright and IP Laws</b><br>Review and update copyright and IP legislation to encompass AI-generated works, including human–AI collaborations and derivative content.                                        | <ul style="list-style-type: none"><li>Allows broadcasters to pursue innovation confidently within established legal and ethical boundaries.</li><li>Reinforces Malaysia’s standing as a regional leader in modernising IP laws for AI media across ASEAN.</li></ul> |
| <b>IN3.4</b><br><b>Introduce Mandatory Attribution Rules</b><br>Implement mandatory attribution rules for all AI-assisted broadcast content across visuals, audio, and scripts.                                                                   |                                                                                                                                                                                                                                                                     |
| <b>IN3.5</b><br><b>Roll Out Legal Training and Compliance Programmes</b><br>Deliver legal training and compliance programmes to equip editorial, legal, and production teams to manage rights, ethical responsibilities, and risks in the AI era. |                                                                                                                                                                                                                                                                     |

**Case Studies**

**Legal and Ethical Implications of AI-Generated Content in Intellectual Property Law<sup>185</sup>**

As AI-generated content becomes more prevalent in broadcasting, traditional intellectual property laws face challenges in defining authorship, ownership, and attribution for synthetic scripts, voices, and likenesses. Key considerations include establishing legal models that support AI-assisted and co-created content ownership, ensuring fair distribution of rights, and implementing frameworks for attribution and consent protections for synthetic identities in media. These measures help policymakers and broadcasters address gaps in IP law, providing guidance on managing rights, attribution, and content registration for AI-assisted creations while maintaining ethical standards.



185. Haolong Wen, Science of Law Journal: Legal and Ethical Implications of AI-Generated Content in Intellectual Property Law, Clausius Scientific Press, 2024, <[https://www.clausiuspress.com/assets/default/article/2024/12/26/article\\_1735205161.pdf](https://www.clausiuspress.com/assets/default/article/2024/12/26/article_1735205161.pdf)>

**IN4**

**Strategic Government Support Initiative for the Development of AI-Enabled Virtual Labs and Smart Studios**

This initiative aims to mobilise public sector leadership to co-fund and facilitate the development of AI- and digital-ready training and production infrastructure. It addresses the critical infrastructure gap in media and broadcasting by supporting the establishment of AI-enabled virtual labs and smart studios nationwide. Through strategic government support such as funding, tax incentives, and institutional partnerships, the initiative enables the private sector to implement these facilities effectively and sustainably. By providing hands-on access to advanced production tools, it allows Malaysian talent and industry players to train, experiment, and scale in future-ready environments. This initiative strengthens skills development and nurtures a highly capable next generation of media and broadcasting professionals.

| Initiatives                                                                                                                                                                                                                                                                                                       | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>IN4.1</b><br><b>Introduce Targeted Tax Incentives</b><br>Introduce targeted tax incentives such as income tax exemptions, capital allowances, or reinvestment incentives to ease the financial burden for companies investing in AI-enabled labs and smart studios.                                            | <ul style="list-style-type: none"><li>Offers nationwide access to AI-enabled, advanced training infrastructure.</li><li>Minimises redundant infrastructure by encouraging shared, government-supported labs.</li><li>Drives innovation in public education and supports upskilling and retraining for future broadcasting roles.</li><li>Encourages co-investment from technology providers and industry studios by lowering capital risk.</li><li>Strengthens Malaysia’s role as a regional creative technology hub with inclusive, future-ready facilities.</li></ul> |
| <b>IN4.2</b><br><b>Provide Matching Grants/ Co-funding Support</b><br>Provide matching grants or co-funding to support the design, development, and deployment of AI-enabled lab and smart studio infrastructure throughout the sector.                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>IN4.3</b><br><b>Facilitate Partnerships with Public Institutions</b><br>Facilitate partnerships with public institutions by integrating AI-enabled labs into TVETs, media faculties, and digital academies through Memorandum of Understanding (MoU) and aligned curriculum development.                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>IN4.4</b><br><b>Continuous Maintenance and Upgrading of AI-enabled Labs and Smart Studios</b><br>Ensure continuous maintenance and upgrading of AI-enabled labs and smart studios with the latest tools, technologies, and systems to stay aligned with industry standards and foster innovation.              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>IN4.5</b><br><b>Alignment of Stakeholders Interest of AI Facilities</b><br>Ensure alignment of interests among broadcasters, industry players, and private sector stakeholders to promote shared responsibility, foster active participation, and maximise the long-term utilisation of AI-enabled facilities. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Initiatives (Continued)                                                                                                                                                                         | Benefits (Continued) |
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| <b>IN4.6</b><br><b>Provide Access to Software Technologies</b><br>Provide access to software technologies, including large language model tools, to facilitate training and content production. |                      |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <b>CoSTAR Virtual Production Network<sup>186</sup></b><br>The United Kingdom Government, through UK Research & Innovation (UKRI), funded the CoSTAR initiative to support the creative industry with advanced production infrastructure. The programme focuses on developing high-tech studios that enable AI-driven training, digital content creation, and collaboration between academia, industry, and regional talent hubs. Key features include the funding of four (4) high-tech studios across the UK, equipped with LED stages, AI-powered rendering tools, motion capture, and real-time cloud workflows. The programme places strong emphasis on inclusive access for students, SMEs, and regional content creators. The initiative provides a public policy model that Malaysia can leverage, combining infrastructure investment, regulatory incentives, and education-industry collaboration to transform broadcasting training environments. |
| <b>BBC Studios AI Creative Lab<sup>187</sup></b><br>The BBC Studios AI Creative Lab in the United Kingdom provides a dedicated environment for AI experimentation and innovation in content production. The lab illustrates how a public broadcaster can lead infrastructure development, enabling producers and technologists to train, test, and prototype AI applications using real-world tools. Key features include supporting use cases such as AI-assisted writing, metadata generation, narration, and visual effects, and serving both training and research and development purposes across multiple content genres. The initiative allows safe experimentation with AI tools within real production workflows, demonstrates a responsible, public-led model for digital innovation infrastructure, and offers a blueprint for shared-access AI labs aligned with national development goals.                                                    |

186. Loughborough University, Loughborough to play key role in new Government unit established to maximise the potential of the UK creative industries, 15 June 2023, <<https://www.lboro.ac.uk/news-events/news/2023/june/new-uk-unit-creative-industries/>>  
187. Televisual, BBC Studios launches AI Creative Lab, 24 July 2025, <<https://www.televisual.com/news/bbc-studios-launches-ai-creative-lab/>>

Industry Players

IN5 Establish AI/ Digital-Focused Internships for Broadcast Technical Roles

This initiative aims to launch structured internships for broadcast roles that utilise AI and digital production tools. Broadcasters and studios are encouraged to offer internships focused on AI-integrated positions, including AI-powered camera operators, virtual production assistants, and smart post-production editors. These programmes provide young talent with hands-on exposure to real-world tools and workflows, equipping them with practical, job-ready skills in AI-enhanced broadcast environments and fostering a technologically proficient workforce for the future of media production.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                        | Benefits                                                                                                                                                                                                                                          |
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| <b>IN5.1</b><br><b>Equip Participating Companies with AI and Digital Tools</b><br>Ensure that participating companies have AI and digital production tools in place to demonstrate readiness before offering structured internship placements.                                                                                                                                                     | <ul style="list-style-type: none"><li>Provides interns with hands-on experience using real AI and digital broadcasting tools, while allowing them to contribute to experimental or non-core projects in a safe, supervised environment.</li></ul> |
| <b>IN5.2</b><br><b>Collaborate with Local Institutions</b><br>Collaborate with local institutions, including TVETs and universities, to formalise internship pathways and integrate them with academic credit systems.                                                                                                                                                                             | <ul style="list-style-type: none"><li>Develops a pipeline of AI-ready junior talent, helping to reduce future onboarding and training costs.</li></ul>                                                                                            |
| <b>IN5.3</b><br><b>Role-Specific AI and Digital Internship Tracks</b><br>Encourage companies already employing AI or digital broadcast tools to provide role-specific internship tracks, such as prompt animators, AI video editors, or AI-assisted content creators, involving interns in real projects using tools like auto-tracking cameras, AI subtitle engines, or smart scheduling systems. | <ul style="list-style-type: none"><li>Reinforces partnerships between broadcasters and educational institutions through structured and formal internship programmes.</li></ul>                                                                    |
| <b>IN5.4</b><br><b>Intern Support and Portfolio Development</b><br>Support interns with guidance and portfolio-building opportunities that allow them to showcase AI- or digitally-assisted work, such as video edits or scripts, along with credit letters confirming their contributions.                                                                                                        | <ul style="list-style-type: none"><li>Facilitates early talent discovery and recruitment of broadcast professionals prepared for AI-enhanced workflows.</li></ul>                                                                                 |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <b>IMmersion SG Infocomm Media Internship Programme<sup>188</sup></b><br>The IMmersion SG Infocomm Media Internship Programme in Singapore, our neighbouring market, places interns in roles involving AI automation, enterprise tools, and digital transformation, including GenAI applications. Here, interns receive structured guidance, gain exposure to cross-department projects, as well as participate in innovation pilots. Key practices include curated, role-based project placements aligned with digital innovation needs and industry-agency co-ownership to ensure real-world relevance and structured learning. Thus far, the programme has produced a new wave of digitally fluent interns contributing directly to AI-driven workstreams and offers a replicable model for structured, industry-led internships in AI-intensive sectors. |

188. The Infocomm Media Development Authority (IMDA), IMmersion SG Infocomm Media Internship Programme, 2024, <<https://file.go.gov.sg/imda-internship-kit-jan2024.pdf>>



IN6

Upskill Mid-Career Broadcast Talent for AI Adoption

This initiative aims to upskill experienced broadcast professionals for AI-era roles through structured industry training and mentorship. It addresses the digital talent gap within the broadcasting workforce, particularly among mid-career and senior staff who may risk being left behind as AI tools reshape production workflows. In the spirit of inclusivity and rather than displacing this experienced group, broadcasters are encouraged to provide targeted upskilling, structured mentorship, and collaborative learning opportunities, enabling professionals to transition into AI-enhanced roles while preserving valuable institutional knowledge.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <p><b>IN6.1</b><br/><b>Leverage Existing Frameworks for Targeted Upskilling</b></p> <p>TalentCorp’s MyMahir platform and Malaysia’s first Communications &amp; Multimedia (C&amp;M) Skills Framework provide strong foundations for this initiative by identifying AI-impacted roles and critical broadcasting skills. These tools enable industry players to select suitable modular upskilling programmes from available training providers, such as TVETs, Regional Training Hubs, and MDEC, giving companies flexibility to choose the programmes that best meet their employees’ needs.</p> | <ul style="list-style-type: none"><li>Retains experienced broadcast professionals by updating their skills to align with evolving AI-driven production workflows.</li><li>Increases confidence and eases adoption of AI through targeted, role-specific upskilling.</li><li>Supports mid-career professionals in transitioning smoothly into roles that combine traditional broadcasting expertise with AI technologies.</li><li>Promotes cross-generational collaboration and shared learning within teams.</li><li>Highlights the industry’s commitment to inclusivity by providing upskilling opportunities at all career stages, fostering a resilient, future-ready workforce prepared for AI-driven changes.</li></ul> |
| <p><b>IN6.2</b><br/><b>Recognise Participant Achievements</b></p> <p>Acknowledge completion and skill development through internal credentials, digital badges, or portfolio showcases, endorsed by broadcasters and supported by MCMC or relevant industry skills bodies.</p>                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b>IN6.3</b><br/><b>Implement Reverse-mentorship Programmes</b></p> <p>Pair senior staff with younger, digital-native teams to foster knowledge exchange, coordinated by HR departments.</p>                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <p><b>Upskilling for Career Mobility at PepsiCo<sup>189</sup></b></p> <p>PepsiCo launched a comprehensive, forward-looking upskilling initiative targeting mid-career employees to enable transitions into tech-focused roles. Programmes included mentorship, access to diplomas and degrees, and applied digital training, all aligned with career mobility objectives. Key practices combined employee-driven learning goals with a structured, company-sponsored curriculum, giving participants autonomy while supporting broader business transformation. The initiative prioritised career mobility within evolving roles, ensuring existing staff were redeployed rather than replaced. This approach allowed PepsiCo to retain mid-career and senior staff by equipping them with skills relevant to emerging technologies and job scopes. It also serves as a replicable model for organisations navigating rapid digital change.</p> |

189. Aspen Institute, Case Study: Upskilling for Career Mobility at PepsiCo, August 2023, <<https://www.aspeninstitute.org/wp-content/uploads/2025/05/Case-Study-UpSkillng-for-Career-Mobility-at-Pepsico.pdf>>

IN7

Develop AI/ Digital Training Labs for Broadcasting

This initiative focuses on creating broadcasting-focused training labs equipped with AI and digital tools, providing students with hands-on experience in real media technologies. By fostering collaboration between broadcasters, industry partners, and academic institutions, these labs aim to develop sector-specific AI and digital skills, preparing Malaysia’s future media workforce for an AI-enhanced broadcasting landscape.

| Initiatives                                                                                                                                                                                                                                                                                                                                     | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p><b>IN7.1</b><br/><b>Establish Broadcasting-focused Training Labs Equipped with AI and Digital Tools</b></p> <p>Develop broadcasting-focused training labs equipped with AI and digital tools through partnerships between academia and broadcasters, providing students with structured, hands-on experience in real media environments.</p> | <ul style="list-style-type: none"><li>Cultivate a skilled talent pipeline by equipping graduates with practical AI-focused broadcasting experience.</li><li>Enhance industry leadership in AI while strengthening university partnerships to align emerging talent with sector needs.</li><li>Support national development and fulfil corporate social responsibility by contributing to digital readiness and workforce capacity.</li><li>Foster innovative thinking in broadcasting through student projects and fresh perspectives that inspire workflow improvements.</li></ul> |
| <p><b>IN7.2</b><br/><b>Conduct Regular Lab-based Workshops</b></p> <p>Deliver regular lab-based workshops on topics such as AI and digital editing, virtual production, and newsroom automation, led by industry professionals.</p>                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>IN7.3</b><br/><b>Complement Core Lab Activities with Project-based Learning Opportunities</b></p> <p>Enhance core lab activities with project-based learning opportunities, allowing students to apply AI and digital tools in real-world broadcasting scenarios for deeper practical experience.</p>                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>IN7.4</b><br/><b>Ensure Free/Subsidised Access for Students</b></p> <p>Secure free or subsidised access for students to promote broad participation and inclusivity.</p>                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p><b>HKTV AI Training Lab<sup>190</sup></b></p> <p>Hong Kong Television Network Limited (HKTV) established an AI Training Lab to provide university students with hands-on, practical experience using AI tools in broadcasting and live commerce. The lab offers free workshops focused on skills such as AI video editing, virtual production, and newsroom automation. Industry professionals lead the sessions, ensuring students gain real-world, job-relevant experience. Developed in collaboration with universities, the programme aligns learning outcomes with industry needs.</p> <p>The initiative prepares graduates with practical AI skills for broadcasting roles at relevant organisations thus reducing retraining costs for employers. It also strengthens collaboration between broadcasters and universities, ensuring graduates are ready to meet real industry demands and contribute effectively to AI-enhanced workflows.</p> |

190. HKTV, HKTV Held AI Workshop for Talents, <[https://ir.hktv.com.hk/uploads/1722414396081-AIWorkshop\\_ENG\\_V2.pdf](https://ir.hktv.com.hk/uploads/1722414396081-AIWorkshop_ENG_V2.pdf)>

Academia

IN8 Upskilling Faculty through Industry-Based AI & Digital Media Exposure

This initiative aims to equip university lecturers with practical, hands-on experience in AI-driven broadcasting production workflows, enabling them to teach up-to-date and sector-relevant AI and digital skills to students. Recognising that national curriculum reforms often take time to incorporate sector-specific digital competencies, the programme provides short-term industry attachments and collaborative projects with broadcasters. These real-world experiences allow faculty to gain direct exposure to AI tools and media production workflows, helping them refresh and enhance their teaching content. Ultimately, this initiative ensures students are better prepared for the evolving digital media and broadcasting landscape.

| Initiatives                                                                                                                                                                                                                                                                                                                       | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| <b>IN8.1</b><br><b>Facilitate Short-term Faculty Attachments</b><br>Coordinate short-term faculty attachments or job-shadowing in broadcasting companies, allowing lecturers to observe and participate in real-time production environments that use AI and digital tools.                                                       | <ul style="list-style-type: none"><li>Keeps faculty up to date with emerging AI and digital technologies, improving teaching quality by integrating current tools and industry practices into the curriculum.</li></ul>                                                                                                                                                                                                            |
| <b>IN8.2</b><br><b>Enhance Existing Broadcasting Labs with Latest Tools</b><br>Upgrade existing broadcasting labs at universities with the latest AI and digital technologies, enabling lecturers to apply their industry experience in practical teaching environments that mirror real-world setups.                            | <ul style="list-style-type: none"><li>Provides a safe, controlled environment for faculty to develop, test, and refine digital learning materials before introducing them to students, ensuring relevance and effectiveness.</li></ul>                                                                                                                                                                                             |
| <b>IN8.3</b><br><b>Encourage Joint Development of AI and Digital Micro-courses</b><br>Promote the joint development of short, stackable AI and digital micro-courses involving lecturers, industry experts, and training providers, helping translate real-world experience into modular, relevant teaching content for students. | <ul style="list-style-type: none"><li>Aligns academic curricula with real-world industry workflows and standards, enhancing graduate employability by equipping them with practical, in-demand skills.</li><li>Strengthens ongoing collaboration between academia and industry partners, fostering continuous feedback and joint development to ensure education remains responsive to technological and market changes.</li></ul> |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| <b>Seberang Perai Polytechnic Industrial Attachment Programme<sup>191</sup></b><br>As part of the Polytechnic Transformation Plan, the Seberang Perai Polytechnic Industrial Attachment Programme provided a two-month placement for 449 lecturers across 381 companies, giving them hands-on industry experience to enhance teaching effectiveness. Lecturers were assigned to organisations aligned with their respective fields, with priority placements in multinational companies such as Intel and Motorola that offered structured training and practical exposure. This programme enabled lecturers to deepen their practical knowledge, bringing real-world insights back to the classroom. It strengthened both professional and personal competencies, allowing lecturers to share the latest industry practices with students and make teaching and learning more effective overall. |

191. Basir Ahmad Mohamad Fadzil and Abd Rashid Kamarul Ariffin, Journal of Sustainable Development: Lecturers’ Industrial Attachment Programme to Increase Lecturers’ Soft Skill and Technological Competencies for Global Stability, January 2011, <[https://www.researchgate.net/publication/49607820\\_Lecturers%27\\_Industrial\\_Attachment\\_Programme\\_to\\_Increase\\_Lecturers%27\\_Soft\\_Skill\\_and\\_Technological\\_Competencies\\_for\\_Global\\_Stability\\_and\\_Security](https://www.researchgate.net/publication/49607820_Lecturers%27_Industrial_Attachment_Programme_to_Increase_Lecturers%27_Soft_Skill_and_Technological_Competencies_for_Global_Stability_and_Security)>

| Case Studies (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <b>Manchester’s Model for Academic-Industry Collaboration<sup>192</sup></b><br>In the United Kingdom, the University of Manchester implemented a part-time industrial secondment programme in which lecturers were placed at Britest Limited, an SME specialising in sustainable process design, to gain industry insights and strengthen academic–industry collaboration. Funded through the Flexible Talent Mobility Account (FTMA), the initiative was designed as a two-way knowledge exchange, allowing academics to spend part of their time embedded in industry. Lecturers gained exposure to SME innovation processes and commercial practices, broadening their understanding of real-world applications. The programme also facilitated joint research, training, and innovation initiatives, fostering long-term collaboration between academia and industry. As a result, it accelerated the application of biotechnology research in practice, supported the development of a more industry-informed curriculum and research supervision, and contributed to professional growth by enabling leadership progression for participating academics. |

IN9 Developing AI and Advanced Digital Media Programmes for Industry Needs

This initiative aims to align university curricula with the evolving needs of the media and broadcasting industry by introducing comprehensive, AI-specialised degree programmes. Currently, Malaysia has limited full-fledged courses in AI and digital technologies for media. Most programmes still focus on traditional areas such as linear TV production, news writing, and broadcast journalism, providing minimal exposure to tools like virtual production or machine learning. By developing AI-focused degrees, universities can cultivate hybrid talent equipped with both traditional broadcasting skills and advanced digital competencies, ensuring graduates are prepared to meet the demands of a tech-driven media landscape.

| Initiatives                                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <b>IN9.1</b><br><b>Develop Partnership with Industry Stakeholders</b><br>Partner with industry stakeholders to develop new academic programmes that integrate AI with media production.                                    | <ul style="list-style-type: none"><li>Industry-Relevant Programmes equip graduates with skills closely aligned to both current and future needs in AI and digital media.</li></ul>                                                                                                                                                                                                                                                                       |
| <b>IN9.2</b><br><b>Incorporate AI and Digital Technologies into Courses</b><br>Embed emerging AI and digital technologies into coursework, supported by industry-endorsed modules and expert-led sessions.                 | <ul style="list-style-type: none"><li>Practical technical proficiency is developed through university-based labs, enabling students to work with real-world tools and industry-standard media workflows.</li></ul>                                                                                                                                                                                                                                       |
| <b>IN9.3</b><br><b>Create Shared Smart Labs for Universities</b><br>Establish shared smart studios and labs within universities, with co-funding support, to provide practical, hands-on training in AI-driven production. | <ul style="list-style-type: none"><li>Flexible learning pathways let students upskill in specialised AI-media areas via modular micro-credentials, making programmes accessible to those without a technical background.</li><li>Short-term industry placements and international exposure for lecturers help academic staff stay up-to-date with rapidly evolving AI and media practices, enhancing teaching quality and programme relevance.</li></ul> |

192. Elli Marinopoulou, Case study of A Secondment Supported By Translation Manchester and funded by the Flexible Talent Mobility Account (FTMA) Award: Dr Kirk Malone, The University of Manchester, 12 February 2025, <[https://www.translation.manchester.ac.uk/2025/02/12/case-study-of-a-secondment-supported-by-translation-manchester-and-funded-by-the-flexible-talent-mobility-account-ftma-award-dr-kirk-malone/?utm\\_source=](https://www.translation.manchester.ac.uk/2025/02/12/case-study-of-a-secondment-supported-by-translation-manchester-and-funded-by-the-flexible-talent-mobility-account-ftma-award-dr-kirk-malone/?utm_source=)





| Initiatives (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Benefits (Continued) |
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| <p><b>IN9.4</b><br/><b>Introduce Elective AI and Digital Courses</b><br/>Offer short, elective AI and digital courses that students can take alongside their main programme or to transition into the field.</p> <p><b>IN9.5</b><br/><b>Provide Short-Term Industry and International Experiences</b><br/>Enable short-term industry placements or international exchange opportunities for lecturers to gain practical experience with cutting-edge AI tools and media production workflows.</p> |                      |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <p><b>Southern Illinois University’s Model for Digital and Emerging Media Integration<sup>193</sup></b><br/>At Southern Illinois University in the United States, the Bachelor of Arts in Radio, Television &amp; Digital Media integrates traditional broadcasting training with exposure to digital and emerging technologies. While not formally branded as an “AI in broadcasting” degree, the programme equips students with both conventional skills, such as television production, audio editing, and broadcast journalism, and digital media competencies, including animation, interactive media, and electronic news gathering. Students gain hands-on experience using professional equipment and production studios, ensuring practical familiarity with industry-standard workflows. This approach produces graduates with hybrid capabilities across traditional and digital media roles, enhancing their readiness for careers in multimedia production and digital broadcasting, and aligning closely with industry expectations for digitally fluent broadcast professionals.</p> |

193. Southern Illinois University, Bachelor of Arts in Radio, TV, and Digital Media, <<https://academics.siu.edu/comm-media/radio-television-digital-media/bachelors.php>>

Training Providers

IN10 Upskilling Trainers through Industry-Based AI & Digital Media Exposure

This initiative aims to upskill trainers by providing hands-on, industry-based exposure to AI and digital media workflows in broadcasting. By embedding real-world tools, technologies, and production processes into their experience, trainers gain practical knowledge that they can translate into effective, industry-relevant training programmes. Currently, Malaysia’s broadcasting courses offer limited exposure to modern AI tools and digital production techniques, leaving many trainers without first-hand experience in cloud-based editing, automation, and virtual studio environments. Through structured industry placements and immersion programmes, trainers can acquire practical skills, enhance their understanding of AI-driven workflows, and deliver simulation-based, hands-on training that aligns with current broadcasting standards and digital industry needs.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN10.1</b><br/><b>Facilitate Short-term Industry Attachments</b><br/>Organise short-term industry attachments or job-shadowing programmes for certified broadcasting trainers at media companies or tech firms, enabling them to observe AI-driven production workflows and gain practical, real-time insights.</p> <p><b>IN10.2</b><br/><b>Equip Training Institutions with Broadcasting Labs</b><br/>Provide training institutions with broadcasting labs equipped with the latest AI and digital tools, allowing trainers to apply their industry experience in a hands-on, realistic environment that mirrors professional production setups.</p> <p><b>IN10.3</b><br/><b>Jointly Create Modular AI and Digital Courses</b><br/>Encourage collaborative development of modular, stackable AI and digital training courses by bringing together trainers, industry experts, and content developers, helping translate industry exposure into relevant, implementable learning materials for students.</p> | <ul style="list-style-type: none"><li>Trainers acquire hands-on experience with AI and digital broadcasting tools through industry attachments, allowing them to deliver practical, simulation-based training that enhances trainee learning.</li><li>Training materials are aligned with real-world workflows, bridging the gap between classroom or virtual instruction and actual studio environments.</li><li>Participants gain stronger preparation for AI-enabled broadcasting roles, boosting their employability and value to industry employers.</li></ul> |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>TAFE NSW’s Industry Consultation Policy for Trainer Upskilling<sup>194</sup></b><br/>TAFE NSW, Australia’s largest vocational education provider, implements a formal Industry Consultation Policy to ensure trainers remain connected with evolving industry practices. Under this policy, trainers and assessors participate in short-term industry placements, site visits, and collaborative projects with employers and industry partners. Feedback from industry is incorporated into curriculum design, training delivery, and assessment processes, helping trainers keep their skills and knowledge aligned with current technologies and professional standards. All engagement is documented to meet TAFE’s quality assurance and national compliance requirements. This approach ensures trainers provide practical, up-to-date instruction, strengthens the talent pipeline by equipping learners with job-relevant skills, and fosters ongoing collaboration between the education sector and employers.</p> |

194. TAFE NSW, Industry Consultation Policy, 4 July 2025, <<https://cd.tafensw.edu.au/api/-/media/Files/PDFs/Policies-and-Forms/TAFE-NSW-Industry-Consultation-Policy.>>

Taking into account the initiatives proposed, moving forward, these are the

**Top 5 Initiatives**

needed to kickstart the workforce transformation towards AI, Digital, and Green Economy to ensure their successful implementation

1 |  GOVERNMENT

**Establishing AI content verification and disclosure mechanisms** enhances public trust and content credibility by ensuring transparency in AI-generated outputs, aligning with ethical broadcasting standards and regulatory requirements.

2 |  INDUSTRY PLAYERS

**Establishing AI and Digital internships** equips broadcast technical talent with real-world experience, accelerates job readiness, and addresses immediate skill gaps for entry-level industry roles.

3 |  ACADEMIA

**Upskilling faculty through industry-based AI and digital media exposure** ensures university lecturers gain up-to-date production knowledge, enabling them to teach relevant, practical AI and digital skills to students entering the broadcasting field.

4 |  ACADEMIA

**Developing AI and advanced digital media programmes aligned with industry needs** ensures that academic content keeps pace with evolving sector standards and technologies, providing students with future-proof capabilities.

5 |  TRAINING PROVIDERS

**Upskilling trainers through industry-based AI and digital media exposure** strengthens the quality of training delivery, as trainers gain hands-on experience with real broadcast workflows, tools, and AI applications, ensuring that future talent is industry-ready.

# Conclusion

The study highlights that the Broadcasting sector’s success depends on its ability to develop and adapt its most valuable resource: its workforce. As job roles evolve and the demand for advanced skills increases, the sector faces not only challenges but also significant opportunities for career advancement and industry leadership.

Despite the sector’s meaningful growth, strategic importance, and strong alignment with the national agenda, many traditional roles are evolving by integrating AI and digital capabilities rather than creating entirely new job titles. To remain competitive in this changing landscape, the industry must proactively invest in human capital through targeted upskilling and reskilling initiatives to redesign roles and stay relevant.

The five (5) strategic initiatives proposed within this study offer a comprehensive and collaborative roadmap designed to empower Malaysia’s Broadcasting workforce. These recommendations

advocate for robust talent development ecosystems, from fostering industry-academia partnerships and implementing cutting-edge training programmes to establishing clear career pathways and embracing continuous upskilling. Each initiative is designed to ensure that individuals are not just adapting to change, but actively shaping the sector’s future by acquiring skills relevant to the rise of AI, Digital, and Green Economy.

Ultimately, successfully navigating this transformation hinges on a sustained, collective commitment to talent development. By embracing the strategic recommendations outlined, Malaysia’s Broadcasting sector can proactively invest in its people, cultivating a highly skilled, digitally fluent, and sustainability-aware workforce. This collaborative endeavour, championed through the GIAT model and supported by platforms like MyMahir, will be fundamental in securing the sector’s long-term resilience, achieving national development goals, and reinforcing its global competitive edge in the evolving built environment.

Key trends impacting existing roles:



Artificial Intelligence



Digital



Green Economy





# Impact Study of Artificial Intelligence, Digital, and Green Economy on the Malaysian Workforce Phase 2, Volume 2

Sector:  
**Communications &  
Multimedia:  
Postal and Courier**



Chapter 5.1:

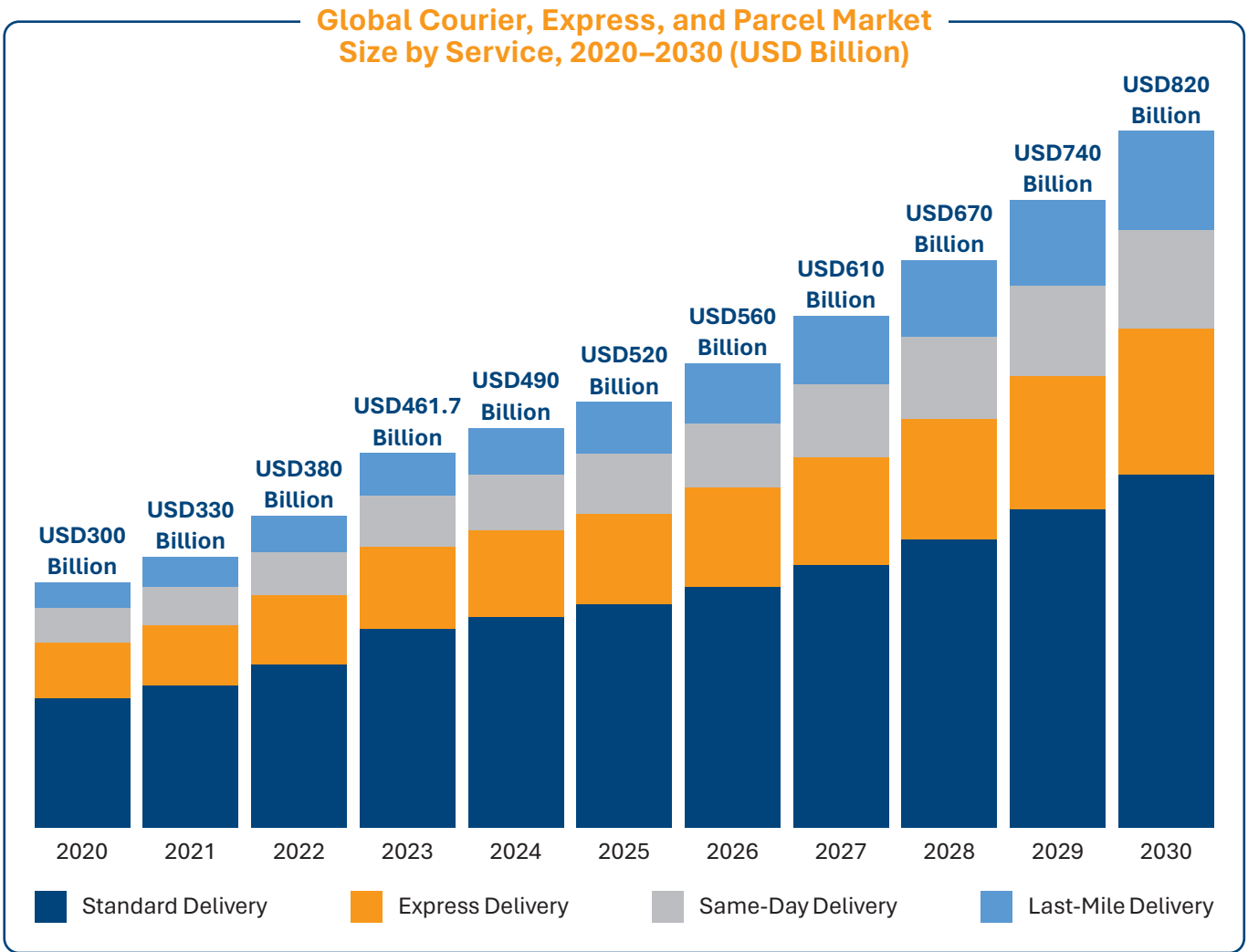
# Sector Overview

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# Overview of Global Trends in the Postal and Courier Sector

The global Postal and Courier sector is currently in a state of significant transformation, driven by two (2) primary forces: widespread digital disruption and growing sustainability demands. The sector is rapidly adapting from its traditional reliance on physical mail to a dynamic, technology-driven ecosystem centred on parcel logistics and integrated digital services.



Note: Data as of 10 December 2024<sup>195</sup>

This shift is reflected in the strong growth of the Courier, Express, and Parcel (CEP) market. Valued at USD462 billion (RM2.17 trillion) in 2023, the global CEP market is projected to reach USD925 billion (RM4.35 trillion) by 2030, representing a remarkable compound annual growth rate (CAGR) of 10.6% from 2024 to 2030. This growth is fuelled by the continued rise of e-commerce, increasing consumer expectations for faster and more flexible delivery, and a broader embrace of digital and sustainable innovation by sector operators.<sup>196</sup>

Despite this robust growth, the sector faces key challenges, including high operating costs, labour shortages, and the imperative for more environmentally friendly delivery models. These pressures are prompting a greater focus on investments in electric fleets, route optimisation, and green logistics strategies.

195. Grand View Research. (n.d.). Courier, express and parcel market report. <<https://www.grandviewresearch.com/industry-analysis/courier-express-and-parcel-market-report>>

196. Ibid

## Key Global Trends Shaping the Postal and Courier Sector

Globally, the Postal and Courier sector is undergoing a profound evolution, with distinct but complementary trends emerging across its sub-sectors. As traditional letter delivery continues to decline, postal operators are strategically pivoting toward parcel logistics, while courier services are expanding to meet the surging demand for speed and flexibility. These sub-sectors are adapting through digital modernisation, green initiatives, and service diversification, reinforcing their positions as crucial pillars of the global delivery ecosystem.

**Postal Services: Decline in Traditional Mail**

- One of the most defining global trends is the ongoing decline in letter and direct mail volumes. This decline is a direct result of the widespread adoption of digital communication channels, such as email, online billing, and e-documents, which have significantly reduced the need for physical mail.<sup>197</sup>
- In response, postal operators are strategically consolidating sorting and processing centres. They are leveraging technologies such as AI-based analysis to streamline their networks, eliminate redundancies, and cut fixed costs, thereby achieving economies of scale in an environment of shrinking letter volumes.<sup>198</sup>

**Postal Services: Shift Towards Parcel Delivery and Diversification**

- The decline in mail revenue has been offset by the explosive growth of parcel delivery, which has become the fastest-growing segment of the Postal sector, largely driven by the rise of global e-commerce. To capitalise on this growth and create new revenue streams, postal operators are diversifying their service portfolios beyond traditional mail to include parcel logistics, financial services, retail, hybrid mail, and digital platforms.<sup>199,200</sup>
- A notable example is PostBank Kenya, which has utilised its extensive postal network and agency banking to provide essential financial services to underserved rural populations. Through partnerships with mobile wallet services, PostBank allows users to conduct transactions and open accounts via local postal branches or agents. This mobile-first, branchless model not only promotes financial inclusion and the adoption of digital tools but also helps sustain the postal network by generating additional revenue. This global trend toward diversification is accelerating across various postal agencies worldwide.<sup>201</sup>

**Postal Services: Digital Adoption**

- Technology is a major driver of modernisation in the postal sector, with AI, automation, and big-data analytics identified as top investment priorities. Operators are scaling AI to enhance customer convenience and reduce costs through innovations such as computer-vision sortation, Internet of Things (IoT) tracking, and predictive route optimisation. These technologies are crucial for streamlining workflows, improving delivery accuracy, and managing the increasingly complex volumes of parcels more efficiently. Overall, postal providers are moving away from legacy letter delivery models and investing heavily in digital infrastructure and diversified revenue streams to remain competitive.<sup>202</sup>

197. Zion Market Research. (2025). Postal services market size, trends & growth outlook (2025–2034). LinkedIn. <<https://www.linkedin.com/pulse/postal-services-market-size-trends-growth-outlook-0vvef/>>

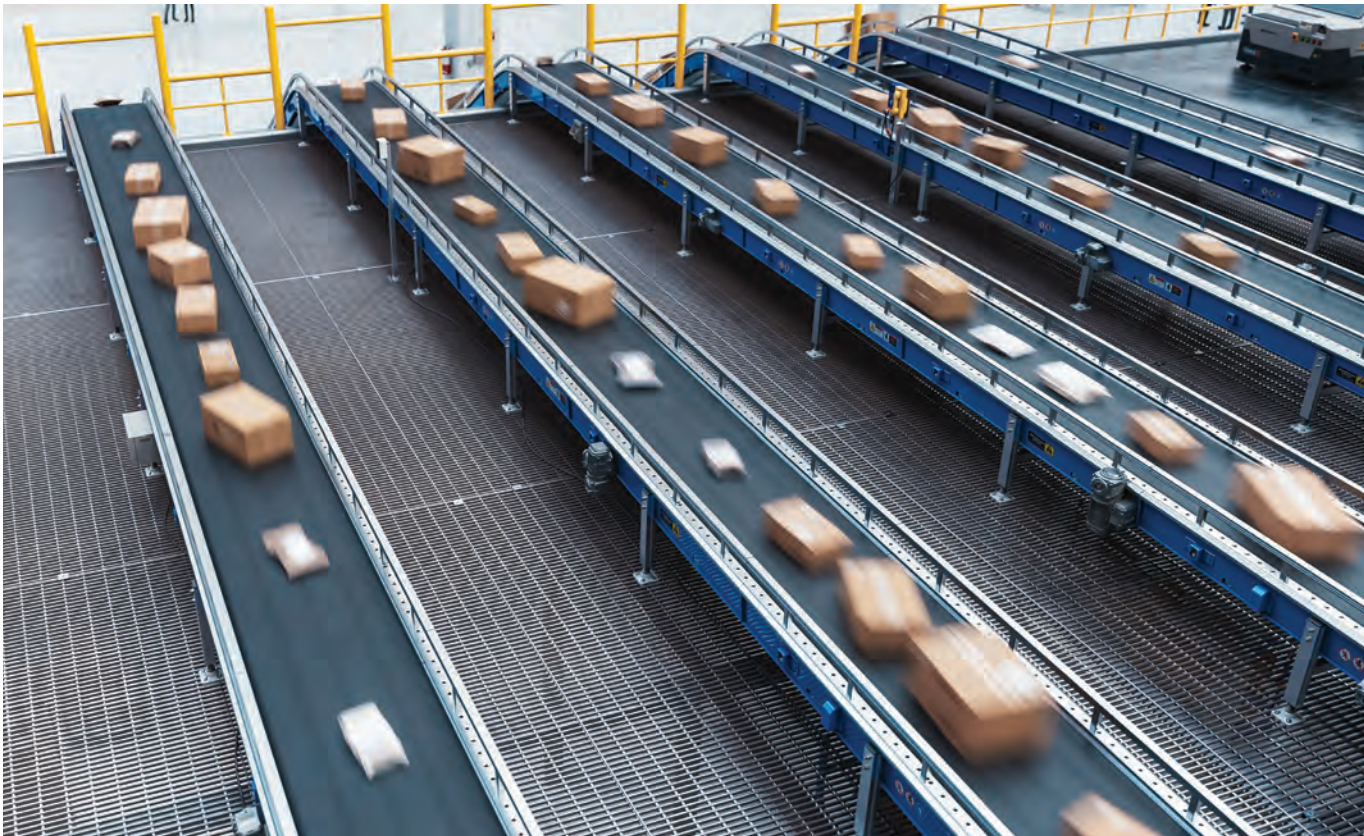
198. Sia Partners. (2023, October 17). The age of postal transformation: From managing the decline of existing businesses to rebooting and investing in growth opportunities. <<https://www.sia-partners.com/en/insights/publications/age-postal-transformation>>

199. Zion Market Research. (2025). Postal services market size, trends & growth outlook (2025–2034). LinkedIn. <<https://www.linkedin.com/pulse/postal-services-market-size-trends-growth-outlook-0vvef/>>

200. U.S. Postal Service Office of Inspector General. (2025, February 27). A comparative study of international postal models (Report No. RISC-WP-25-001). <<https://www.uspsaig.gov/sites/default/files/reports/2025-02/risc-wp-25-001.pdf>>

201. Staff. (2018, August 10). PostBank Kenya rolls out mobile banking platform. PYMNTS. <<https://www.pymnts.com/news/banking/2018/postbank-kenya-mobile-banking-digital-payments-international/>>

202. Stamp Free. (2025, April). The post and parcel trends report 2025. <<https://www.stampfree.ai/wp-content/uploads/2025/04/The-Post-and-Parcel-Trends-Report-2025.pdf>>



Courier:  
Expansion and  
Innovation

As the Postal sector expands its foundational infrastructure for e-commerce, it creates new opportunities for the Courier sector. This sub-sector, which includes express, parcel, and private logistics services, is also undergoing significant global expansion. This growth is being driven by rising e-commerce volumes, heightened consumer demand for speed and flexibility, and the need for alternative delivery options.

To meet these demands, e-retailers and delivery providers are increasingly adopting cost-effective last-mile solutions, such as the expanded use of Pick-Up Drop-Off (PUDO) points and parcel lockers. A denser network of shared parcel lockers helps to manage last-mile delivery costs while providing consumers with convenient and flexible pickup options.<sup>203</sup>

In parallel, AI-supported tools, including advanced route optimisation and proof-of-delivery systems, are being rolled out to streamline last-mile operations. Sustainability is also a core focus, particularly in fleet operations. The shift towards electric vehicles in the last mile is expected to accelerate, with some operators, like Swiss Post, even exploring innovative ways to extend the lifecycle of EV components by reusing old batteries for energy storage. As a result, courier firms are making substantial investments in network expansion, last-mile technologies, and alternative logistics channels.

In summary, the sector is navigating a period of rapid change, characterised by the decline of traditional mail and the explosive growth of parcel and e-commerce logistics. Both postal and courier operators are responding by embracing digital transformation, diversifying their services, and investing in sustainable and efficient last-mile delivery solutions. To fully leverage these new technologies, the sector must also prioritise workforce development, upskilling employees in areas such as AI and data analytics to support the transition from legacy systems and ensure long-term operational competitiveness.

203. Lloyd, L. (2024, November 21). Opinion: Exploring trends for 2025. Parcel & Postal Technology International. <<https://www.parcelandpostaltechnologyinternational.com/opinion/opinion-exploring-trends-for-2025.html>>

# Overview of Malaysian Trends in the Postal and Courier Sector

Malaysia's Postal and Courier sector is mirroring global trends, experiencing a significant shift from traditional postal services towards a parcel-centric, e-commerce-driven logistics ecosystem. The sector is regulated under the Postal Services Act 2012 (PSA 2012) and overseen by the Malaysian Communications and Multimedia Commission (MCMC), which ensures that all citizens have access to efficient, affordable, and high-quality postal services.

This sector includes a range of activities, from the collection and transport of letters to local delivery and messenger services. The process is segmented into distinct phases:

Segments

• First Mile

The initial phase of the delivery process, where mail and parcels are collected, aggregated, and prepared for transport from the point of origin to a distribution center, hub, depot, or warehouse.

• Middle Mile

The intermediate stage involving sorting, processing, and transporting parcels to a distribution centre closer to their final destination.

• Last Mile

The final leg of the journey, from the nearest transportation hub or sorting facility to the recipient's address.

• Data and Digital Solution

The technological backbone that covers software development, parcel tracking, route optimisation, and cross-border data management to improve efficiency, transparency, and customer experience.

• Support

Cross-functional services, including regulatory compliance and operational support, ensure smooth execution and service quality from the first to the last mile.

The sector is undergoing rapid growth, valued at RM6.58 billion (USD1.40 billion) in 2025 and is forecast to reach RM10.25 billion (USD2.18 billion) by 2030, representing a **9.24% CAGR**.<sup>204</sup>

Sector Size and Labour Profile<sup>205</sup>

Parcels per capita (2024)  
**37.2**

Number of Licensees

**Single**  
Universal Service Licensee  
(Pos Malaysia Berhad)  
**101**  
Non-universal Service Licensees

Number of Employees

**16,261** Postal  
**121,580** Courier

204. Mordor Intelligence Inc.. (n.d.). Malaysia Courier, Express, and Parcel (CEP) Market. <<https://www.mordorintelligence.com/industry-reports/malaysia-courier-express-and-parcel-cep-market>>

205. Malaysian Communications and Multimedia Commission (MCMC). (2025). P-C4Q-2024 BI [Quarterly statistics]. <[https://www.mcmc.gov.my/skmmgovmy/media/General/Resources/Statistics/2025/P-C-4Q-2024\\_BI.pdf](https://www.mcmc.gov.my/skmmgovmy/media/General/Resources/Statistics/2025/P-C-4Q-2024_BI.pdf)>



Mirroring global trends, Malaysia’s Postal and Courier sector is experiencing a decline in traditional letter mail, a shift driven by changing consumer expectations, digitisation, and an increased demand for faster, more efficient parcel delivery. This marks a transition from legacy postal operations to a dynamic, e-commerce-driven logistics ecosystem. To support this momentum, operators are expanding infrastructure networks, including road systems and PUDO points, and investing in greener fleets to improve capacity and sustainability.<sup>206</sup>

Nonetheless, despite growth fuelled by digitisation and innovation, the sector faces key challenges. Last-mile efficiency is hampered by limited accessibility in certain rural areas; for instance, villagers without postcodes often must travel to collection points to receive mail and parcels, impacting overall efficiency, even with the assistance of post agents in some regions. Furthermore, high operational costs are a concern, as fluctuations in global fuel prices increase logistics operating expenses, potentially leading to higher delivery fees and reduced affordability for businesses and consumers alike.<sup>207</sup>

Ultimately, the sector’s future success hinges on its ability to fully transition into a parcel-centric, technology-enabled delivery ecosystem, where the adoption of AI and digital technologies will be crucial for maintaining competitiveness and ensuring reliable coverage across both urban and rural areas.

### Alignment to National Agenda

Malaysia’s Postal and Courier sector is evolving rapidly to meet surging e-commerce demands. In support of this role, MCMC launched the Pelan Accelerator Kurier Negara (PAKEJ) under the Twelfth Malaysia Plan (RMKe-12).<sup>208</sup> The PAKEJ blueprint, which aligns with national initiatives such as MyDIGITAL and National E-Commerce Strategic Roadmap 2.0 (NESR 2.0), is guided by four (4) pillars: Reliability, Reach, Relevance, and Resilience (4R). Its key goals includes:



- Enhancing service reliability and empowering micro, small, and medium-sized enterprises (MSMEs) to participate in the digital economy
- Expanding the parcel point network, with a target of adding 4,000 new PUDO locations annually to reach 30,000 by 2025
- Promoting transparency through quality of service (QoS) disclosures, courier network mapping, and integration with the National Address System

PAKEJ’s roadmap is driving reforms such as infrastructure sharing, PUDO expansion, streamlined licensing, and unified service standards, which are foundational to a more integrated and future-ready delivery system. The PAKEJ Roadmap is strategically aligned with the National Postal and Courier Industry Lab’s (NPCIL) True North, which is defined by the following two (2) key goals:

- **Seamless Coverage and Quality:** To ensure all Malaysians have access to high-quality courier services.
- **Sustainable eCommerce Support:** To sustainably support the projected, massive growth of the eCommerce industry.

206. Malaysian Communications and Multimedia Commission. (2021, June 17). Pelan Accelerator Kurier Negara (PAKEJ): Five-year strategic roadmap for courier services. <<https://www.mcmc.gov.my/en/initiatives/pelan-accelerator-kurier-negara-pakej>>  
207. Malaysian Communications and Multimedia Commission. (2021, June 17). MCMC announces five-year roadmap PAKEJ for courier services. <<https://www.komunikasi.gov.my/en/public/news/19207-mcmc-announces-five-year-roadmap-pakej-for-courier-services>>  
208. Ibid

### Opportunities and Challenges

Despite the robust growth fuelled by digitalisation and strategic reforms, the sector faces several key challenges that threaten to impede its full transition into a modern, parcel-centric ecosystem. These obstacles stem from a combination of economic pressures, logistical complexities, and a persistent digital and talent divide across the sector. At the same time, rapid e-commerce expansion, advancements in automation, and rising demands of green logistics create significant opportunities. The sector’s future is promising, and to realise its full potential, the sector must overcome a number of persistent challenges while strategically capitalising on these growth avenues.

Opportunities

- New Developments and Growth Opportunities**  
The surge in e-commerce and digital platforms is significantly boosting demand for parcel volumes, fuelling expansion and innovation in courier services.<sup>209</sup> This is supported by national policies like the PAKEJ Blueprint and NESR 2.0 which aim to empower MSMEs and improve delivery reliability. The sector is also embracing sustainability, with a growing focus on electric vehicles, biodegradable packaging, and carbon tracking to meet ESG targets.
- Advanced Technologies to Enhance Sector Performance**  
The adoption of advanced technologies is improving operational efficiency and customer experience.<sup>210</sup> AI and data analytics are crucial for smarter route optimisation and real-time decision-making. Cloud infrastructure provides seamless parcel tracking, while automation and robotics are increasing throughput at distribution hubs. Furthermore, IoT devices and drones are expanding last-mile delivery to rural and remote areas, enhancing service inclusivity.<sup>211</sup>
- Capacity Development and Talent Upskilling**  
As the sector embraces digital transformation, there is a clear opportunity to equip the workforce with skills in automation, green technologies, and digital service delivery. This will help address a growing talent shortage and create a more resilient and competitive workforce, with new roles emerging in AI, IoT, electric mobility, and cybersecurity.<sup>212,213,214</sup>

209. Ministry of Communications and Digital (Malaysia). (2021, June 17). MCMC announces five-year roadmap PAKEJ for courier services. <<https://www.komunikasi.gov.my/en/public/news/19207-mcmc-announces-five-year-roadmap-pakej-for-courier-services>>  
210. 6Wresearch. (n.d.). Malaysia warehouse robotics market [Industry report]. <<https://www.6wresearch.com/industry-report/malaysia-warehouse-robotics-market>>  
211. CXP Asia. (2024, October 23). Pos Malaysia’s digital transformation boosts operational efficiency and customer experience. <<https://cxp.asia/2024/10/23/pos-malaysias-digital-transformation-boosts-operational-efficiency-and-customer-experience>>  
212. The Edge Malaysia. (2024, August 29). Pos Malaysia posts highest quarterly profit since 2017 on strong parcel business. <<https://theedgemalaysia.com/node/731828>>  
213. The Malaysian Reserve. (2023, March 13). Pos Malaysia unveils sustainability roadmap. <<https://themalaysianreserve.com/2023/03/13/pos-malaysia-unveils-sustainability-roadmap>>  
214. Accenture. (2022). A roadmap to sustainability for Malaysia’s national postal service. <<https://www.accenture.com/content/dam/accenture/final/industry/public-service/document/Accenture-A-Roadmap-To-Sustainability-For-Malaysia-National-Postal-Service.pdf>>

Challenges

- Scaling Growth Amid Fragmented Networks and Cost Pressures**  
Operators face the dual challenge of fragmented networks and high operational costs. Last-mile delivery is inefficient in rural areas with limited infrastructure, and fluctuating fuel prices put significant pressure on profit margins. Smaller companies often struggle to invest in advanced technologies like electric vehicles (EVs) due to limited financial resources.<sup>215</sup>
- Bridging the Tech Divide and Overcoming Integration Barriers**  
A major obstacle is the digital maturity gap within the sector.<sup>216</sup> Many small and medium-sized courier operators rely on outdated legacy systems, which prevents the smooth adoption of modern solutions like real-time tracking and optimisation tools. This tech divide also leads to urban-rural disparities in system interoperability, reducing overall delivery reliability.
- Closing the Skills Gap to Build a Future-Ready Workforce**  
There is a growing shortage of skilled talents in critical areas such as AI, cybersecurity, and automation.<sup>217</sup> This is particularly pronounced in smaller companies that lack access to structured training or upskilling programmes. This talent gap hinders the sector's ability to fully adopt and scale new technologies, posing a significant risk to Malaysia's modernisation efforts.

In summary, amid a decline in traditional mail, Malaysia's Postal and Courier sector is being transformed by the rise of e-commerce. Its future success depends on its ability to embrace a parcel-centric, technology-enabled ecosystem, with continued support from national policies and a focus on overcoming operational and skill-related challenges.

The integration of AI, Digital, and Green Economy principles into the Postal and Courier sector is essential to help the industry respond to the rapid growth of e-commerce, improve efficiency, and meet evolving sustainability expectations.

Globally, the push for digitalisation has been evident for over a decade, with leading postal operators investing heavily in technologies like the IoT and advanced tracking to digitise the supply chain, moving beyond traditional methods that can no longer cope with the modern volume, speed, and complexity of parcel delivery. Yet, in Malaysia, many players are still lagging, necessitating full-scale digital adoption to reduce errors and provide the seamless service modern consumers demand.

Building on this, the adoption of AI is essential for unlocking the next level of operational efficiency. AI has been a global trend for years, powering predictive analytics for functions such as automated route optimisation, which cuts both fuel costs and delivery times. For Malaysia, AI is crucial for tackling endemic issues like last-mile inefficiencies by processing complex geographical data to intelligently determine the best placement for infrastructure like PUDO points and establish dynamic routing, thereby ensuring reliable and affordable coverage across diverse urban and remote rural communities alike.

Finally, the shift towards a Green Economy is a global mandate. This trend has seen operators worldwide focus on sustainability, including fleet electrification and the implementation of efficient reverse logistics systems. This transition is vital for Malaysia to achieve its national climate commitments, involving the replacement of high-emission fleets with greener options and using digital tools to minimise mileage. Crucially, improved waste management, facilitated by digital tracking and streamlined reverse logistics for packaging, directly contributes to a significant reduction in carbon emissions and promotes a cleaner city environment.

215. Verified Market Research. (n.d.). Malaysia courier, express, and parcel (CEP) market. <<https://www.verifiedmarketresearch.com/product/malaysia-courier-express-and-parcel-cep-market>>

216. MCMC. (2024). Industry performance report 2023. <<https://www.mcmc.gov.my/skmmgovmy/media/General/Report/MCMC-Industry-Performance-Report-2023.pdf>>

217. The Edge Malaysia. (2024, August 29). Pos Malaysia posts highest quarterly profit since 2017 on strong parcel business. <<https://theedgemalaysia.com/node/731828>>

# Impact and Adoption of AI, Digital, and Green Economy on the Postal and Courier Sector

The Malaysian Postal and Courier sector is at a pivotal moment, being profoundly reshaped by the intersecting forces of AI, Digital, and the Green Economy. This confluence of technological and environmental imperatives is fundamentally altering business models, requiring operators to strategically re-evaluate their entire value chain, evolve their workforce, and integrate sustainable practices into their core operations. For Malaysia, this presents a unique opportunity to strengthen the sector's long-term resilience and drive sustainable growth, aligning with key national strategies such as PAKEJ and the New Industrial Master Plan 2030 (NIMP 2030).

## A Artificial Intelligence

AI and machine learning (ML) are revolutionising the sector by providing predictive capabilities and enabling automation. These technologies allow operators to analyse large datasets to forecast demand, optimise complex delivery networks, and enhance service reliability. While global postal and courier giants are accelerating AI adoption at scale, Malaysia is advancing with purposeful pilots and strategic partnerships, focusing on long-term, sustainable integration.

### Global Trends

The global Postal and Courier sector is deploying AI across multiple key functions:

- 1. Robotics in Parcel Sorting and Delivery**
  - AI-powered robotic systems are increasingly used in warehouses to efficiently sort parcels, reducing the need for manual labour. Autonomous mobile robots (AMRs) are a major part of this trend.<sup>218</sup>
- 2. AI-Enabled Route Optimisation**
  - AI and big data enable dynamic routing and traffic-aware delivery scheduling. This is a crucial application, as it significantly reduces last-mile delivery costs while improving efficiency and customer satisfaction.<sup>219</sup>
- 3. Autonomous Last-Mile Delivery**
  - Autonomous last-mile delivery is rapidly expanding worldwide. This is driven by AI advancements, rising consumer demand for faster and contactless deliveries, and the increasing adoption of drones and robots in logistics.<sup>220</sup> AI-powered drone delivery, for example, automates the last mile for faster, more efficient, and eco-friendly service by enabling drones to autonomously navigate and coordinate as a fleet.<sup>221</sup>

218. Transport Intelligence. (2024, June 11). AI and robotics: Revolutionizing parcel sorting and delivery operations. <<https://ti-insight.com/briefs/ai-and-robotics-revolutionizing-parcel-sorting-and-delivery-operations>>

219. AI Expert Network. (2024, March 14). Case study: AI-powered logistics at FedEx. <<https://aiexpert.network/case-study-ai-powered-logistics-at-fedex>>

220. Market Scoop by Market.us. (2024, August 5). Autonomous last-mile delivery market news and insights. <<https://scoop.market.us/autonomous-last-mile-delivery-market-news>>

221. Hawkins, A. J. (2024, July 30). The drone-delivery service beating Amazon to your front door. The Wall Street Journal. <<https://www.wsj.com/tech/the-drone-delivery-service-beating-amazon-to-your-front-door-1ad898b4>>



4. GenAI for Smarter Support

- GenAI is being used to support real-time interactions, enhance delivery tracking updates, and provide more accurate case resolution. Tools such as Large Language Models (LLMs) and Retrieval-Augmented Generation (RAG) automate and improve communication, making complex data journeys easy for users to understand.<sup>222</sup>

5. AI-Driven Parcel Track and Trace

- AI tools improve communication by providing accurate, easy-to-understand information to users, enhancing task efficiency and analysing complex data journeys.<sup>223</sup>



Global Case Studies

Leading global players are demonstrating the transformative power of AI through strategic deployments:



**DHL** partnered with Locus Robotics to deploy AI-driven autonomous robots, enhancing parcel delivery efficiency by improving productivity and reducing labour demands in its warehouses.<sup>224</sup>



**Amazon** has deployed over 750,000 robots, using systems like Sequoia and robotic arms, to automate parcel sorting, inventory handling, and packaging in its fulfilment centres.<sup>225</sup>



**FedEx** is leveraging AI through its Dataworks platform to analyse large datasets, optimise delivery routes, improve Estimated Time of Arrival (ETA) accuracy, and reduce last-mile costs. FedEx also partnered with QuikBot to deploy autonomous delivery robots in Singapore, enhancing last-mile logistics in commercial buildings.<sup>226</sup>



**United States Postal Services (USPS)** plans to leverage GenAI to streamline customer service, parcel tracking, and internal operations.<sup>227</sup>



**PostNL** developed an in-house GenAI system, SuperTracy, which autonomously tracks parcels, detects logistical issues, and improves customer communication regarding delivery status.<sup>228</sup>

Malaysian Trends

While global postal and courier giants are accelerating AI adoption at scale, Malaysia is advancing with a low, but growing, state of adoption, focusing on purposeful pilots and strategic partnerships. The Malaysian government is actively encouraging the sector to leverage AI to enhance productivity and service quality. Meanwhile, amid surging e-commerce volumes, Malaysia’s leading private courier companies and the national postal service have initiated AI-driven transformations to enhance operational efficiency and service quality. These efforts demonstrate a strategic shift towards embedding AI across core operations to streamline deliveries and improve customer experience.

1. AI-Powered Operations in Delivery Logistics

- **Pos Malaysia** is exploring machine learning to forecast parcel demand and optimise its delivery fleet and routes, aiming to improve efficiency and reduce costs.<sup>229</sup>
- **AirAsia's logistics arm, Teleport**, incorporates "intelligence for automated yet flexible planning" to streamline operations from the first to the last mile across its network.<sup>230</sup>
- **Ninja Van** uses AI-driven route optimisation that considers factors such as distance, traffic, and schedules to assign the most efficient routes to drivers, thereby improving delivery times and reducing fuel consumption.<sup>231</sup>
- **J&T Express's** proprietary platform leverages AI to parse and correct address data, which significantly improves parcel sorting accuracy and reduces misdeliveries.<sup>232</sup>

2. Automation in Warehousing and Customer Service

- AI is also transforming warehousing and customer engagement within Malaysia. For example, Ninja Van’s fulfilment centres use AI-guided robots for automated picking, which minimises human error and speeds up parcel processing.<sup>233</sup>

222. The U.S. Sun. (2024, May 10). USPS to implement major changes using artificial intelligence. <<https://www.the-sun.com/news/13842353/usps-major-changes-artificial-intelligence>>

223. Zhou, J., & Nguyen, K. (2024). AI-enabled logistics optimization for last-mile delivery [Preprint]. arXiv. <<https://arxiv.org/abs/2409.02711>>

224. DHL Supply Chain. (2024, March 26). DHL Supply Chain continues to innovate with orchestration, robotics, and AI in 2024 <<https://www.dhl.com/us-en/home/press/press-archive/2024/dhl-supply-chain-continues-to-innovate-with-orchestration-robotics-and-ai-in-2024.html>>

225. Amazon. (2024, February 19). Inside Amazon Robotics: How robots support associates in fulfillment centers. <<https://www.aboutamazon.com/news/operations/amazon-robotics-robots-fulfillment-center>>

226. AI Expert Network. (2024, March 14). Case study: AI-powered logistics at FedEx. <<https://aiexpert.network/case-study-ai-powered-logistics-at-fedex>>

227. The U.S. Sun. (2024, May 10). USPS to implement major changes using artificial intelligence. <<https://www.the-sun.com/news/13842353/usps-major-changes-artificial-intelligence>>

228. Zhou, J., & Nguyen, K. (2024). AI-enabled logistics optimization for last-mile delivery [Preprint]. arXiv. <<https://arxiv.org/abs/2409.02711>>

229. Parcel and Postal Technology International. (2024, October 22). Exclusive interview: Pos Malaysia's digital transformation journey. <<https://www.parcelandpostaltechnologyinternational.com/features/exclusive-interview-pos-malaysia.html>>

230. The STAT Trade Times. (2024, August 14). Teleport to deliver two million parcels daily by 2025, says company CEO. <<https://www.stattimes.com/air-cargo/teleport-to-deliver-two-million-parcels-daily-by-2025-says-company-ceo-1352104>>

231. Ninja Van Blog. (2024, March 29). AI in logistics: How Ninja Van optimizes delivery routes and customer experience. <<https://blog.ninjava.co/en-ph/ai-in-logistics>>

232. J&T Express Vietnam. (2024, May 8). J&T Express: Revolutionising last-mile delivery. LinkedIn. <<https://www.linkedin.com/pulse/jt-express-revolutionising-last-mile-delivery-jntexpressvietnam-vgffc>>

233. Ninja Van Blog. (2024, March 29). AI in logistics: How Ninja Van optimizes delivery routes and customer experience. <<https://blog.ninjava.co/en-ph/ai-in-logistics>>

3. Strategic Collaborations and MoUs

- Several notable Memorandums of Understanding (MoUs) have been signed by private courier and logistics companies in Malaysia since 2024, highlighting a growing commitment to collaborative innovation and AI readiness.
- **Ninja Van and Esyms:** They have partnered to enhance the AI-powered cold-chain delivery of medication for Allmeds, enabling reliable temperature-sensitive logistics in Malaysia.<sup>233</sup>
- **Pos Malaysia, Primary Guard, and JumpCloud:** This partnership aims to modernise IT infrastructure and boost AI readiness through improved system visibility and compliance.<sup>234</sup>



Malaysian Case Studies

These collaborations and pilot projects showcase how AI is being applied to solve specific, local challenges:



J&T Express:

The company's use of AI to correct address data demonstrates a direct application of machine learning to improve a critical pain point in parcel logistics. By reducing sorting errors, it enhances the overall customer experience.<sup>236</sup>



Pos Malaysia

Their partnerships, such as the one with Primary Guard and JumpCloud, are a clear indication of a strategic effort to build a robust technological foundation. This infrastructure is essential for leveraging more complex AI applications, such as predictive analytics and customer service automation in the future.<sup>237</sup>



Ninja Van

The use of both AI-driven route optimisation and AI-guided robots in its fulfilment centres highlights a comprehensive approach to integrating AI across the entire value chain, from last-mile delivery to warehouse operations.<sup>238</sup>

B

Digital

Digital transformation is reshaping the global postal and courier landscape, with Malaysia making notable progress through extensive automation efforts. The sector is moving beyond traditional, paper-based operations towards an interconnected digital ecosystem.

Global Trends

Across the globe, major postal and courier companies are leveraging digital technologies to enhance efficiency, customer experience, and operational resilience.

1. Cloud-Based Delivery Platforms

- Companies are replacing legacy on-site systems with flexible, cloud-based platforms. This cloud-first approach streamlines system maintenance, supports remote teams, and provides the scalability needed to manage massive parcel volumes during peak periods, mitigating infrastructure risks.<sup>239</sup>

2. IoT for Smart Logistics

- IoT sensors embedded in parcels, vehicles, and infrastructure provide real-time monitoring of shipments. This enhances overall delivery efficiency by providing visibility on factors such as location, temperature, and humidity for sensitive items, thereby improving traceability and control throughout the supply chain.<sup>240</sup>

3. Robotic Process Automation (RPA)

- RPA tools are increasingly used to automate repetitive, rule-based administrative tasks, such as data entry from customer and supplier forms. This boosts accuracy, reduces manual effort, and improves the speed and quality of back-office processes.<sup>241</sup>

4. Unified Digital Platforms

- Operators are adopting unified digital platforms that enable customers to seamlessly track shipments, make payments, and interact with customer service.<sup>242</sup> Mobile apps are a key component of this trend, providing end-to-end visibility of the delivery process and empowering customers with control over their deliveries.<sup>243</sup>



Global Case Studies

Leading international examples illustrate the benefits of digital transformation:



**Australia Post** has adopted cloud computing to enhance parcel tracking and customer engagement, enabling scalable services during high-demand periods.<sup>244</sup>

234. Disruptr Malaysia. (2024, April 2). Ninja Van Malaysia and eSyms collaborate to ensure swift, secure medication deliveries. <<https://www.disruptr.com.my/ninja-van-malaysia-and-esyms-collaborate-to-ensure-swift-secure-medication-deliveries>>

235. Digital News Asia. (2024, September 9). Primary Guard, JumpCloud, and Pos Malaysia collaborate to accelerate digital transformation. <<https://www.digitalnewsasia.com/business/primary-guard-jumpcloud-and-pos-malaysia-collaborate-accelerate-digital-transformation>>

236. J&T Express Vietnam. (2024, May 8). J&T Express: Revolutionising last-mile delivery. LinkedIn. <<https://www.linkedin.com/pulse/jt-express-revolutionising-last-mile-delivery-jntexpressvietnam-vgffc>>

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238. Ninja Van Blog. (2024, March 29). AI in logistics: How Ninja Van optimizes delivery routes and customer experience. <<https://blog.ninjava.co/en-ph/ai-in-logistics>>

239. PostEurop. (2024, October). PostEurop innovation booklet 2024. <<https://www.posteurop.org/wp-content/uploads/2024/10/2024-PostEurop-Innovation-Booklet.pdf>>

240. DHL. (2024). DHL SmartSensor: Innovation in logistics. <<https://www.dhl.com/us-en/home/innovation-in-logistics/innovation-in-action/dhl-smartsensor.html>>

241. UiPath. (2023). Royal Mail Group: Postal service RPA case study. <<https://www.uipath.com/resources/automation-case-studies/royal-mail-group-postal-service-rpa>>

242. Micklethwait, J. (2024, July 5). New technology is taking package tracking past scanning. The Wall Street Journal. <<https://www.wsj.com/articles/new-technology-is-taking-package-tracking-past-scanning-3c9a3cf1>>

243. Consumer Products World. (2025, January 10). Parcello launches predictive shipment-tracking app for iOS and Android in the USA in Q1 2025. <<https://www.consumerproductsworld.com/article/730681907-parcello-launches-predictive-shipment-tracking-app-for-ios-and-android-in-the-usa-in-q1-2025>>

244. Australia Post. (2024). Australia Post annual report 2024. <[https://auspost.com.au/content/dam/auspost\\_corp/media/documents/2024-australia-post-annual-report.pdf](https://auspost.com.au/content/dam/auspost_corp/media/documents/2024-australia-post-annual-report.pdf)>





**DHL's SmartSensor** leverages IoT to provide real-time monitoring of sensitive shipments, enhancing visibility and control throughout the supply chain.<sup>245</sup>



**Royal Mail** has implemented RPA in its back-office and administrative functions, achieving significant cost savings and improved turnaround times.<sup>246</sup>



**Aramex Mobile** offers a comprehensive app that provides real-time parcel tracking, delivery scheduling, and waybill creation, serving as a best practice for a unified customer platform.<sup>247</sup>

Malaysian Trends

Malaysia's Postal and Courier sector is accelerating its digital transformation to meet the demands of a rapidly growing e-commerce market. With a medium state of adoption, local operators are strategically investing in key digital technologies.

1. Cloud Infrastructure

- Malaysia's Postal and Courier sector is rapidly adopting digitalisation to cope with the e-commerce surge and national delivery demands. The shift to a scalable cloud infrastructure is a foundational step, enabling the sector to implement advanced technologies like AI for predictive analytics and streamlined systems such as "Address-as-a-Service." This digital transition is critical for delivering the reliable, high-quality service required in Malaysia's diverse geographical landscape.

2. IoT and Automation

- The sector is embracing the IoT and automation as critical trends to combat surging e-commerce volumes and increase capacity. Investment in technologies such as IoT sensors, high-speed automated sorting systems, and advanced load optimisation tools is necessary to increase throughput and ensure greater operational predictability. This push for automation is essential for meeting the consumer expectation of rapid delivery across the country.

3. RPA:

- RPA is a key trend in Malaysia for enhancing efficiency by automating repetitive administrative tasks in both front-end and back-end operations. This technology is vital for speeding up and improving the accuracy of complex processes, such as customs clearance and cargo handling, which ultimately reduces the time-consuming manual intervention and allows staff to focus on strategic customer functions.

245. DHL. (2024). DHL SmartSensor: Innovation in logistics. <<https://www.dhl.com/us-en/home/innovation-in-logistics/innovation-in-action/dhl-smartsensor.html>>  
246. UiPath. (2023). Royal Mail Group: Postal service RPA case study. <<https://www.uipath.com/resources/automation-case-studies/royal-mail-group-postal-service-rpa>>  
247. Gulf Time. (2024, April 4). Aramex launches new smart app to manage shipments. <<https://gulftime.ae/aramex-launches-new-smart-app-to-manage-shipments>>

4. Mobile Applications:

- The widespread adoption of mobile applications is a crucial trend, empowering the Malaysian consumer with real-time control and self-service capabilities. Integrated with cloud systems, these applications streamline processes, offering features from instant parcel tracking and bill payment to generating e-waybills and providing accurate ETA updates. This digital interface is essential for automating routine tasks and dramatically elevating the customer experience.



Malaysian Case Studies

The digital transformation in Malaysia is best illustrated by the strategic investments of key players:



Pos Malaysia's Cloud Migration

Pos Malaysia is leading this trend by migrating over 65% of its core applications to AWS Cloud. This transformation successfully cut IT costs by half and eliminated downtime, proving the immediate financial and operational value of cloud adoption. The inherent cloud scalability enabled the rapid deployment of features like the ETA parcel tracking in just six (6) weeks. Furthermore, the firm is modernising its entire data strategy, shifting to real-time, cloud-based analytics for superior route optimisation and efficiency, necessitating a company-wide upskilling in data science expertise.<sup>248</sup>



Ninja Van and J&T:

Ninja Van Malaysia exemplifies this trend, having commissioned a new automated parcel hub in Selangor in 2023. Equipped with digital scanners and conveyor belts, the facility can process up to 30,000 parcels per hour, boosting its overall capacity by 35%. This move is mirrored by J&T Express, which has similarly integrated automated sorting systems across its key facilities to enhance efficiency.<sup>249,250</sup>



Pos Aviation

Pos Malaysia has successfully integrated RPA into its operations, particularly through its subsidiary Pos Aviation, which utilises RPA to automate repetitive tasks in cargo handling at KLIA. Additionally, Pos Malaysia has introduced an omnichannel chatbot enabling customers to self-serve their customs clearance processes, allowing for digital payment of fees and taxes, which significantly reduces processing time.<sup>251,252</sup>

248. Amazon Web Services (AWS). (2024). Pos Malaysia accelerates digital transformation using AWS Cloud [Case study]. <<https://aws.amazon.com/solutions/case-studies/pos-malaysia>>  
249. Malaysian Investment Development Authority (MIDA). (2024, February 15). Ninja Van Malaysia thriving on the wave of e-commerce. <<https://www.mida.gov.my/ninja-van-malaysia-thriving-on-the-wave-of-e-commerce>>  
250. J&T Express Holdings Ltd. (2025, March 5). Annual results announcement 2024 [Financial report]. <[https://ir.jtexpress.com/media/1s0b350m/hkex-eps\\_20250305\\_11557918\\_0.pdf](https://ir.jtexpress.com/media/1s0b350m/hkex-eps_20250305_11557918_0.pdf)>  
251. TM One. (2024, May 15). Pos Malaysia redefining business with digital strategies and partnerships. <<https://www.tmone.com.my/think-tank/pos-malaysia-redefining-business-with-digital-strategies-and-partnership>>  
252. BERNAMA. (2022, July 22). Pos Malaysia launches Smart Locker initiative to enhance parcel services. <<https://www.bernama.com/en/news.php?id=2121979>>



Mobile Apps Implementation

Pos Malaysia’s app offers a comprehensive range of services, including parcel tracking, bill payment, ETA updates, and e-consignment tools, all seamlessly integrated with its cloud systems. Similarly, the J&T Express app enables customers to access tracking, fee estimates, and e-waybills, effectively automating customer notifications and the entire onboarding process.<sup>253,254</sup>

This medium state of adoption shows that while Malaysia is not yet at the same level of digital maturity as some global markets, it is taking decisive steps to modernise its infrastructure and services, with major players leading the way.

C Green Economy

Sustainability is becoming a fundamental part of the Postal and Courier sector's business model, driven by growing environmental awareness, consumer demand, and regulatory pressure. The transition to a Green Economy is advancing through the electrification of fleets, the adoption of circular packaging, and the use of carbon-tracking technologies.

Global Trends

International operators are leading the charge in embedding sustainability into their core operations.

1. Electrification of Delivery Fleets

- Postal and courier services worldwide are rapidly transitioning to EV to reduce carbon emissions and meet environmental regulations. This shift covers both last-mile delivery fleets and longer-distance transport, supported by the development of dedicated EV charging infrastructure.<sup>255</sup>

2. Circular Packaging and Reverse Logistics

- Companies are accelerating the move toward biodegradable, recyclable, and reusable packaging to minimise waste. To support net-zero goals, they are also implementing reverse logistics systems to recover used materials, promoting a circular economy across the value chain.<sup>256</sup>

3. Carbon-Neutral Services

- As consumer demand for eco-friendly options grows, providers are offering climate-friendly shipping services. Many now provide tools to track and report emissions reductions, often backed by verified carbon offsets.<sup>257</sup>

4. Renewable Energy Adoption

- Leading companies are investing in renewable energy sources, such as solar and wind power, to reduce their operational carbon footprint and contribute to corporate climate commitments.<sup>258</sup>

253. Pos Malaysia Berhad. (n.d.). Pos Malaysia Mobile. <<https://play.google.com/store/apps/details?hl=en-US&id=my.com.pos.posmobile.posmobileapps&pli=1>>  
254. J&T Express Malaysia. (n.d.). J&T Express Malaysia App. <<https://play.google.com/store/apps/details?id=com.jtexpress.MyClient&hl=en>>  
255. Tuminello, M. (2024, May 7). Amazon plans to deploy a dozen electric seaport trucks amid push to slash tailpipe emissions. New York Post. <<https://nypost.com/2024/05/07/business/amazon-plans-to-deploy-a-dozen-electric-seaport-trucks-amid-push-to-slash-tailpipe-emissions>>  
256. DHL. (2024). Sustainability trends in logistics. <<https://www.dhl.com/discover/en-us/global-logistics-advice/sustainability-and-green-logistics/sustainability-trends-in-logistics>>  
257. Universal Postal Union (UPU). (2024). Climate action. <<https://www.upu.int/en/universal-postal-union/activities/sustainable-development/climate-action>>  
258. Placement for Citation



Global Case Studies

Leading international examples illustrate the benefits of digital transformation:



**Swiss Post** operates over 7,300 EVs, which are powered by green electricity. This initiative aims to significantly reduce emissions, advancing the company's goal of achieving climate-neutral operations by 2030.<sup>259</sup>



**The USPS** is targeting a reduction in greenhouse gas emissions by 2030 through a strategy that includes expanding its EV fleet, shifting more parcels to ground transport, reducing waste, and optimising delivery routes.<sup>260</sup>



**PostNL** has successfully deployed reverse logistics systems to efficiently collect and reuse packaging, thereby cutting waste and driving circular economy goals within sustainable last-mile delivery.<sup>261</sup>



**DHL** has adopted a sustainable packaging approach focused on optimising materials, reducing overall waste, and shifting towards circular solutions for both warehouse consumables and e-commerce packaging.<sup>262</sup>



**The UPU (Universal Postal Union)** Sustainability Measurement & Management System (SMMS) allows postal operators globally to track and report emissions reductions. Many of these posts now offer "climate-friendly" shipping options backed by UPU-certified offsets.<sup>263</sup>

259. Swiss Post. (2024). Non-financial results: Environmental and social performance. In Swiss Post Annual Report 2024. <<https://geschaeftsbericht.post.ch/24/ar/en/non-financial-results>>  
260. Associated Press (AP News). (2024, January 30). Postal Service announces green environmental goals. <>  
261. PostNL. (2024). Environmental disclosures: Resource use and circular economy. In Annual report 2024. <<https://annualreport.postnl.nl/2024/performance-statements/sustainability-statement/environmental-disclosures/resource-use-and-circular-economy>>  
262. DHL. (2024). Sustainable packaging and circularity: How DHL advances circular economy principles [White paper]. <<https://www.dhl.com/content/dam/dhl/global/csi/documents/pdf/glo-csi-sustainable-packaging-and-circularity.pdf>>  
263. Universal Postal Union (UPU). (2024). Climate action. <<https://www.upu.int/en/universal-postal-union/activities/sustainable-development/climate-action>>





**SingPost** has invested in a large-scale solar power system at its SingPost Centre, utilising renewable energy for increased energy efficiency across its properties, with an overall goal of achieving net-zero emissions by 2030.<sup>264</sup>

Malaysian Trends

Malaysia's Postal and Courier sector is at a medium state of adoption for green practices, with key players actively embedding environmental considerations into their operations.

1. National Policy Alignment and Climate Commitments

- The Malaysian Postal and Courier sector is fundamentally restructuring its operations to align with national sustainability frameworks, particularly the Net Zero 2050 goal. This trend embeds climate responsibility into all strategic investments, from fleet and infrastructure upgrades to technology procurement. By formally linking corporate targets to national climate commitments, the sector is not only mitigating environmental risk but also establishing robust systems for transparent carbon-tracking and accounting, which is vital for building a green logistics ecosystem for all businesses.

2. Fleet Electrification

- A primary operational trend in Malaysia is fleet electrification, driven by the need to drastically reduce carbon emissions, particularly in high-frequency first- and last-mile delivery. Operators are progressively shifting away from traditional fossil fuels towards EVs. This transition is not only an environmental imperative but also a strategic move to hedge against fuel price volatility and to build a future-ready, cost-efficient delivery network for the entire country.

3. Renewable Energy Integration

- The integration of renewable energy is a significant trend as the Malaysian sector seeks to decarbonise its large operational footprint. This involves investing in solar infrastructure, predominantly through the installation of solar panels on facility rooftops, to generate clean power for energy-intensive logistics operations. This strategy reduces reliance on the electricity grid, lowers operating costs, and directly contributes to the sector's overall emission reduction targets.

4. Sustainable Packaging

- A crucial trend in addressing the environmental impact of e-commerce is the move towards sustainable packaging. Courier services in Malaysia are now focused on transitioning to materials that are either recyclable or biodegradable and implementing strategies to minimise overpackaging waste. This initiative is key to developing a circular economy model, reducing landfill reliance, and meeting growing consumer demand for greener supply chains.

264. Singapore Post Limited. (2024, April 18). SingPost completes rooftop solar panel installation – S\$11 billion SingPost Centre upgrade. <<https://www.singpost.com/about-us/news-releases/singpost-completes-rooftop-solar-panel-installation-s11-billion-singpost>>



Malaysian Case Studies



Pos Malaysia's Sustainability Roadmap

Pos Malaysia has published a comprehensive Sustainability Roadmap in line with national climate goals. A key initiative is the establishment of Pos Hijau, a pioneering carbon-tracking and accounting platform. This tool is specifically designed to help businesses of all sizes measure, report, and reduce their greenhouse gas (GHG) emissions, positioning the national post as a leader in corporate climate governance.<sup>265,266</sup>

EV Fleet Rollouts

Pos Malaysia is aggressively pursuing this trend, having already deployed 1,252 e-bikes and 264 electric vans, and targets full delivery fleet electrification by 2030. Other major players are also involved, including City-Link Express has incorporated EVs into its delivery fleet through a partnership with Weststar Maxus. Notably, FedEx Express completed the first-ever cross-border delivery from Malaysia to Singapore using an EV in March 2024, earning the Malaysia Book of Records recognition and advancing its goal of carbon-neutral operations by 2040.<sup>267,268</sup>

Solar Power Installations

Pos Malaysia is driving this trend with the installation of solar panels across 17 facilities, successfully reducing carbon emissions and decreasing reliance on fossil fuels. Similarly, City-Link Express is actively partnering with Sunview Group for a rooftop solar rollout, generating renewable energy to power its major logistics operations.<sup>269</sup>

Sustainable Packaging Implementation

Pos Malaysia is making measurable progress, ensuring its B2B plastic mailers now contain 80% recyclable material and its cardboard boxes use 70–90% recycled content, drastically cutting virgin-fibre use. Furthermore, they have launched a "Trash-to-Cash" programme, whereby selected post offices collect and repurpose recyclable packaging waste, successfully diverting materials from landfill and creating value within the circular economy.<sup>270,271</sup>

265. Pos Malaysia Berhad. (2024, March 22). Pos Malaysia commits to deliver net-zero targets: Net-zero carbon emissions by 2050 [Press release]. <<https://www.pos.com.my/post-list/detail?postDetailId=pressroom%2Fpos-malaysia-commits-to-deliver-net-zero-targets-net-zero-carbon-emissions-by-2050&sidemenuName=PRESS%20ROOMss>>

266. Malaysiakini. (2024, July 1). Sustainability: Malaysian logistics sector faces climate accountability gap. <<https://www.malaysiakini.com/sustainability/700555>>

267. City-Link Express. (2024). City-Link Express ESG: Sustainable and greener last-mile delivery. <<https://www.citylinkexpress.com/city-link-express-esg-sustainable-and-greener-last-mile-delivery>>

268. FedEx. (2024, August 7). FedEx sets record for company's first cross-border delivery from Malaysia to Singapore with an EV. <<https://newsroom.fedex.com/newsroom/amea/fedex-sets-record-for-the-companys-first-cross-border-delivery-from-malaysia-to-singapore-with-an-ev>>

269. Pos Malaysia Berhad. (2024, March 22). Pos Malaysia commits to deliver net-zero targets: Net-zero carbon emissions by 2050 [Press release]. <<https://www.pos.com.my/post-list/detail?postDetailId=pressroom%2Fpos-malaysia-commits-to-deliver-net-zero-targets-net-zero-carbon-emissions-by-2050&sidemenuName=PRESS%20ROOMss>>

270. Malaysiakini. (2024, July 1). Sustainability: Malaysian logistics sector faces climate accountability gap. <<https://www.malaysiakini.com/sustainability/700555>>

271. Pos Malaysia Berhad. (2024, June 28). Grow your online business with greener packaging. ><https://www.pos.com.my/knowledge-hub/grow-online-business-greener-packaging>>



# Chapter 5.2: Key Findings

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# Overview of Roles and Skills



The Malaysian Postal and Courier sector is a dynamic and diverse industry, encompassing a wide range of segments and job functions essential to national logistics and economic connectivity. To comprehensively address the impact of AI, Digital, and Green Economy trends on the Malaysian workforce, it is crucial to first establish a clear understanding of the sector's foundational structure. This analysis will therefore examine the five (5) key segments of the sector to provide a detailed overview of the integral roles and skills that are vital to its operations.

| Segments                                                                                                                                                                                                                                                     | Job Clusters                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>First Mile</b><br>The initial phase of the delivery process, where mail and parcels are collected, aggregated, and prepared for transport from the point of origin to a distribution centre, hub, depot, or warehouse.                                    | <ul style="list-style-type: none"><li>• Collection and Pick-up</li><li>• International / Cross-Border Operations</li></ul>                                        |
| <b>Middle Mile</b><br>The intermediate stage involves the movement of mail and parcels between processing centres, warehouses, or distribution hubs, which includes sorting, bulk transportation, and fleet operations.                                      | <ul style="list-style-type: none"><li>• Processing Operations (Hub/Depot/Warehouse)</li><li>• Linehaul Operation</li><li>• Fleet and Vehicle Management</li></ul> |
| <b>Last Mile</b><br>The final stage of the delivery journey, beginning at the nearest transportation hub or sorting facility and ending at the recipient's address.                                                                                          | <ul style="list-style-type: none"><li>• Delivery Services</li></ul>                                                                                               |
| <b>Data and Digital Solution</b><br>The technological backbone of the delivery ecosystem, covering software development, parcel tracking, route optimisation, and cross-border data management to improve efficiency, transparency, and customer experience. | <ul style="list-style-type: none"><li>• Data Analytics &amp; Route Optimisation</li><li>• Digital Logistics Systems &amp; Network Operations</li></ul>            |
| <b>Support</b><br>Includes cross-functional services, regulatory compliance, and operational support, ensuring smooth first-to-last-mile execution, service quality, legal adherence, and system reliability.                                                | <ul style="list-style-type: none"><li>• Data Analytics &amp; Route Optimisation</li><li>• Digital Logistics Systems &amp; Network Operations</li></ul>            |

Consolidated Job Clusters, Roles and Skills in the Postal and Courier Sector

11 Job Clusters

|                                                                          |                                                                 |                                                   |                                                                            |
|--------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------|
| <b>Collection and Pick-Up</b><br>(2 job roles)                           | <b>Data Analytics &amp; Route Optimisation</b><br>(6 job roles) | <b>Delivery Services</b><br>(5 job roles)         | <b>Digital Logistics Systems &amp; Network Operations</b><br>(3 job roles) |
| <b>Fleet and Vehicle Management</b><br>(3 job roles)                     | <b>International / Cross-Border Operations</b><br>(3 job roles) | <b>Linehaul Operation</b><br>(4 job roles)        | <b>Logistics Management</b><br>(2 job roles)                               |
| <b>Processing Operations (Hub / Depot / Warehouse)</b><br>(11 job roles) |                                                                 | <b>Regulatory and Compliance</b><br>(5 job roles) | <b>Retail Sales and Customer Service</b><br>(9 job roles)                  |

53 Job Roles\*

(\*Including one (1) Emerging Role)

27 Skills Clusters

Categorised into 25 specific skill clusters and two (2) basic skill clusters

| Specific Skills                                              |                                                             |                                                        |                                                                   |
|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------|
| <b>Accounting and Finance Management</b><br>(6 skills)       | <b>Agile and Continuous Improvement</b><br>(2 skills)       | <b>Automation and Robotics</b><br>(1 skill)            | <b>Branding, Sales, and Marketing</b><br>(2 skills)               |
| <b>Business Development and Strategy</b><br>(2 skills)       | <b>Business Operation Management</b><br>(8 skills)          | <b>Customer Service and Experience</b><br>(3 skills)   | <b>Customer, Vendor, and Stakeholder Management</b><br>(9 skills) |
| <b>Data Development and Implementation</b><br>(13 skills)    | <b>Engineering and Maintenance</b><br>(8 skills)            | <b>General Business Management</b><br>(5 skills)       | <b>Health, Safety and Environment (HSE)</b><br>(22 skills)        |
| <b>Legal and Regulatory</b><br>(2 skills)                    | <b>Manufacturing and Production</b><br>(4 skills)           | <b>People Management and Development</b><br>(3 skills) | <b>Products and Services</b><br>(2 skills)                        |
| <b>Project and Process Management</b><br>(7 skills)          | <b>Quality Management</b><br>(12 skills)                    | <b>Research and Development</b><br>(1 skill)           | <b>Risk Management, Compliance, and Governance</b><br>(24 skills) |
| <b>Software Development and Implementation</b><br>(6 skills) | <b>Supply Chain and Logistics Management</b><br>(17 skills) | <b>Technical Design and Architecture</b><br>(6 skills) | <b>Technology Management</b><br>(4 skills)                        |

Warehouse and Inventory Management  
(13 skills)

| Basic Skills                                  |                                          |
|-----------------------------------------------|------------------------------------------|
| <b>Innovation and Delivery</b><br>(10 skills) | <b>Social Intelligence</b><br>(6 skills) |

198 Skills

Which comprises 182 Specific Skills and 16 Basic Skills

Job Clusters and Roles in the Postal and Courier Sector



The Malaysian Postal and Courier sector is a comprehensive logistics ecosystem, with operations divided into five (5) key segments. The journey begins with the First Mile, where roles in Collection and Pick-up prepare items for transport. The Middle Mile involves Processing Operations and Linehaul Operation, which are supported by Fleet and Vehicle Management to move and sort parcels between hubs. The final stage, the Last Mile, is handled by Delivery Services to ensure accurate delivery.

These physical operations are underpinned by the Data and Digital Solution segment, which includes Data Analytics & Route Optimisation and Digital Logistics Systems & Network Operations. Finally, the entire system is supported by cross-functional roles such as Regulatory & Compliance, Logistic Management, and Postal Retail Sales and Customer Services, all of which ensure smooth execution and a positive customer experience.



| Job Clusters              |                                                                                                                                                                                                                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First Mile                | <b>Collection and Pick-up</b> <ul style="list-style-type: none"><li>Collection and Pick-up</li><li>Collect mail and parcels from designated points (e.g: post offices, drop boxes, customer premises)</li><li>Plan and coordinate timely movement of items into the logistics network</li></ul> |
|                           | <b>International / Cross-Border Operations</b> <ul style="list-style-type: none"><li>Manage cross-border parcel movement and customs compliance</li><li>Coordinate international shipping logistics and documentation</li></ul>                                                                 |
| Middle Mile               | <b>Processing Operations (Hub/Depot/Warehouse)</b> <ul style="list-style-type: none"><li>Sort and categorise mail and parcels based on destination, priority, and size</li><li>Ensure accurate routing and efficient handling within processing facilities</li></ul>                            |
|                           | <b>Linehaul Operation</b> <ul style="list-style-type: none"><li>Transport bulk mail and parcels between processing centers and distribution hubs</li><li>Optimise long-distance routing and fleet scheduling</li></ul>                                                                          |
|                           | <b>Fleet and Vehicle Management</b> <ul style="list-style-type: none"><li>Oversee vehicle availability, maintenance, and operational readiness</li><li>Manage scheduling, preventive maintenance, and fuel usage</li></ul>                                                                      |
| Last Mile                 | <b>Delivery Services</b> <ul style="list-style-type: none"><li>Ensure timely and accurate delivery from sorting centers to recipients</li><li>Coordinate delivery teams and optimise delivery route</li></ul>                                                                                   |
| Data and Digital Solution | <b>Data Analytics &amp; Route Optimisation</b> <ul style="list-style-type: none"><li>Leverage data for strategic and operational decision-making</li><li>Perform route planning, real-time tracking, and predictive analytics</li></ul>                                                         |
|                           | <b>Digital Logistics Systems &amp; Network Operations</b> <ul style="list-style-type: none"><li>Develop and integrate digital systems supporting postal and courier logistics</li><li>Manage operational performance of digital platforms across the logistics network</li></ul>                |
| Support                   | <b>Regulatory &amp; Compliance</b> <ul style="list-style-type: none"><li>Ensure adherence to laws, regulations, and internal policies</li><li>Support risk management and compliance framework implementation</li></ul>                                                                         |
|                           | <b>Logistic Management</b> <ul style="list-style-type: none"><li>Plan, execute, and monitor end-to-end logistics activities</li><li>Break down complex logistics tasks into manageable phases</li></ul>                                                                                         |
|                           | <b>Postal Retail Sales and Customer Services</b> <ul style="list-style-type: none"><li>Enhance customer experience at retail outlets and service points</li><li>Provide sales support, handle inquiries, and resolve issues</li></ul>                                                           |

# Consolidated job clusters and roles in the Postal and Courier Sector



Building upon the detailed examination of individual job clusters, the following table provides a consolidated overview of key roles across the Malaysian Postal and Courier sector.

| Job Clusters                                   | Roles                                 |                                        |
|------------------------------------------------|---------------------------------------|----------------------------------------|
| Collection and Pick-up                         | 1. Mail & Parcel Collection Personnel | 2. Operation Assistant                 |
| Data Analytics & Route Optimisation            | 1. Route Optimisation Planner         | 4. Operations Research Analyst         |
|                                                | 2. Data Analyst                       | 5. Real Time Analyst - Operations      |
|                                                | 3. Logistics Data Analyst             | 6. Regional Data Analyst, Cross Border |
| Delivery Services                              | 1. Branch Head                        | 4. Delivery Agent                      |
|                                                | 2. Regional Manager                   | 5. Postman & Courier                   |
|                                                | 3. Supervisor                         |                                        |
| Digital Logistics Systems & Network Operations | 1. Logistics Software Developer       | 3. Postal Network Coordinator          |
|                                                | 2. Systems Analyst                    |                                        |
| Fleet and Vehicle Management                   | 1. Fleet Manager                      | 3. Fleet Executive                     |
|                                                | 2. Fleet Assistant Manager            |                                        |

# Consolidated job clusters and roles in the Postal and Courier Sector (Continued)

| Job Clusters                                    | Roles                                                                                                                                                                                                    |                                                                                                                                                                                                                               |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| International / Cross-Border Operations         | 1. Operations Manager<br>2. Operations Specialist                                                                                                                                                        | 3. Operations Administrator                                                                                                                                                                                                   |
| Linehaul Operation                              | 1. Linehaul Supervisor / Manager<br>2. Linehaul Executive                                                                                                                                                | 3. Control Tower Executive - Linehaul<br>4. Linehaul Driver                                                                                                                                                                   |
| Logistic Management                             | 1. Operations Excellence & Project Executive                                                                                                                                                             | 2. Recovery & PMO Operations Executive                                                                                                                                                                                        |
| Processing Operations (Hub / Depot / Warehouse) | 1. Processing Manager / Hub Manager<br>2. Fulfilment Executive<br>3. Hub Supervisor<br>4. Machineries / Maintenance Engineer / Technician<br>5. Quality Control Inspector/ Inspector Postman/ Supervisor | 6. Hub Operator<br>7. Inbound / Outbound Coordinator<br>8. Indoor Postman / Indoor Courier / Hub Operation Assistant<br>9. Load & Dispatch Handler<br>10. Scanning & Data Entry Clerk<br>11. Warehouse Operator / Coordinator |
| Regulatory & Compliance                         | 1. Head of Security<br>2. Regulatory Compliance Officer<br>3. Data Privacy Officer                                                                                                                       | 4. Policy Officer<br>5. Head of Sustainability                                                                                                                                                                                |
| Retail Sales and Customer Service               | 1. State Retail Manager<br>2. Area Manager / Supervisor<br>3. Sales Account Manager<br>4. Customer Service Specialist<br>5. Customer Service Logistics Liaison                                           | 6. Logistics Support Assistant<br>7. Office Clerk<br>8. Collection Point Admin<br>9. Returns & Claims Coordinator                                                                                                             |

# Skills Clusters and Skills

Two (2) basic skills clusters and 25 specific skills clusters have been identified for the Postal and Courier sector.

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BASIC SKILLS</b><br><br>Essential skills required for a person to be fit for a job.                                                                                                                               | <b>Innovation and Delivery</b> <ul style="list-style-type: none"><li>Adaptability and Resiliency</li><li>Business Acumen</li><li>Change Management</li><li>Cognitive Skills</li><li>Critical Thinking</li><li>Digital and AI Fluency</li><li>Innovative Thinking</li><li>Learning Agility</li><li>Planning and Organising</li><li>Sustainability Awareness</li></ul> |
|                                                                                                                                                                                                                      | <b>Social Intelligence</b> <ul style="list-style-type: none"><li>Coaching and Mentoring</li><li>Communication</li><li>Conflict Management</li><li>Empathy</li><li>Influencing and Negotiation</li><li>Teamwork and Collaboration</li></ul>                                                                                                                           |
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>Accounting and Finance Management</b> <ul style="list-style-type: none"><li>Cash Application</li><li>Claims Management</li><li>Cost-Benefit Analysis</li><li>Credit and Collections Management</li><li>Documentation Management and Control</li><li>Invoice Processing</li></ul>                                                                                  |
|                                                                                                                                                                                                                      | <b>Agile and Continuous Improvement</b> <ul style="list-style-type: none"><li>Continuous Improvement</li><li>5S Techniques</li></ul>                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                      | <b>Automation Process Control</b> <ul style="list-style-type: none"><li>Automation and Robotics</li></ul>                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | <b>Branding, Sales, and Marketing</b> <ul style="list-style-type: none"><li>Sales Strategy and Execution</li><li>Sales Target Management</li></ul>                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                      | <b>Business Development and Strategy</b> <ul style="list-style-type: none"><li>Business Intelligence</li><li>Business Performance Management</li></ul>                                                                                                                                                                                                               |



# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>Business Operation Management</b> <ul style="list-style-type: none"><li>Access Control Management</li><li>Cargo Receipt and Inspection</li><li>Cargo Issuance and Dispatch</li><li>Dashboard Creation and Visualisation</li><li>Operations Management</li><li>Operations Reporting Protocol</li><li>Reporting and Documentation</li><li>Retail Administration</li></ul>                                                                        |
|                                                                                                                                                                                                                      | <b>Customer Service and Experience</b> <ul style="list-style-type: none"><li>Customer Experience Design</li><li>Language Literacy</li><li>Service Excellence</li></ul>                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | <b>Customer, Vendor, and Stakeholder Management</b> <ul style="list-style-type: none"><li>Account Management</li><li>Customer Acquisition and Retention Management</li><li>Customer Challenges Management</li><li>Customer Relationship Management</li><li>Service Level Management</li><li>Stakeholder Management</li><li>Supplier Relationship Management (SRM)</li><li>Technical Sales Support</li><li>Vendor Management</li></ul>             |
|                                                                                                                                                                                                                      | <b>Engineering and Maintenance</b> <ul style="list-style-type: none"><li>Equipment and System Value Engineering</li><li>Equipment and Systems Testing</li><li>Equipment Maintenance</li><li>Equipment Management</li><li>Maintenance Planning and Scheduling</li><li>Predictive Maintenance</li><li>Preventive Maintenance</li><li>Troubleshooting</li></ul>                                                                                      |
|                                                                                                                                                                                                                      | <b>Data Development and Implementation</b> <ul style="list-style-type: none"><li>Database Management</li><li>Data Literacy</li><li>Data Management</li><li>Data Visualisation</li><li>Data Validation</li><li>Big Data Analytics</li><li>Database Querying</li><li>Statistical Analytics</li><li>Data Mining and Modelling</li><li>Data Storyboarding</li><li>Data Strategy</li><li>Data Science</li><li>Business Environment Analytics</li></ul> |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | <b>General Business Management</b> <ul style="list-style-type: none"><li>Budget Management</li><li>Cost Management</li><li>Organisational Analysis Management</li><li>Problem Identification</li><li>Resource Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                      | <b>Health, Safety, and Environment (HSE)</b> <ul style="list-style-type: none"><li>Emergency Response</li><li>Environment, Health and Safety</li><li>Incident and Accident Investigation</li><li>Incident Investigation</li><li>Inclement Weather Operations and Planning</li><li>Renewable Energy</li><li>Safety Integrity Levels Management</li><li>Security Awareness</li><li>Store Facilities and Housekeeping</li><li>Store Security Policy</li><li>Sustainability Management</li><li>Sustainable Business Practices</li><li>Sustainable Facilities Management</li><li>Sustainable Manufacturing</li><li>Sustainable Sourcing</li><li>Sustainable Transportation Management</li><li>Sustainable Utilities Management</li><li>Warehousing / Cargo-related Occupational Health and Safety Management</li><li>Waste Disposal Management</li><li>Workplace Safety and Health</li><li>Workplace Safety and Health Incident Management</li><li>Workplace Safety and Health Practices Implementation</li></ul> |
|                                                                                                                                                                                                                      | <b>Legal and Regulatory</b> <ul style="list-style-type: none"><li>Knowledge of Legal and Compliance</li><li>Legal and Regulatory Research</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                      | <b>Manufacturing and Production</b> <ul style="list-style-type: none"><li>Equipment Operation</li><li>Operations Performance</li><li>Packaging Process</li><li>Troubleshooting and Maintenance</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                      | <b>People Management and Development</b> <ul style="list-style-type: none"><li>Organisational Relationship Building</li><li>People and Performance Management</li><li>Training Programme Development</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | <b>Project and Process Management</b> <ul style="list-style-type: none"><li>Business Process Management</li><li>Process Mapping</li><li>Process Modelling</li><li>Process Monitoring</li><li>Process Optimisation</li><li>Process Standardisation</li><li>Project Management</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# Skills Clusters and Skills (Continued)

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Products and Services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Demand and Supply Analysis</li><li>Product Advisory</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                      | Quality Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Attention to Detail</li><li>Audit Compliance</li><li>Document Control</li><li>Packaging Testing</li><li>Quality Control and Assurance</li><li>Quality Control Management</li><li>Quality Management System Coordination</li><li>Root Cause Analysis (RCA)</li><li>Root Cause Corrective Action (RCCA)</li><li>Service Quality Management</li><li>Technical Inspection</li><li>Verification and Validation</li></ul>                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                      | Research and Development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Technical Report Writing</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                                                                                                                                                                                      | Risk Management, Compliance, and Governance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Audit and Compliance Strategy Development</li><li>Audit Management</li><li>Business Risk Management</li><li>Compliance Reporting</li><li>Corporate Governance</li><li>Cyber and Data Breach Incident Management</li><li>Cyber Risk Management</li><li>Cybersecurity Management</li><li>Data Governance</li><li>Data Privacy and Security</li><li>Data Protection Management</li><li>International Trade Legislation Compliance</li><li>Loss and Risk Prevention Management</li><li>Operational Risk Management</li><li>Policy Implementation and Revision</li><li>Portfolio and Investment Risk Management</li><li>Product Risk Assessment</li><li>Regulatory Compliance</li><li>Risk Management</li><li>Security Governance</li><li>Security Strategy</li></ul> |
|                                                                                                                                                                                                                      | Software Development and Implementation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Applications Integration</li><li>Encryption and Cryptography</li><li>Programming, Coding and Scripting</li><li>Security Assessment and Testing</li><li>Security Programme Management</li><li>Software Development Lifecycle (SDLC)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Skills Category                                                                                                                                                                                                      | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPECIFIC SKILLS</b><br><br>Skills relating to a specific task or situation. It involves both understanding and proficiency in such specific activity that involves methods, processes, procedures, or techniques. | Technical Design and Architecture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Computer-aided Design</li><li>Digital Image Production</li><li>Digital Operating Hardware and Software System</li><li>Embedded Systems Integration</li><li>Packaging Design and Development</li><li>User Interface and User Experience (UI/UX) Optimisation</li></ul>                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                      | Technology Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Internet of Things Management</li><li>Systems Integration</li><li>Technology Adoption and Innovation</li><li>Workflow Automation</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                      | Supply Chain and Logistics Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Cargo Tracking System Administration</li><li>Contract Management</li><li>Defensive Riding and Driving</li><li>Delivery Management</li><li>Distribution Planning</li><li>Load Distribution Analysis</li><li>Logistics Management</li><li>Material Loading and Unloading Administration</li><li>Order Fulfilment Administration</li><li>Order Fulfilment and Returns Processing</li><li>Procurement Items Management</li><li>Procurement Management</li><li>Route Planning and Optimisation</li><li>Supplier Performance Evaluation</li><li>Supply Chain Management</li><li>Transport Management System Administration</li><li>Transportation Management</li></ul> |
|                                                                                                                                                                                                                      | Warehouse and Inventory Management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>Asset and Inventory Management</li><li>Inventory Control Management</li><li>Inventory Management</li><li>Safe Loading Techniques</li><li>Warehouse Administration</li><li>Warehouse Facility Management</li><li>Warehouse Facility Security Control</li><li>Warehouse Layout Design</li><li>Warehouse Maintenance and Housekeeping</li><li>Warehouse Management System Administration</li><li>Warehouse Management Systems (WMS)</li><li>Warehouse Performance Measurement</li><li>Warehouse Space Utilisation</li></ul>                                                                                                                                         |



# In-Demand Skills

The evolving demands of the Postal and Courier sector, shaped by the pursuit of operational excellence, regulatory complexity, and the imperative for sustainability, have elevated a specific set of skills as critical across job roles. The impact study findings reveal several in-demand skills that are indispensable for the effective functioning and future growth of the Malaysian Postal and Courier sector. These high-priority skills are essential not only for operational excellence but also for upholding efficiency, compliance, and long-term sector success. These skills are fundamental to ensuring quality, efficiency, and sustainability across the sector.

|   |                                         |                                                                                                                                                                                                                                                                                                                                                    |
|---|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Logistics Management                    | <ul style="list-style-type: none"><li>A core skill for coordinating the entire supply chain, from collection to delivery. It is essential for ensuring timely deliveries, optimising resource use, and maintaining service reliability, which allows for scalability in high-volume environments.</li></ul>                                        |
| 2 | Operations & Process Management:        | <ul style="list-style-type: none"><li>This skill is crucial for aligning day-to-day activities with strategic goals. It involves monitoring key performance indicators (KPIs), identifying inefficiencies, and driving continuous improvement to enhance overall operational performance and customer satisfaction.</li></ul>                      |
| 3 | Compliance & Documentation Management   | <ul style="list-style-type: none"><li>A vital skill given increasing regulatory scrutiny. It involves the systematic handling of operational records, service logs, and regulatory documentation to ensure adherence to legal standards, support audits, and build public trust through transparent operations.</li></ul>                          |
| 4 | Data Management                         | <ul style="list-style-type: none"><li>The backbone of digital communication. Proficiency in protocols enables reliable data transmission, device interoperability, and efficient information routing across diverse networks.</li></ul>                                                                                                            |
| 5 | Cloud Computing                         | <ul style="list-style-type: none"><li>With the growing reliance on data, effective data management is critical for operational efficiency and service enhancement. It ensures the secure, accurate, and accessible handling of large volumes of operational and customer data, which is foundational for data analytics and forecasting.</li></ul> |
| 6 | Route Planning & Optimisation           | <ul style="list-style-type: none"><li>An essential efficiency driver, especially for last-mile delivery. This skill involves determining the most efficient routes to reduce delivery times and fuel costs, directly contributing to enhanced customer experience and cost savings.</li></ul>                                                      |
| 7 | Customer Relationship Management (CRM): | <ul style="list-style-type: none"><li>An essential skill for frontline staff who handle customer queries and feedback. It ensures consistent, responsive, and personalised interactions, which are key to resolving issues, managing complaints, and building long-term customer loyalty.</li></ul>                                                |

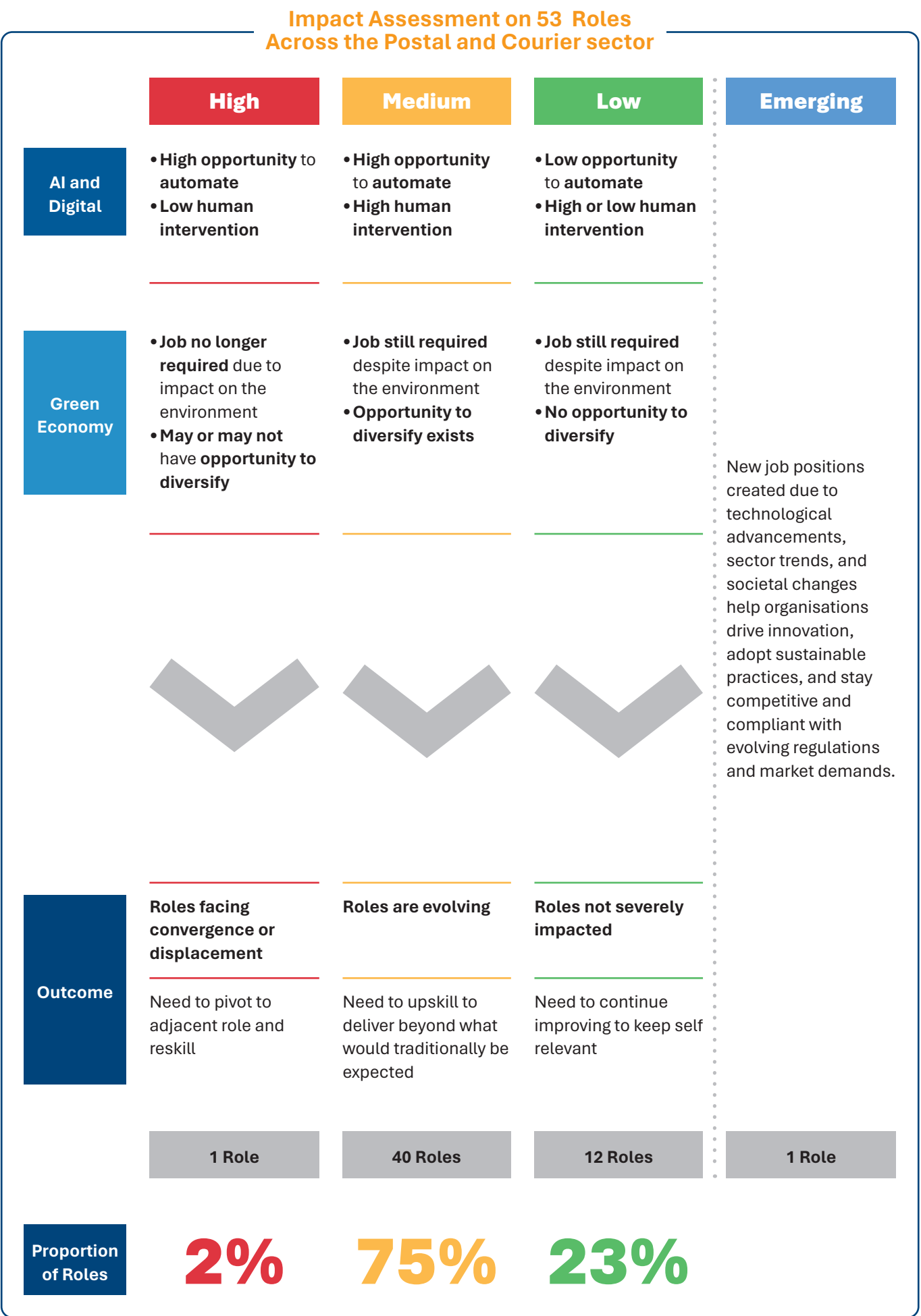


| Skills Category                                                                                                     | Skills Clusters                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Top 10 Basic Skills                                                                                                 | <b>Innovation and Delivery</b> <ul style="list-style-type: none"><li>Adaptability and Resiliency</li><li>Cognitive Skills</li><li>Critical Thinking</li><li>Digital and AI Fluency ●</li><li>Innovative Thinking</li><li>Learning Agility</li><li>Sustainability Awareness ●</li></ul>                                                                                                  |
|                                                                                                                     | <b>Social Intelligence</b> <ul style="list-style-type: none"><li>Communication</li><li>Empathy</li><li>Teamwork and Collaboration</li></ul>                                                                                                                                                                                                                                             |
| Top 10 Specific Skills <ul style="list-style-type: none"><li>● AI / Digital Skills</li><li>● Green Skills</li></ul> | <ul style="list-style-type: none"><li>Compliance Reporting</li><li>Reporting and Documentation</li><li>Data Management ●</li><li>Process Optimisation</li><li>Logistics Management</li><li>Operations Performance</li><li>Documentation Management and Control</li><li>Operations Management</li><li>Route Planning and Optimisation</li><li>Customer Relationship Management</li></ul> |

# Roles and Skills Analysis by Impact Level



Based on insights from workshops and stakeholder engagements, sector players in the Postal and Courier sector provided assessments on how AI, Digital, and the Green Economy are reshaping roles across their organisations. These perspectives informed the classification of roles into three (3) impact levels: high, medium, and low, reflecting the degree of vulnerability or adaptability to technological disruption and sustainability imperatives. The analysis shows that while operational roles such as parcel collection, delivery, and dispatch remain less impacted due to their physical and service-oriented nature, administrative and clerical functions face higher disruption from automation and digital record-keeping systems. At the same time, medium-impacted roles, spanning hub operations, logistics management, and customer services, are evolving steadily through the adoption of digital tracking, route optimisation, and green logistics practices. In addition, the study also identifies an emerging role, reflecting the sector’s increasing focus on regulatory oversight, consumer protection, and service quality in an era of rapid digitalisation and rising customer expectations. By mapping these role shifts, the study provides clarity on career pathways and the evolving skills needed to build a workforce that can sustain growth, enhance service reliability, and support Malaysia’s transition into a modern, parcel-centric Postal and Courier sector.





# Overview of Roles by Impact Level

The study has revealed a total of 54 key roles within the Postal and Courier sector, with a significant majority showing signs of evolution rather than displacement. The findings highlight how the workforce is adapting to the convergence of AI, Digital, and Green Economy, with roles categorised by their level of impact.

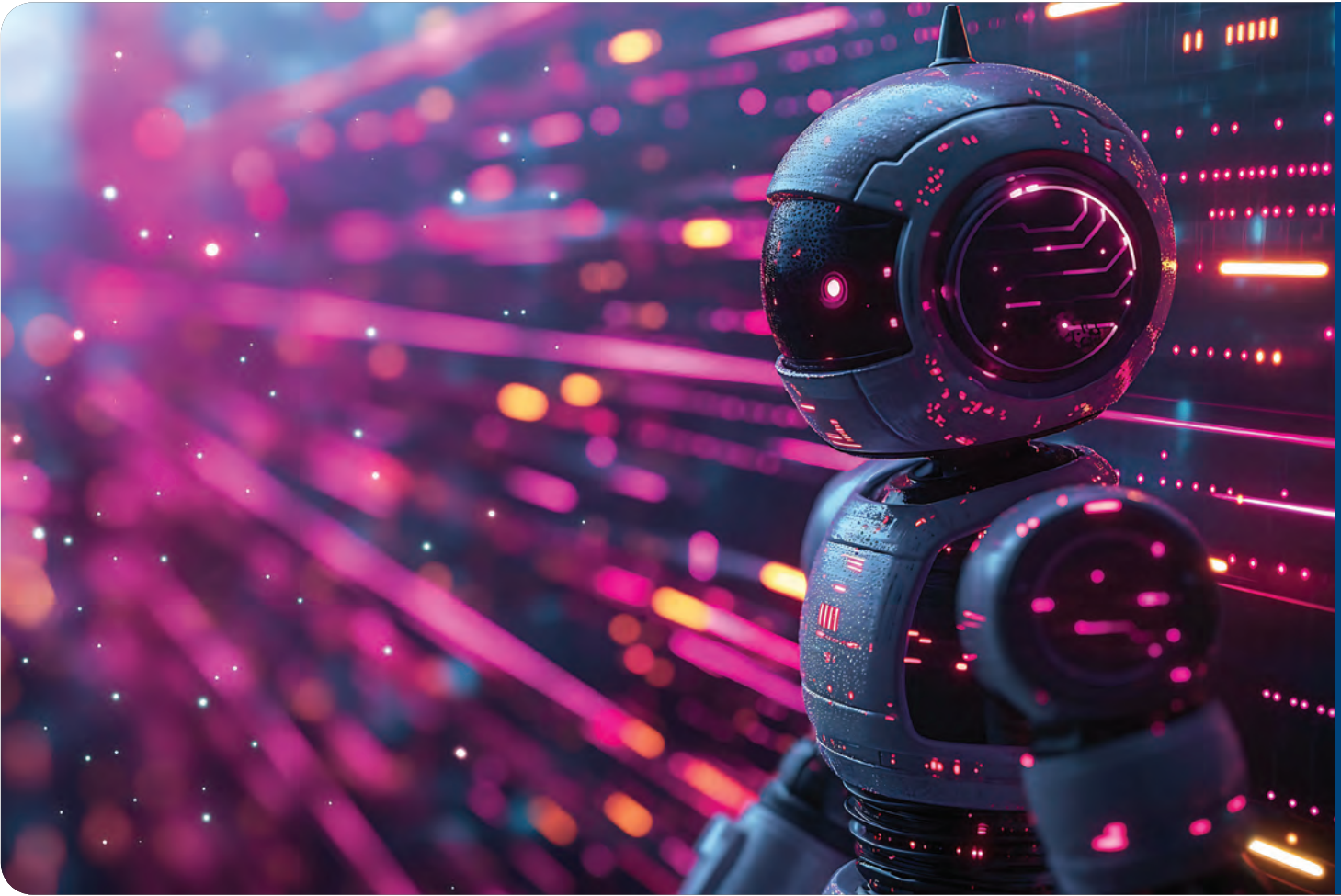
The vast majority of the sector, comprising 40 roles (75%), falls into the "evolving" category. These positions are not at risk of being replaced, but to remain relevant, individuals must upskill to deliver beyond what would traditionally be expected. This large group forms the operational backbone of the industry, and their ability to adapt is crucial for maintaining sector standards and future growth.

In contrast, a smaller proportion of the workforce is found at the extremes of the impact spectrum. Only a single role (2%) has been identified as highly impacted and potentially facing convergence or displacement, underscoring its strategic importance. At the other end, 12 roles (23%) have been deemed not severely impacted; while stable, those in these positions must continue to improve their skills to ensure they remain relevant.

Finally, the study identified one (1) emerging role that reflects the sector's pivot towards digitalisation and sustainability. This new position signals the future direction of skill demand, indicating a need for workforce development that can support innovation and build the sector's resilience in a rapidly changing market.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div>HIGH</div><div>1 Role</div><div>1. Office Clerk</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <div>14. Warehouse Operator / Coordinator</div> <div>15. Inbound / Outbound Coordinator</div> <div>16. Fulfilment Executive</div> <div>17. Area Manager / Supervisor</div> <div>18. State Retail Manager</div> <div>19. Sales Account Manager</div> <div>20. Customer Service Specialist</div> <div>21. Returns &amp; Claims Coordinator</div> <div>22. Customer Service Logistics Liaison</div> <div>23. Logistics Support Assistant</div> <div>24. Collection Point Admin</div> <div>25. Operations Excellence &amp; Project Executive</div> <div>26. Recovery &amp; PMO Operations Executive</div> <div>27. Quality Control Inspector / Inspector Postman / Supervisor</div> <div>28. Scanning &amp; Data Entry Clerk</div> <div>29. Machineries / Maintenance Engineer / Technician</div> | <div>30. Linehaul Supervisor / Manager</div> <div>31. Linehaul Executive</div> <div>32. Control Tower Executive - Linehaul</div> <div>33. Linehaul Driver</div> <div>34. Fleet Manager</div> <div>35. Fleet Assistant Manager</div> <div>36. Fleet Executive</div> <div>37. Head of Sustainability</div> <div>38. Head of Security</div> <div>39. Regulatory Compliance Officer</div> <div>40. Policy Officer</div> | <div><div>LOW</div><div>12 Roles</div><div>1. Mail &amp; Parcel Collection Personnel</div><div>2. Hub Supervisor</div><div>3. Load &amp; Dispatch Handler</div><div>4. Operations Manager</div><div>5. Operations Specialist</div><div>6. Operations Administrator</div><div>7. Regional Manager</div><div>8. Branch Head</div><div>9. Supervisor</div><div>10. Postman &amp; Courier</div><div>11. Delivery Agent</div><div>12. Data Privacy Officer</div></div> |
| <div><div>MEDIUM</div><div>40 Roles</div><div>1. Data Analyst</div><div>2. Logistics Data Analyst</div><div>3. Regional Data Analyst, Cross Border</div><div>4. Real Time Analyst</div><div>5. Operations Research Analyst</div><div>6. Route Optimisation Planner</div><div>7. Systems Analyst</div><div>8. Logistics Software Developer</div><div>9. Postal Network Coordinator</div><div>10. Operation Assistant</div><div>11. Processing Manager / Hub Manager</div><div>12. Hub Operator</div><div>13. Indoor Postman / Indoor Courier</div></div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                     | <div><div>EMERGING</div><div>1 Role</div><div>1. Head of Postal Inspectorate</div></div>                                                                                                                                                                                                                                                                                                                                                                          |

# Highly Impacted Roles and Career Pathways



The Office Clerk role within the Postal and Courier sector is classified as highly impacted by the adoption of AI and digital technologies. This is primarily due to the structured and repetitive nature of its core administrative tasks, which are highly suitable for automation. AI tools such as Optical Character Recognition (OCR) can automate document processing, data entry, and classification with high accuracy.

Similarly, AI-powered chatbots can manage routine communications and scheduling, while automated systems can generate reports and validate data with minimal human oversight. The integration of digital platforms further streamlines administrative functions through electronic filing systems and workflow automation. As a result, the need for manual intervention is significantly reduced, with human input now primarily required for exception handling, quality assurance, and managing sensitive or confidential information.

| Overview of One (1) Highly Impacted Role |                           |
|------------------------------------------|---------------------------|
| Job Cluster                              | Roles                     |
| Support                                  | <div>• Office Clerk</div> |

# Highly Impacted Roles Career Pathways

Highly Impacted Role

#01

Support Office Clerk

Despite this high potential for automation, the Office Clerk role holds a crucial opportunity to contribute to the sector’s green initiatives. While not a traditionally 'green' role, it can support sustainability by promoting paperless documentation, assisting with sustainability reporting, and aiding in eco-compliance processes. By upskilling in these areas and leveraging new digital tools, Office Clerks can transition from a traditional administrative support function into more specialised roles. This evolution allows professionals to contribute meaningfully to the sector's broader environmental and sustainability goals while adapting to the digital future.

**Job Purpose:**

- Responsible for providing comprehensive administrative and clerical support to a department, with duties that include managing documents, handling communications, and assisting with daily operations.

| AI                                                                                                                                                                                                                                                                               | DIGITAL SKILLS                                                                                                                                                                                                                                                                       | GREEN SKILLS                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>High Opportunity to Automate:</b></p> <p>AI automates a wide range of administrative tasks. This includes data entry, document processing, communications, scheduling, report generation, and validation using technologies like OCR and chatbots.</p>                     | <p><b>High Opportunity to Automate:</b></p> <p>Digital tools are also highly effective at automating routine office tasks. This includes automating filing, emails, scheduling, and workflows, which significantly reduces paperwork and minimises manual administrative effort.</p> | <p><b>Low Environmental Impact on the Role:</b></p> <p>This particular role has no direct or immediate harmful impact on the environment.</p>                                                                                                                  |
| <p><b>Low Human Intervention:</b></p> <p>The highly structured and repetitive nature of these tasks means minimal human input is required. Human intervention is primarily limited to handling exceptions, managing confidential information, and performing quality checks.</p> | <p><b>Low Human Intervention:</b></p> <p>The role requires minimal human intervention as most of these digital tasks are repetitive and highly automatable, allowing for seamless and efficient processing.</p>                                                                      | <p><b>High Opportunity to Diversify:</b></p> <p>The role can easily transition and evolve into new functions that support sustainability initiatives, such as sustainability reporting, eco-compliance, and the management of digital green documentation.</p> |

| Upskilling and Reskilling                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Potential Career Pathways                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>Transferable Skills*</div> <ul style="list-style-type: none"><li>Data Management ●</li><li>Database Management ●</li><li>Warehouse Administration</li></ul> <div>Additional Skills*</div> <ul style="list-style-type: none"><li>Process Standardisation</li><li>Operations Performance</li><li>Logistics Management</li><li>Digital Operating Hardware and Software System</li><li>Technical Sales Support</li></ul>                                                                         | <div>Possible Roles for Transition Within the Sector</div> <div>1. Collection and Pick-up: Operation Assistant</div> <p>Support parcel processing by tracking, labeling, and entering item information into digital systems and logistics software to ensure accurate and timely updates.</p> <div>2. Retail Sales and Customer Service: Customer Service Specialist</div> <p>Handle customer inquiries across multiple channels, provides accurate product information, resolve service issues and performs basic equipment checks.</p> <div>3. Retail Sales and Customer Service: Customer Service Logistics Liaison</div> <p>Act as the link between logistics operations and customer service teams, addressing delivery-related inquiries and helping to improve customer satisfaction.</p> |
| <div>Transferable Skills*</div> <ul style="list-style-type: none"><li>Compliance Reporting</li><li>Documentation Management and Control</li><li>Reporting and Documentation</li><li>Quality Control and Assurance</li><li>Workflow Automation ●</li></ul> <div>Additional Skills*</div> <ul style="list-style-type: none"><li>Customer Relationship Management</li><li>Customer Challenges Management</li><li>Product Advisory</li><li>Service Excellence</li></ul>                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <div>Transferable Skills*</div> <ul style="list-style-type: none"><li>Compliance Reporting</li><li>Documentation Management and Control</li><li>Reporting and Documentation</li><li>Quality Control and Assurance</li><li>Workflow Automation ●</li></ul> <div>Additional Skills*</div> <ul style="list-style-type: none"><li>Customer Relationship Management</li><li>Customer Challenges Management</li><li>Data Validation ●</li><li>Logistics Management</li><li>Service Excellence</li></ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |



# Highly Impacted Roles Career Pathways

(Continued)

Highly Impacted Role

#01

Support Office Clerk (Continued)



## Case Study

### Innovating with AI: The Australia Post Story

The story of Australia Post's digital transformation is a powerful example of how a traditional postal service can adapt to the modern era. Faced with declining mail volumes and a surge in e-commerce, the organisation was aware that it had to find a way to become more efficient. Its solution lay in the power of cloud-based AI and digital tools.

By adopting Google Cloud's OCR technology, Australia Post could automatically read and process address information on parcels. The new system boosted address-reading accuracy by a remarkable 35%. By combining this AI with real-time analytics, telematics, and a network of 35,000 handheld scanners, Australia Post created a streamlined system for parcel tracking and delivery. This comprehensive technological overhaul enabled the company to successfully navigate the shift in consumer behaviour, keeping pace with rising e-commerce demand and securing its position as a modern logistics leader.

### Optimising Operations: The DHL Global Forwarding Story

As a global logistics giant, DHL Global Forwarding (DGFF) understands the importance of speed and accuracy. To maintain its competitive edge, the company turned to RPA to streamline its back-end operations.

DGFF began deploying software bots that could mimic how humans perform repetitive tasks in digital systems. These bots could handle routine clerical activities like invoice processing and shipment data updates with greater speed and accuracy than a human workforce. This automation was not about replacing people but about liberating them. By eliminating bottlenecks and freeing up employees from tedious, low-value work, DGFF's teams could focus on more strategic and complex tasks. Ultimately, this investment in RPA has improved efficiency and scalability across their global logistics operations, allowing the company to handle vast volumes of transactions and data with greater precision.

## Upskilling and Reskilling

### Transferable Skills\*

- Order Fulfilment Administration
- Warehouse Administration

- Data Management ●
- Reporting and Documentation

### Additional Skills\*

- Automated Manufacturing Maintenance ●
- Dangerous Goods Management
- Environmental Remediation
- Hazardous Materials Identification
- Warehouse Facility Management

- Accounting Principles
- Invoice Management
- Invoice Processing
- Vendor Management
- Enterprise Resource Planning (ERP)

## Potential Career Pathways

### Possible Roles for Transition into Other Sectors

#### 1. Food Manufacturing and Services: Warehouse Storekeeper / Inventory Coordinator

Coordinate day-to-day warehouse operations, ensuring safe equipment use, accurate inventory handling, and effective collaboration with internal and external stakeholders.

#### 2. Global Business Services: Invoice Processing Administrator

Responsible for ensuring accurate and timely processing of invoices, maintaining compliance and financial integrity, and supporting efficient accounts payable operations through verification, reconciliation, and process improvement.

● AI / Digital Skills ● Green Skills \*Skills are non-exhaustive

# Medium and Low Impacted Roles Analysis



## Medium Impacted Roles

The analysis shows that a significant majority of the sector's roles, approximately 75%, are medium impacted roles, primarily due to their operational nature. These roles, though not easily displaced by automation, are increasingly influenced by the growing integration of AI and digital tools, as well as sustainability practices. Rather than becoming obsolete, they are being reshaped, demanding new skill sets to keep pace with evolving consumer expectations, environmental regulations, and industry standards.

Medium impacted roles in the Postal and Courier sector require ongoing upskilling as AI and digital adoption drive advancements in route optimisation and sustainable fleet management. Day-to-day functions, such as those of a delivery driver, sortation officer, or fleet supervisor, are still heavily reliant on human expertise but now require enhanced digital fluency and green literacy. Technologies such as telematics, real-time tracking, and automated sorting systems are being introduced into traditionally manual workflows, while the transition to electric vehicles and sustainable packaging is raising the bar for environmental accountability.

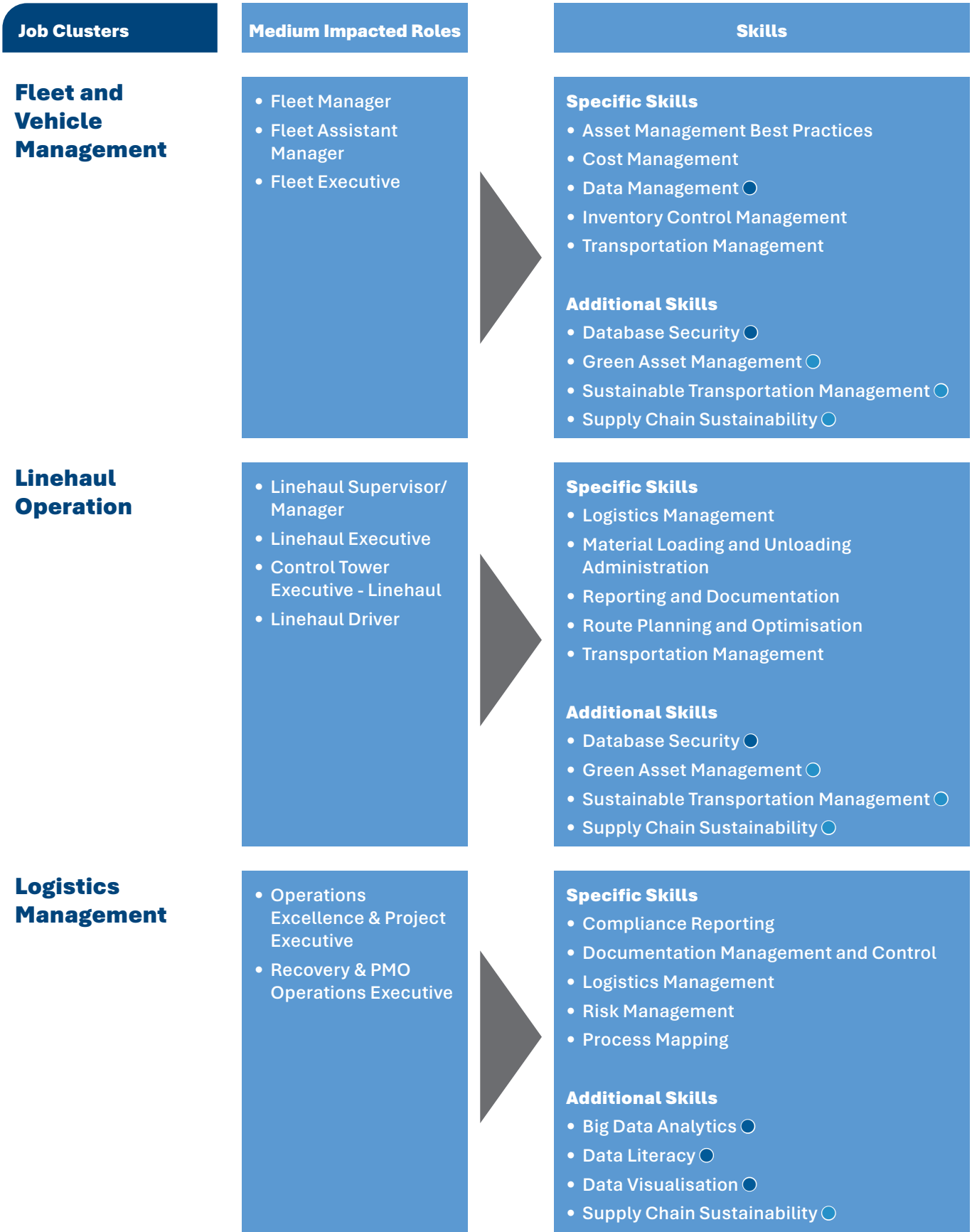
As a result, workers across these roles must be prepared to adapt, not be replaced. The future of the sector hinges on strategic upskilling, where professionals transition from task-based executors to informed planners, data users, and sustainability advocates. The Postal and Courier sector, long perceived as labour-intensive, is now at a tipping point: those who embrace this blended future of physical execution and digital oversight will drive progress, while those who resist risk being left behind.

### On-Demand Skills Analysis for 40 Medium Impacted Roles

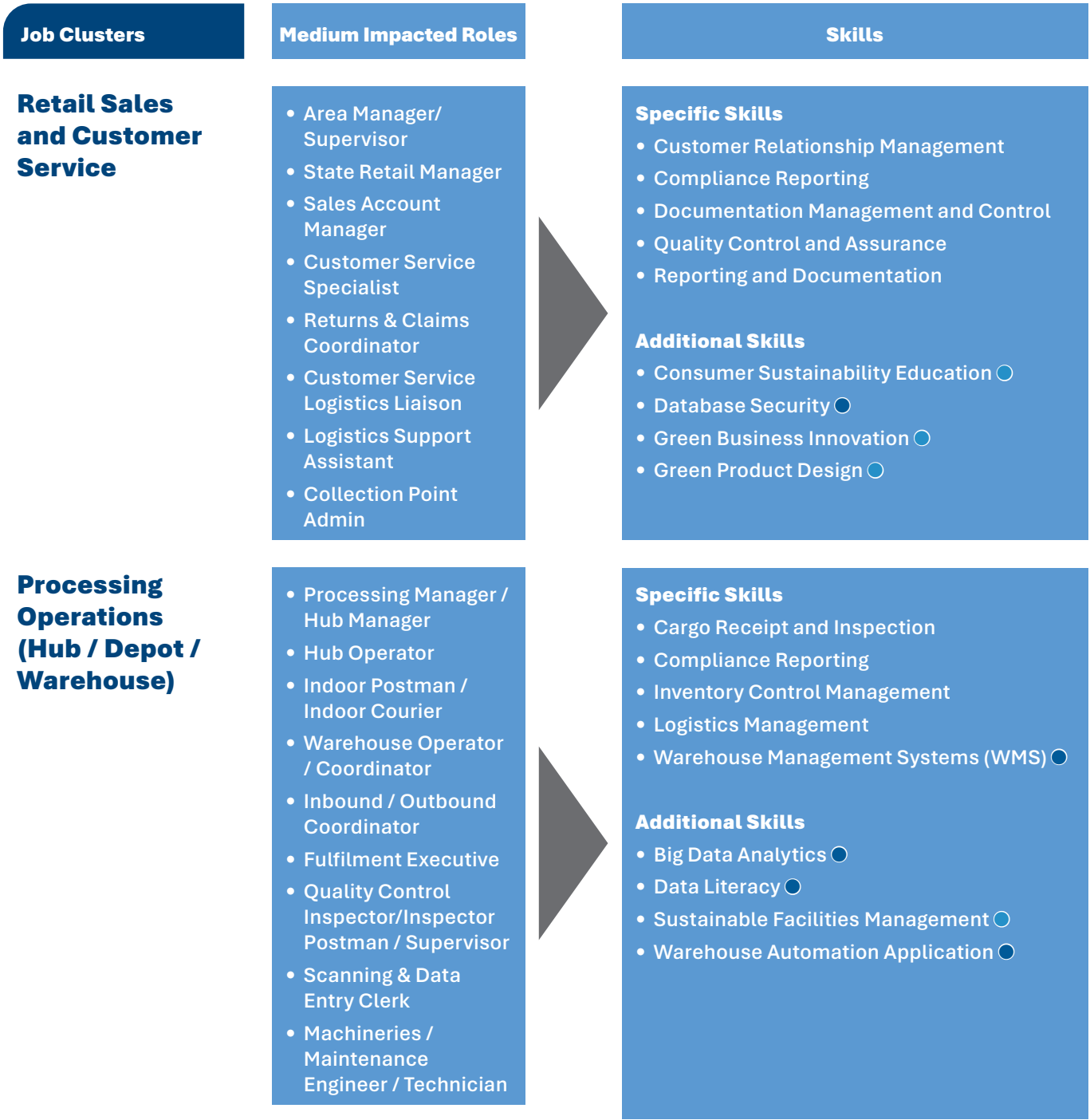
| Job Clusters                                   | Medium Impacted Roles                                                                                                                                                                                                                    | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collection and Pick-Up                         | <ul style="list-style-type: none"><li>Operation Assistant</li></ul>                                                                                                                                                                      | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Cash Application</li><li>Database Management</li><li>Process Standardisation</li><li>Technical Sales Support</li><li>Warehouse Administration</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Data Ethics</li><li>Data Literacy</li><li>Data Privacy and Security</li><li>Supply Chain Sustainability</li></ul></div>                                     |
| Data Analytics & Route Optimisation            | <ul style="list-style-type: none"><li>Data Analyst</li><li>Logistics Data Analyst</li><li>Regional Data Analyst, Cross Border</li><li>Real Time Analyst</li><li>Operations Research Analyst</li><li>Route Optimisation Planner</li></ul> | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Dashboard Creation and Visualisation</li><li>Data Management</li><li>Data Mining and Modelling</li><li>Data Visualisation</li><li>Process Optimisation</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Automated System Design</li><li>Database Security</li><li>Data Protection Management</li><li>Sustainable Transportation Management</li></ul></div> |
| Digital Logistics Systems & Network Operations | <ul style="list-style-type: none"><li>Systems Analyst</li><li>Logistics Software Developer</li><li>Postal Network Coordinator</li></ul>                                                                                                  | <div><b>Specific Skills</b><ul style="list-style-type: none"><li>Dashboard Creation and Visualisation</li><li>Data Management</li><li>Operations Reporting Protocol</li><li>Process Optimisation</li><li>Systems Integration</li></ul></div> <div><b>Additional Skills</b><ul style="list-style-type: none"><li>Database Security</li><li>Data Protection Management</li><li>Green IT Practices</li><li>Network Security</li></ul></div>                      |

- AI / Digital Skills
- Green Skills

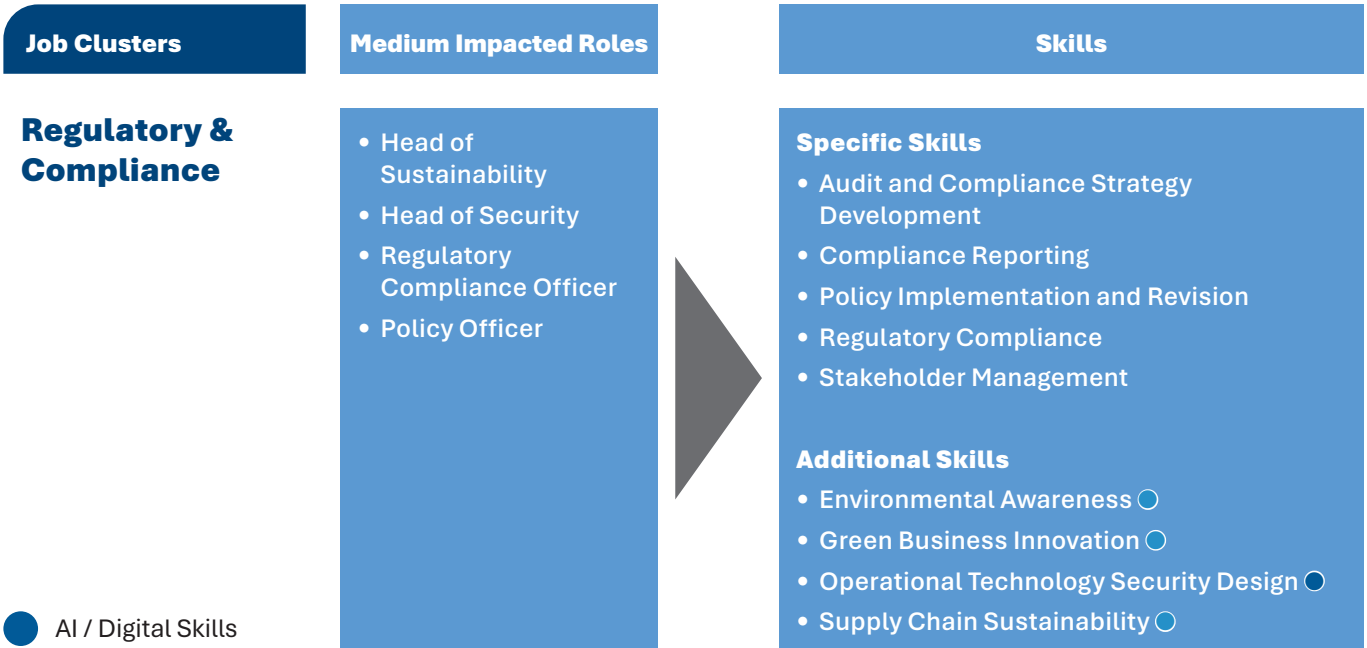




- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills



Example: Illustration of Medium Impacted Roles

Medium impacted Role #01 Processing Operations (Hub and Depot / Warehouse): Hub Operator

| Roles                                                                                                                                                                                                                                                                                         | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hub Operator</b> <p><b>Job Purpose:</b></p> <ul style="list-style-type: none"><li>Responsible for handling parcels within a hub or depot by unloading incoming items, scanning and sorting them, preparing shipment manifests, and ensuring outgoing items are correctly loaded.</li></ul> | <b>AI / Digital Skills</b> <p><b>1. Warehouse Automation Application</b><br/>This skill enables an operator to use computer software and automated equipment to streamline warehouse tasks, such as scanning, sorting, and inventory tracking, which supports faster and more accurate parcel processing.</p> <b>Green Skills</b> <p><b>1. Environmental Awareness</b><br/>This skill enables an operator to recognise the environmental impact of hub activities and apply sustainable practices such as waste segregation and energy-efficient operations, supporting the organisation's green goals.</p> |

**Case Study**

**Innovating with Robotics at FedEx**

At its air network location in Cologne, FedEx integrated AI into its hub operations with the deployment of an innovative AI-powered robotic arm. This marked a significant step in the company's commitment to digitising its operations and developing a smart logistics infrastructure within its European network.

This advanced robot now assists human team members by sorting documents and small parcels, processing up to 1,000 pieces per hour and managing approximately 90 destinations simultaneously. The primary benefit of this technology is the reduction of physical strain on employees, as the robots take over repetitive, high-volume tasks. This shift allows human operators to concentrate on more complex and value-added responsibilities, enhancing both efficiency and employee well-being within the hub.



Medium impacted Role

#02

Linehaul Operations:  
Fleet Manager

| Roles                                                                                                                                                                                                                                                                                                                                      | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fleet Manager</b><br><br><b>Job Purpose:</b> <ul style="list-style-type: none"><li>Oversee the scheduling, routing, and maintenance of long-distance vehicles. They ensure efficient fleet operations and the timely movement of parcels between hubs by managing drivers, optimising routes, and ensuring vehicle readiness.</li></ul> | <b>AI / Digital Skills</b><br><br><b>1. Statistical Analytics</b><br>This skill allows a Fleet Manager to use data for strategic decisions, such as optimising delivery routes, predicting vehicle maintenance needs, and assessing driver performance. By analysing data, they can enhance operational efficiency and reduce costs.<br><br><b>Green Skills</b><br><br><b>1. Sustainable Transportation Management</b><br>This skill involves managing green vehicle fleets, like EVs, and streamlining routing to reduce carbon footprints. It helps Fleet Managers maximise operational efficiency while meeting an organisation’s sustainability goals. |



Case Study

The Rise of the Data-Driven Fleet Manager

The role of a Fleet Manager is rapidly evolving from manual oversight to data-driven decision-making, as demonstrated by global leaders like UPS and local players such as Pos Malaysia.

UPS has adopted AI-powered route optimisation to calculate the most efficient routes for its multiple stops. This allows Fleet Managers to dynamically adjust routes in real-time, keeping both drivers and customers informed. Simultaneously, Pos Malaysia partnered with Minfy and AWS to modernise its Estimated Time of Arrival (ETA) prediction system. This has not only improved delivery accuracy but has also automated tasks such as real-time tracking and predictive maintenance, allowing for more precise fleet scheduling.

These advancements show how technology is fundamentally changing fleet management, prompting managers to upskill in AI, real-time data, and automation. By embracing these digital skills, they can optimise operations, reduce costs, and significantly enhance customer satisfaction in an increasingly competitive market.

Low Impacted Roles

Approximately 23% of roles within the Postal and Courier sector are classified as low impacted roles in relation to current technological advancements. This is primarily due to their inherently hands-on nature, which necessitates significant manual intervention and on-site expertise. While these roles currently experience minimal disruption from trends in AI, Digital, and Green Economy, professionals in these positions should nonetheless remain proactive in skill development. This will ensure they maintain relevance and can adapt effectively to the sector's evolving landscape as technology continues to advance. Low-impact roles remain essential due to their reliance on physical presence, complex problem-solving and emotional intelligence that current technology cannot fully replicate.

On-Demand Skills Analysis for 12 Low Impacted Roles

| Job Clusters                  | Low Impacted Roles                                                                                                                                           | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Collection and Pick-Up</b> | <ul style="list-style-type: none"><li>Mail &amp; Parcel Collection Personnel</li></ul>                                                                       | <b>Specific Skills</b> <ul style="list-style-type: none"><li>Credit and Collections Management</li><li>Customer Relationship Management</li><li>Database Management</li><li>Delivery Management</li><li>Documentation Management and Control</li></ul> <b>Additional Skills</b> <ul style="list-style-type: none"><li>Environmental Awareness</li><li>Sustainable Business Practices</li><li>Sustainable Transportation Management</li></ul>                   |
| <b>Delivery Services</b>      | <ul style="list-style-type: none"><li>Regional Manager</li><li>Branch Head</li><li>Supervisor</li><li>Postman &amp; Courier</li><li>Delivery Agent</li></ul> | <b>Specific Skills</b> <ul style="list-style-type: none"><li>Customer Relationship Management</li><li>Defensive Riding and Driving</li><li>Delivery Management</li><li>Route Planning and Optimisation</li><li>Service Level Management</li></ul> <b>Additional Skills</b> <ul style="list-style-type: none"><li>Database Security</li><li>Carbon Footprint Management</li><li>Supply Chain Sustainability</li><li>Sustainable Facilities Management</li></ul> |

- AI / Digital Skills
- Green Skills



- AI / Digital Skills
- Green Skills

Example: Illustration of Low Impacted Roles

Low impacted Role #01

Delivery Services: Postman & Courier

Roles

Postman & Courier

**Job Purpose:**

- A Postman and Courier is responsible for ensuring the accurate and timely delivery of e-commerce parcels. They execute last-mile delivery operations efficiently by leveraging digital tools for route optimisation, real-time tracking, and customer communication.

Additional Skills

AI / Digital Skills

**1. Mobile Device Management**

This skill supports the administration and optimisation of mobile platforms used by customers and field teams, ensuring functionality and a smooth user experience.

Green Skills

**1. Carbon Footprint Management**

Understanding how to measure and reduce carbon output through route efficiency, vehicle choice, and delivery practices aligns the role with broader ESG goals.

**Case Study**

**Royal Mail and the Resilient Postman**

Royal Mail is undergoing a significant transformation, driven by automation and a strategic shift from letter-based mail to parcel delivery. The company has invested heavily in automated sorting facilities, AI-driven logistics systems, and digital tracking tools to improve efficiency and reduce operational costs.

Despite these advancements, the role of a postman or courier remains essential, as the last mile of delivery cannot be fully automated. The success of this final stage relies heavily on human capabilities that technology cannot yet replicate. Couriers are required to:

- Navigate complex routes, especially in rural or high-density urban areas.
- Handle crucial customer interactions, which includes ensuring secure handovers and following special delivery instructions.
- Adapt to real-time changes such as traffic disruptions, unexpected weather conditions, or missed deliveries.

This reliance on human problem-solving, emotional intelligence, and on-the-ground presence ensures that this role will remain vital to the sector's success for the foreseeable future.

284 Communications & Multimedia: Telecommunications, Broadcasting, and Postal and Courier

Communications & Multimedia: Telecommunications, Broadcasting, and Postal and Courier 285



Low impacted Role

#02

International / Cross-Border Operations: Operations Manager

| Roles                                                                                                                                                                                                                                                                                                                                   | Additional Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operations Manager</b><br><br><b>Job Purpose:</b> <ul style="list-style-type: none"><li>Responsible for leading and managing international and cross-border logistics operations. This includes coordinating strategic initiatives, ensuring regulatory compliance, and optimising the movement of parcels across borders.</li></ul> | <b>AI / Digital Skills</b><br><br><b>1. Artificial Intelligence Ethics and Governance</b><br>This skill is vital for understanding how to ensure the ethical use of AI, particularly in how it processes personal data in compliance with privacy laws. It enables managers to contribute effectively to AI policy development and risk assessments.<br><br><b>Green Skills</b><br><br><b>1. Supply Chain Sustainability</b><br>This skill involves understanding carbon accounting, green supply chain practices, and eco-friendly packaging and transport options. It prepares the organisation for future regulatory shifts in green logistics. |



Case Study

The Human Element in Cross-Border Logistics

While AI tools can automate tasks like anomaly detection, documentation, and flagging compliance risks, the core of cross-border operations remains a human-led activity. The role of an Operations Manager requires a unique blend of expertise that current technology cannot fully replicate.

As demonstrated by companies like DHL, whose exploration of data protection in logistics reinforces the regulatory complexity of the sector, human oversight is crucial to ensure that international parcel flows comply with diverse legal frameworks. An Operations Manager is essential for:

- Interpreting complex international laws and trade agreements.
- Negotiating directly with customs authorities and other stakeholders.
- Aligning strategies across multiple jurisdictions to ensure a seamless service.

These functions require a high degree of emotional intelligence, diplomacy, and complex decision-making, which gives the Operations Manager role a low automation potential, ensuring it remains vital to global postal and courier operations.

In-Demand Skills for AI, Digital, and Green Economy

Training Programmes Available

Essential AI and Digital skills for roles to adopt for business operations enhancements and overall workforce productivity improvements.

List of proposed training programmes are accessible on the MyMAHIR platform.

AI/ Digital Skills

Automated System Design

Data Visualisation

Data Protection Management

Data Literacy

Database Security

Network Security

Green skills that are needed for roles to integrate sustainability efforts and initiatives into business operations.

Green Skills

Green Asset Management

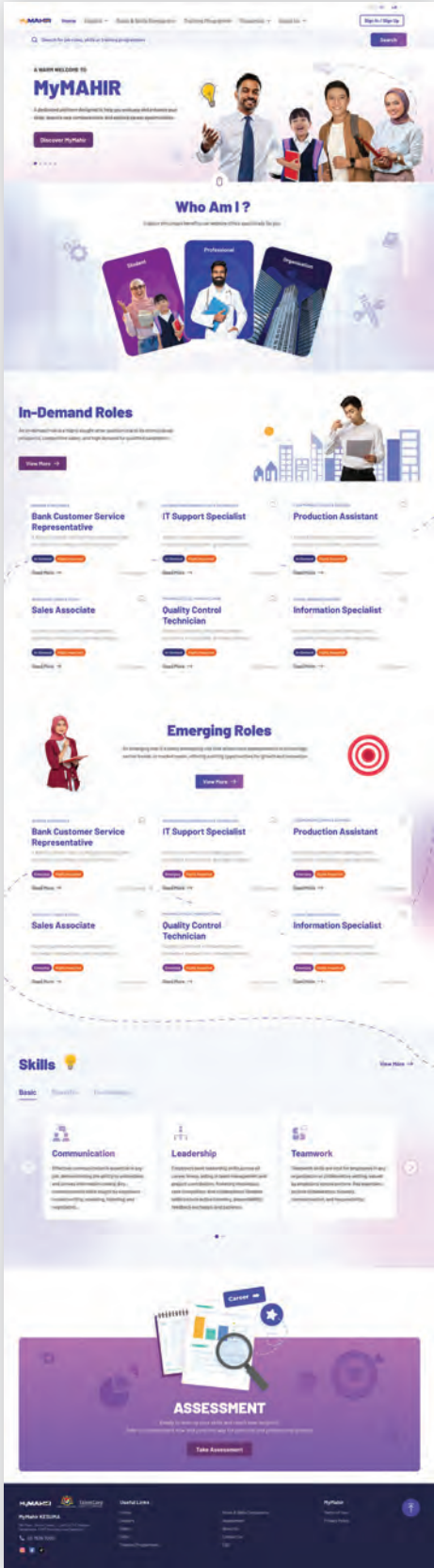
Sustainable Facilities Management

Supply Chain Sustainability

Green IT Practices

Green Business Innovation

Sustainable Transportation Management



# Emerging Roles



Emerging roles in the Postal and Courier sector are driven by the urgent need to leverage advanced technologies to optimise security, enforce compliance, and manage the growing complexity of modern logistics. These roles signify the sector's strategic pivot towards a more technologically advanced and resilient future. The sector is undergoing significant reshaping, fundamentally driven by the rise of e-commerce and the inherent security risks that accompany the rapid adoption of digital logistics.

The urgency of this security requirement is highlighted internationally by the United States Postal Inspection Service (USPIS), the federal law enforcement arm of the US postal system. The USPIS's role has expanded significantly from its traditional function of combating mail theft to now enforcing nearly 200 federal statutes, primarily focusing on modern threats like cybercrime, identity theft, financial fraud, and the interdiction of illegal narcotics sent through the mail, directly protecting the mail system's integrity against misuse.<sup>272</sup>

The emerging role of the Head of Postal Inspectorate is a direct response to these profound changes. The rising complexity of global postal operations has introduced new risks, from contraband trafficking to the exploitation of delivery channels for criminal activities. In Malaysia, to formalise security oversight, MCMC has initiated the development of the Postal Security Rules under Section 101 of the Postal Services Act 2012 (PSA 2012), which necessitates the appointment of this key inspectorate role. The Inspectorate's role is to enforce compliance, monitor parcel handling, and prevent the illegal use of postal networks, responsibilities which were sharply underscored by the recent security concerns, such as the 2024 parcel bomb incident.

This specialist position is envisioned to integrate powerful AI and digital tools directly into its core functions. These include AI-driven threat detection, real-time parcel tracking, and automated identity verification. In an age of digital threats, the Inspectorate must be highly skilled in areas such as cybercrime investigation, digital forensics, and AI-assisted case management. By embedding these capabilities, this new role can reinforce public safety, improve response times to threats, and future-proof Malaysia's courier infrastructure for the long term. This evolution makes the Inspectorate central to driving security, enabling a data-driven approach to risk, and embedding digital resilience directly within core postal workflows.

Overview of One (1) Emerging Role

Head of Postal Inspectorate

- Responsible for investigating postal and courier illegal offences, enforcing regulatory and security compliance, and ensuring the safety and integrity of mail, parcel, personnel, and postal network.

272. United States Postal Inspection Service (USPIS). What We Do. <<https://www.uspis.gov/about/what-we-do>>

Emerging Roles

#01

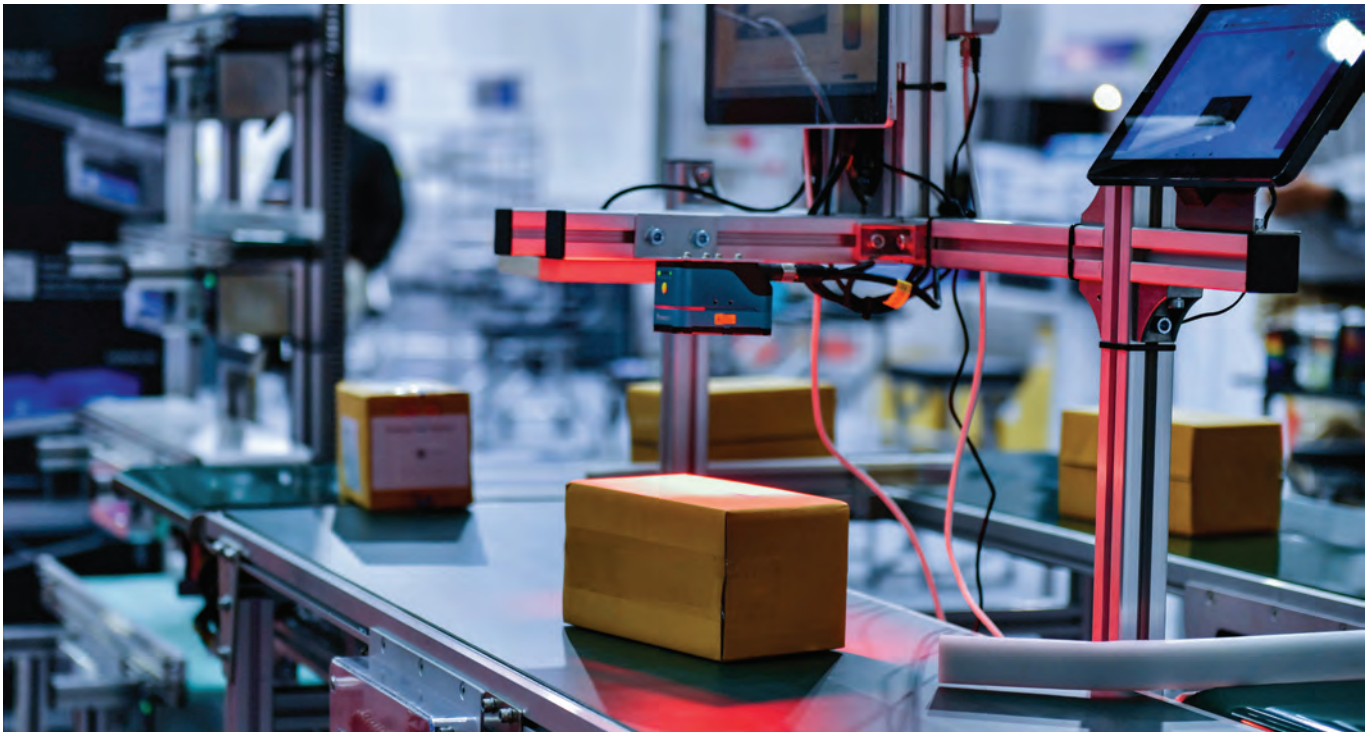
Head of Postal Inspectorate

Based on global trends, the emerging role of a Head of Postal Inspectorate is being fundamentally shaped by advancements in AI and digital technologies. This position is a direct response to the rising complexity and security risks associated with the rapid growth of e-commerce.

| Global Emerging Trends                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Key Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Skills                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>AI:</b></p> <p>AI is at the forefront of modern postal security, enabling a shift from reactive to proactive risk management. For a Head of Postal Inspectorate, this means:</p> <ul style="list-style-type: none"><li><b>Predictive Risk Assessment:</b> AI and machine learning algorithms are being used to analyse vast amounts of data, including shipping details, sender information, and origin countries, to identify high-risk shipments and detect patterns associated with fraud, contraband, or security threats before they enter the supply chain. This allows for targeted interventions rather than relying on random checks.</li><li><b>Computer Vision and Anomaly Detection:</b> At sorting facilities, AI-powered systems can use computer vision to scan parcels and automatically detect anomalies or suspicious objects (e.g: weapons, explosives, or illegal substances) in real-time, greatly enhancing the capabilities of traditional X-ray scanners.</li><li><b>Adversarial AI Preparedness:</b> As cybercriminals increasingly use AI to create sophisticated phishing attacks and scams, the Inspectorate must also be skilled in using AI to defend against these threats and secure the supply chain's digital infrastructure.</li></ul> | <ul style="list-style-type: none"><li>Ensure compliance with security requirements on its postal network facility.</li><li>Shall attend the trainings and programmes conducted by the relevant authorities as required from time to time.</li><li>Investigate crimes involving misuse of the postal system, such as mail fraud, theft, drug trafficking, identity theft, and online scams.</li><li>Exercise authority to arrest suspects, carry firearms, and execute search warrants to enforce federal laws related to the mail.</li></ul> | <p><b>Basic Skills</b></p> <ul style="list-style-type: none"><li>Adaptability and Resiliency</li><li>Business Acumen</li><li>Change Management</li><li>Cognitive Skills</li><li>Critical Thinking</li><li>Digital and AI Fluency</li><li>Innovative Thinking</li><li>Learning Agility</li><li>Planning and Organising</li><li>Sustainability Awareness</li><li>Coaching and Mentoring</li><li>Communication</li><li>Conflict Management</li><li>Empathy</li><li>Influencing and Negotiation</li><li>Teamwork and Collaboration</li></ul> <p><b>Specific Skills</b></p> <ul style="list-style-type: none"><li>Policy Study</li><li>Occupational Safety and Health</li><li>Regulatory Compliance</li><li>Digital forensics and evidence recovery</li><li>Postal Experience</li><li>Postal Security and Logistics Breach</li><li>Cross border inspection and security skill</li></ul> |



| Emerging Roles #01 Head of Postal Inspectorate (Continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Global Emerging Trends                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Key Activities                                                                                                                                                                                                                                                                                                                                                                                                                                             | Skills |
| <p><b>Digital:</b></p> <p>Digital transformation provides the foundational infrastructure for AI to operate and enables a new level of transparency and collaboration in global logistics. The Head of Postal Inspectorate role is leveraging:</p> <ul style="list-style-type: none"><li>• <b>Integrated Digital Platforms:</b> The global push towards "single window" systems and unified digital platforms allows for the seamless exchange of electronic advance data (EAD) between postal operators, customs authorities, and other government agencies. This provides a centralised view of all shipments, improving visibility and speeding up customs clearance for legitimate parcels.</li><li>• <b>Supply Chain Visibility:</b> Technologies such as IoT sensors and GPS-enabled seals offer real-time tracking and monitoring of shipments. A Head of Postal Inspectorate can use this data to detect unauthorised access or tampering and trigger immediate alerts for intervention.</li><li>• <b>Blockchain for Transparency:</b> Blockchain technology is being explored to create a secure, tamper-proof record of a parcel's journey. This decentralised ledger can enhance the traceability of high-value or regulated goods, reducing the risk of forgery or fraud throughout the supply chain.</li></ul> | <ul style="list-style-type: none"><li>• Ensure the safety of postal facilities, employees, and mail, including handling threats such as suspicious packages or emergencies.</li><li>• Conduct awareness campaigns and provide information to help the public avoid scams and safeguard personal information.</li><li>• Prepare case reports and provide testimony in court to support legal proceedings against individuals who misuse the mail.</li></ul> |        |



Case Studies

The Digital Transformation of Postal Law Enforcement

The USPIS is a unique law enforcement agency with a mission to secure the nation's mail system. Its Postal Inspectors are federal law enforcement officers who are authorised to enforce over 200 federal statutes, investigating serious crimes such as mail fraud, identity theft, drug trafficking, and hazardous mail threats. With the authority to conduct surveillance, execute search warrants, and make arrests, they are at the forefront of tackling cross-border crimes and ensuring the safety of postal employees and the public. In parallel, the USPIS also manages a range of technical and public safety functions, from cybercrime investigations to emergency threat response.<sup>273</sup>

In recent years, the USPIS has strategically embraced advanced technologies to combat the evolving nature of crime. By integrating sophisticated analytics, digital forensics, and surveillance systems, the agency is now better equipped to address modern security challenges like mail theft and check fraud. Programmes such as Project Safe Delivery leverage real-time tracking and predictive analytics to pinpoint threats. Furthermore, the agency has forged key partnerships, including with the American Bankers Association, to support technology-based fraud detection across postal and banking networks.<sup>274</sup>

This technological integration has significantly enhanced the USPIS's ability to act quickly and effectively. Technology now speeds up evidence processing and improves resource deployment through digital risk mapping. The enhanced integration with broader law enforcement databases also allows for better coordination and response, ultimately reinforcing public trust in the integrity and security of the postal system.<sup>275</sup>

273. United States Postal Inspection Service. (2024, July). FY 2023 Annual Report. <<https://www.uspis.gov/wp-content/uploads/2024/07/ARFY2023-annual-report.pdf>>

274. American Bankers Association. (n.d.). U.S. Postal Inspection Service partnership to combat check fraud. <<https://www.aba.com/about-us/press-room/press-releases/us-postal-inspection-service-partnership-to-combat-check-fraud>>

275. United States Postal Service. (2025, January 23). USPS & Postal Inspection Service highlight success of Project SAFE Delivery [Press release]. <<https://about.usps.com/newsroom/local-releases/ma/2025/0123-usps-postal-inspection-service-highlight-success-of%20project-safe-delivery.htm>>





Chapter 5.3:

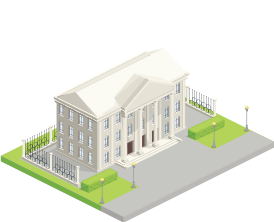
# Recommended Initiatives

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This impact study outlines nine (9) strategic initiatives aimed at addressing the profound effects of AI, Digital, and Green Economy on the Postal and Courier sector. The initiatives are organised by the key entities driving and enabling them: the Government, Industry Players, Academia, and Training Providers. This highlights the need for a collaborative, multi-stakeholder approach that is essential for guiding the sector's ongoing transformation.

Summary of Nine (9) Recommended Initiatives



Government

**IN1**  
Introduce targeted funding schemes to accelerate AI, digital and green transformation

**IN2**  
Empower AI, Digital, and Green Economy literacy and awareness through social media content creator-led ecosystems



Industry Players

**IN3**  
Leverage available financial incentives to invest in AI, digital, and green transformation for long-term operational gains

**IN4**  
Adopt AI-driven network operations and embed sustainability principles into system design and management

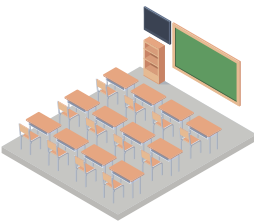
**IN5**  
Foster R&D collaboration with universities to drive innovation in AI, digital, and sustainable network infrastructure



Academia

**IN6**  
Develop a standardised, industry-aligned syllabus to bridge skills gaps in AI, digital and green logistics

**IN7**  
Strengthen industry-academia collaboration to align graduate skills with sector transformation needs



Training Providers

**IN8**  
Expand training capacity to develop local talent for AI, digital, and green transformation

**IN9**  
Introduce subsidised and co-funded training schemes to support workforce upskilling in AI, digital, and green practices

Government

IN1 Introduce targeted funding schemes to accelerate AI, digital and green transformation

This initiative proposes the establishment of targeted financial support mechanisms to reduce the high upfront costs of adopting AI, digital technologies, and green infrastructure. This strategic approach offers incentives and grants to encourage innovation and sustainability-focused investments, especially among SMEs. The blended public-private financing models allow for risk-sharing and attract private capital into these crucial transformation initiatives.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN1.1</b><br/><b>Provide matching grants or subsidies</b> to support the adoption of AI, automation, route optimisation software, EVs, and other green technologies, specifically targeting SMEs.</p> <p><b>IN1.2</b><br/><b>Introduce tax deductions or exemptions</b> for capital investment in low-emission vehicles, renewable energy infrastructure (e.g: solar-powered hubs), and sustainable packaging.</p> <p><b>IN1.3</b><br/><b>Digital Adoption Financing Facility (DAFF)</b><br/>Collaborate with financial institutions to create low-interest loan schemes or credit facilities dedicated to funding digital transformation projects within the sector.</p> <p><b>IN1.4</b><br/><b>National Innovation Fund for Logistics (NIFL)</b><br/>Establish a dedicated innovation fund under the Ministry or a relevant agency to support pilot projects involving AI, data analytics, or green last-mile delivery models.</p> <p><b>IN1.5</b><br/><b>Access to International Climate and Innovation Funds</b><br/>Facilitate access to global green and digital funds (for example the Green Climate Fund or the ASEAN Catalytic Green Finance Facility) through application support, awareness campaigns, and eligibility guidance.</p> | <ul style="list-style-type: none"><li>• <b>Lowering the Barrier to Entry:</b> Grants, tax incentives, and financing options reduce the financial risk for SMEs and large courier firms to adopt new technologies, boosting overall industry efficiency.</li><li>• <b>Promoting Environmental Sustainability:</b> Direct support for electric vehicles, energy-efficient infrastructure, and green last-mile solutions contributes directly to carbon reduction and aligns the sector with national climate goals.</li><li>• <b>Encouraging Innovation:</b> Access to innovation funding incentivises pilot projects and R&amp;D, enabling local companies to develop cutting-edge logistics solutions and remain competitive.</li><li>• <b>Inclusive Growth:</b> Tailored financial support ensures that all industry players can participate in the digital and green transition, fostering a more inclusive ecosystem.</li><li>• <b>Fostering Collaboration:</b> Public-private co-investment models encourage collaboration, knowledge sharing, and joint accountability, leading to more effective and scalable transformation initiatives.</li></ul> |



Case Studies

The Netherlands' Green Deal<sup>276</sup>

The Netherlands' Zero Emission City Logistics (ZECL) and Green Deal initiatives provide a relevant model for Malaysia. The Dutch government partnered with over 75 companies to establish zero-emission zones in urban areas by 2025. This was made possible through a collaborative public-private approach that offered subsidies for electric vans and trucks while simultaneously developing the necessary charging infrastructure.

This model is particularly relevant for Malaysia as it directly addresses key national challenges. Firstly, it places a strong focus on establishing Zero-Emission Zones (ZEZ) in major urban areas, which is a crucial strategy for tackling both air pollution and traffic congestion. Secondly, the model champions Public-Private Collaboration, often referred to as a Green Deal Model, which is essential for equitably sharing the substantial costs and risks associated with the national green transition. Finally, the framework prioritises comprehensive Capacity Building and Awareness Campaigns to ensure all relevant stakeholders are adequately prepared for, and can effectively adapt to, the resulting operational and regulatory changes.

As a result, these efforts have led to significant outcomes, including upskilling in green vehicle operations, new job creation in EV maintenance and support services, and greater inclusion of SMEs and gig workers in formal training programmes.

276. Amsterdam Economic Board. (2019). Green Deal Zero Emission City Logistics (GDZESMRA) initiative. <<https://amsterdameconomicboard.com/en/initiative/green-deal-zero-emission-city-logistics/>>

IN2 Empower AI, Digital, and Green Economy literacy and awareness through social media content creator-led ecosystems

A government-supported scheme is proposed to accelerate public understanding and adoption of AI, digital technologies, and green practices. The scheme would leverage influential social media content creators, providing incentives to generate a vibrant ecosystem of accessible learning resources. This approach delivers information through popular platforms, ensuring individuals can learn at their own pace from a diverse range of voices and presentation styles.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN2.1</b><br/><b>Provide financial incentives</b> to content creators for developing educational materials on AI, Digital and the Green Economy, with a focus on sector-specific needs.</p> <p><b>IN2.2</b><br/><b>Empower creators to publish on platforms</b> where they already have strong engagement, such as YouTube, TikTok, and Instagram, ensuring wide accessibility and reach.</p> <p><b>IN2.3</b><br/><b>Create a centralised online portal</b> that curates and organises content from various creators, making it easier for the public to find trustworthy and relevant learning materials.</p> <p><b>IN2.4</b><br/><b>Host workshops and collaborative labs</b> to equip creators with foundational knowledge in AI, digital systems, and green technologies, ensuring high-quality, relevant content.</p> | <ul style="list-style-type: none"><li>• <b>Broader Public Awareness:</b> Diverse content styles and platforms make learning more relatable and accessible, encouraging more people to engage with new technologies and green practices.</li><li>• <b>On-Demand Learning:</b> Content is available 24/7, supporting self-paced learning and removing barriers related to time, location, or formal education.</li><li>• <b>Viable Career Paths:</b> Increased literacy helps individuals and businesses participate in the growing Digital and Green Economy, fostering innovation and sustainability.</li><li>• <b>Promoting Knowledge-Sharing:</b> Incentivising educational content creation supports the growth of the digital economy and promotes a culture of knowledge-sharing.</li></ul> |

Case Studies

Screen Queensland's 'YouTube Accelerator'<sup>277</sup>

A relevant model for this initiative is Screen Queensland's "Channel Lab: YouTube Accelerator" from the Miles Government. The 16-week programme, delivered with Changer and supported by YouTube, was designed to upskill 20 emerging online creators. It provided them with masterclasses and mentoring to build production capability and audience strategy, helping them produce accessible content on a large scale.

This programme is an excellent example for Malaysia, demonstrating how a government-led initiative can partner with global platforms and industry experts to build a sustainable creator ecosystem and digital skills pipeline. The accelerator expanded inclusive career pathways for youth, regional, and under-represented communities, proving that a targeted approach can effectively raise public literacy and promote digital transformation through an engaging and accessible medium.

277. Screen Queensland. (2024, April 29). Screen Queensland launches new Channel Lab YouTube Accelerator initiative. <<https://screenqueensland.com.au/sq-news/screen-queensland-launches-new-channel-lab-youtube-accelerator-initiative>>



Industry Players

IN3 Leverage available financial incentives to invest in AI, digital, and green transformation for long-term operational gains

Ensuring long-term workforce readiness and operational resilience requires proactive corporate investment in both technology and skills. Companies are urged to leverage government financial support, including grants, subsidies, tax incentives, and low-interest financing, to offset the initial costs of adopting AI, digital systems, and green technologies. Concurrently, firms should prioritise allocating internal training budgets to develop essential employee competencies in these key areas.

| Initiatives                                                                                                                                                                                                                  | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN3.1</b><br><b>Actively pursue government grants, subsidies, and tax exemptions</b> to support investments in AI systems, automation tools, and green infrastructure.                                                    | <ul style="list-style-type: none"><li>• <b>Cost-Effective Adoption:</b> This enables the cost-effective adoption of advanced technologies and sustainable practices, especially for SMEs with limited capital.</li></ul>                                                                                                                                                                                                                                                |
| <b>IN3.2</b><br><b>Collaborate with technology vendors and logistics partners</b> to co-develop and test AI-driven or eco-friendly solutions, sharing both costs and risks through public-private partnerships.              | <ul style="list-style-type: none"><li>• <b>Creating New Job Categories:</b> Investment in digital and green infrastructure will lead to the creation of new job categories such as AI system operators, data analysts, green fleet technicians, and sustainability officers, offering more diverse career paths.</li></ul>                                                                                                                                              |
| <b>IN3.3</b><br><b>Allocate a budget for staff</b> to pursue AI, digital, and sustainability training based on company needs or individual learning preferences, supported by micro-credentials or modular learning formats. | <ul style="list-style-type: none"><li>• <b>Enhanced Workplace Safety and Productivity:</b> Automation and AI tools can reduce manual workload and human error, lowering the risk of accidents and fatigue among frontline staff while improving overall productivity.</li><li>• <b>Improved Work Environment:</b> Green initiatives, such as eco-friendly workspaces and reduced reliance on fossil-fuel vehicles, can improve the physical work environment.</li></ul> |

**Case Studies**

**The UK’s Plug-in Grants<sup>278</sup>**

The UK’s Plug-in Truck Grant (PiTG) and Plug-in Van Grant (PiVG) provide a strong example of how government incentives can drive green transformation in the logistics sector. These grants were specifically designed to support courier and logistics companies in transitioning to electric vehicles.

Under the programme, the UK government covers 20% of the purchase price for electric trucks, provided they produce at least 50% less CO<sub>2</sub> emissions than a conventional equivalent and can drive 60+ miles on a single charge. For vans, the government covers 35% of the purchase price. This allows fleet companies to claim between £5,000 to £16,000 for each vehicle purchased, significantly reducing the cost of adopting electric fleets.

This initiative is a powerful model for driving sustainability within the sector. By reducing the financial barrier to entry, it enables postal and courier companies to lower their carbon emissions while simultaneously helping workers gain new competencies in AI, robotics, and digital logistics management.

278. FleetNews. (2023, March 9). Tevva 7.5t electric truck qualifies for plug-in truck grant. <<https://www.fleetnews.co.uk/news/truck-news/2023/03/09/tevva-75t-electric-truck-qualifies-for-plug-in-truck-grant>>

IN4 Adopt AI-driven network operations and embed sustainability principles into system design and management

To build intelligent, low-carbon digital infrastructure, a dual-focused strategy is essential. This requires sector players to fully integrate AI and machine learning throughout all network operations while embedding sustainability principles into core system design and management. The combined outcome will be significant gains in operational efficiency, reduced energy consumption, and an accelerated transition for the sector.

| Initiatives                                                                                                                                                                                          | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN4.1</b><br><b>Deploy AI and ML</b> to analyse real-time traffic, weather, and delivery data to optimise courier routes, reduce fuel consumption, and lower emissions.                           | <ul style="list-style-type: none"><li>• <b>Improved Workflows and Productivity:</b> Reduces manual workloads, improves task accuracy, and allows workers to focus on higher-value responsibilities such as customer service or system control.</li><li>• <b>Career Advancement:</b> Encourages upskilling and reskilling, opening opportunities for career advancement into tech-driven or supervisory roles.</li><li>• <b>Safer Working Environment:</b> Promotes a safer working environment, especially in sorting hubs and delivery operations.</li><li>• <b>Future-Proofing the Workforce:</b> Helps secure jobs in a future-proof industry while contributing to climate goals and environmental stewardship.</li><li>• <b>Enhanced Job Satisfaction:</b> Reduces stress, minimises last-minute disruptions, and improves job satisfaction through more efficient and predictable workflows.</li></ul> |
| <b>IN4.2</b><br><b>Use ML models</b> to predict wear-and-tear in sorting machines and delivery vehicles, enabling proactive servicing and reducing energy waste and downtime.                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>IN4.3</b><br><b>Implement AI-driven robotic systems and computer vision</b> in sorting hubs to improve speed, accuracy, and energy efficiency in parcel handling operations.                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>IN4.4</b><br><b>Install AI-enabled sensors</b> in facilities and logistics hubs to monitor and optimise electricity usage, lighting, HVAC systems, and machinery in real-time.                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>IN4.5</b><br><b>Utilise AI algorithms</b> to analyse customer behaviour, seasonal trends, and delivery patterns to improve planning, reduce overcapacity, and allocate manpower more sustainably. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Case Studies**

**SingPost and Google Cloud<sup>279</sup>**

SingPost provides a compelling example of an integrated approach to digital and green transformation. Through its partnership with Google Cloud via the AI Trailblazers programme, the company has deployed a range of AI tools to modernise its e-commerce logistics operations. This strategy demonstrates how technology can simultaneously support economic and environmental goals.

By integrating AI at multiple levels, SingPost achieved significant operational gains. The company saw an approximate 30% reduction in IT infrastructure costs by migrating to cloud platforms. It deployed AI chatbots, route planning, and predictive maintenance systems, all of which contributed to improved accuracy, speed, and service reliability. Significantly, these AI tools freed employees from manual data entry tasks, enabling them to shift toward more strategic, customer-facing roles, securing their long-term relevance in a modernised industry.

279. Singapore Post Limited. (2024, August 21). SingPost advances digital innovation in integrated logistics with generative AI. <<https://www.singpost.com/about-us/news-releases/singpost-advances-digital-innovation-integrated-logistics-generative-ai>>

IN5

Foster R&D collaboration with universities to drive innovation in AI, digital, and sustainable network infrastructure

Strategic research and development (R&D) partnerships between industry, universities, and research institutes should be fostered to advance AI-driven network intelligence and sustainable infrastructure. Through joint research projects, living labs, and technology pilots, these collaborations will accelerate innovation in automation and low-carbon connectivity, simultaneously strengthening Malaysia’s research ecosystem and future talent pipeline.

| Initiatives                                                                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN5.1</b><br><b>Establish joint funding schemes</b> to support collaborative research between postal/courier companies and universities, focusing on AI-driven logistics, energy-efficient systems, and carbon reduction strategies.                    | <ul style="list-style-type: none"><li>• <b>Access to Job-Ready Talent:</b> Universities can produce graduates trained in AI, data analytics, and sustainability, giving companies direct access to a talent pool with relevant technical skills.</li></ul>                          |
| <b>IN5.2</b><br><b>Set up dedicated Postal and Logistics Innovation Labs</b> within universities, co-funded by industry and government, to conduct applied research and pilot smart delivery systems, green packaging solutions, and last-mile automation. | <ul style="list-style-type: none"><li>• <b>Upskilling for Existing Employees:</b> Joint curriculum and training programmes allow current employees to upgrade their skills in AI systems, digital tools, and green logistics through micro-credentials and short courses.</li></ul> |
| <b>IN5.3</b><br><b>Collaborate with universities</b> to design short courses, certifications, and micro-credentials aligned with sector needs.                                                                                                             | <ul style="list-style-type: none"><li>• <b>Operational Gains:</b> Research into smart routing, automated sorting, and green packaging can lead to lower fuel usage, faster deliveries, and more efficient last-mile solutions, directly reducing costs.</li></ul>                   |
| <b>IN5.4</b><br><b>Create formal mechanisms for tech transfer,</b> enabling universities to commercialise AI tools, predictive models, or green technologies developed through research in partnership with the sector.                                    | <ul style="list-style-type: none"><li>• <b>Enhanced Public Image:</b> Adopting university-developed sustainable practices and technologies can enhance a company’s public image and help it meet national or global environmental and digitalisation standards.</li></ul>           |

Case Studies

**Academia-Industry R&D in China<sup>280</sup>**

Leading courier companies in China, such as Shentong Express and SF Express, have forged strategic R&D partnerships with top academic institutions such as Shanghai Jiao Tong University and Beijing Jiaotong University. These collaborations focused on applied research in intelligent warehousing, automated distribution, and route optimisation. The universities provided the necessary lab facilities and technical expertise, while the courier companies contributed real-world logistics data and operational scenarios. Crucially, engineering and data science students were engaged in live pilot projects, which later led to internships.

The partnership yielded significant results, including improved operational efficiency through co-developed smart routing and automation tools. Companies were also able to co-own patents, enhancing their technological competitiveness and enabling long-term value creation through proprietary systems. Additionally, existing employees were trained to use the new systems developed through university R&D, leading to greater tech adoption and employee engagement.

280. Bu, F., Tian, X., Sun, L., Zhang, M., Xu, Y., & Guo, Q. (2025). Research on the impact of university–industry collaboration on green innovation of logistics enterprises in China. Sustainability, 17(11), 5068. <<https://doi.org/10.3390/su17115068>>

Academia

IN6

Develop a standardised, industry-aligned syllabus to bridge skills gaps in AI, digital and green logistics

As the Postal and Courier sector undergoes rapid transformation, a growing mismatch exists between workforce capabilities and sector needs. This initiative calls for academic institutions to collaborate with stakeholders to co-develop a unified, future-ready curriculum. The goal is to equip graduates and current employees in operational roles, such as warehouse automation, logistics coordination, and fleet management, with practical, job-relevant skills in robotics, data analytics, and green technologies.

| Initiatives                                                                                                                                                                                                | Benefits                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN6.1</b><br><b>Develop a National Postal and Courier Workforce Curriculum Framework</b> to establish a standardised curriculum that incorporates AI, digital skills, and green technologies.           | <ul style="list-style-type: none"><li>• <b>Bridge Skill Gaps:</b> Establishes a uniform standard across institutions, reducing skill gaps and fragmentation in training.Enhance Quality: Provides quality assurance for training programmes and institutions, ensuring consistency and credibility.</li></ul> |
| <b>IN6.2</b><br><b>Provide quality assurance</b> for training programmes and institutions, ensuring their consistency and credibility.                                                                     | <ul style="list-style-type: none"><li>• <b>Strengthen Relevance:</b> Aligns academic programmes with real-world needs and emerging technologies, making them more relevant.</li></ul>                                                                                                                         |
| <b>IN6.3</b><br><b>Establish collaboration with higher education institutions</b> to develop certified training pathways in smart logistics, data-driven delivery planning, and carbon-neutral operations. | <ul style="list-style-type: none"><li>• <b>Flexible Learning:</b> Allows students to pursue modular and flexible learning paths that are well-suited for the digital era.</li></ul>                                                                                                                           |
| <b>IN6.4</b><br><b>Conduct upskilling programmes</b> for educators and trainers to ensure they are equipped with the latest knowledge and competencies in AI, digital tools, and green logistics.          | <ul style="list-style-type: none"><li>• <b>Educator Proficiency:</b> Ensures educators are technologically proficient and able to deliver up-to-date, relevant content.</li></ul>                                                                                                                             |

Case Studies

**SingPost's 'Future of Work' Programme<sup>281</sup>**

SingPost, Singapore's national postal and courier service provider, launched a structured internal initiative known as the "Future of Work" programme to prepare its workforce for future demands. The training platform was designed to systematically upskill employees in leadership, digital tools, and adaptive capabilities.

The curriculum is built on six core values: Trust, Total Customer, Safety, One Team, Top Execution, and Transformation. This dedicated internal learning institution was designed to equip staff with digital and leadership skills in response to rapid sector changes. The academy's design allows for real-time curriculum updates based on staff feedback, ensuring its relevance and responsiveness to industry demands. This has led to systematic upskilling and a structured learning pathway, with employees becoming more confident to innovate, ask questions, and contribute new ideas.

281. Singapore Post Limited. (2024, April 10). Future-ready: Delivering SingPost’s cultural evolution with our Future of Work Academy. <<https://www.singpost.com/about-us/insights/future-ready-delivering-singposts-cultural-evolution-with-our-future-of-work-academy>>



IN7

Strengthen academic-industry collaboration to align graduate skills with sector transformation needs

This intervention addresses the misalignment between academic programmes and the rapidly evolving skill requirements of the Postal and Courier sector. By facilitating deeper synergies among higher education institutions, vocational training providers, and industry stakeholders, the initiative will ensure the graduate pipeline is equipped with the future-ready technical, digital, and sustainability competencies vital for the sector's transition.

| Initiatives                                                                                                                                                                                                                     | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN7.1</b><br><b>Develop structured on-the-job programmes</b> embedded directly into university or TVET (Technical and Vocational Education and Training) courses, ensuring hands-on experience with real-world technologies. | <ul style="list-style-type: none"><li>• <b>Enhanced Graduate Employability:</b> Provides direct, hands-on experience with real technologies and systems, making graduates more job-ready.</li><li>• <b>Real-World Application:</b> Encourages the application of classroom knowledge to real-world logistics issues and provides companies with fresh ideas.</li><li>• <b>Guaranteed Quality:</b> Aligns student learning outcomes with measurable sector performance metrics, ensuring consistency and quality across internship experiences.</li><li>• <b>Content Relevance:</b> Guarantees that academic and training content reflects current sector standards in AI, digitalisation, and sustainability.</li><li>• <b>Reinforced Collaboration:</b> Fosters a stronger partnership between the education sector and the Postal and Courier sector.</li></ul> |
| <b>IN7.2</b><br><b>Encourage close collaboration between universities and training centres</b> and sector players to co-develop and supervise student-led capstone projects based on real business challenges in the sector.    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>IN7.3</b><br><b>Mandate a standardised internship framework</b> for logistics-related courses, with key performance indicators (KPIs) tied to real industry project exposure.                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>IN7.4</b><br><b>Introduce a national endorsement framework</b> to accredit and approve training programmes in the sector based on their alignment with current and emerging industry needs.                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Case Studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Deutsche Post DHL Group's Training Programme<sup>282</sup></b><br>Deutsche Post DHL Group provides an excellent example of a successful, large-scale vocational training programme that bridges the gap between academic learning and sector demands. As one of the world's largest logistics and courier companies, it operates Germany's most extensive vocational training programme in the sector.<br><br>The programme offers training in more than 20 vocational occupations, including specialists for mail and parcel delivery. It also provides 16 dual-study programmes that combine an academic degree with in-company training in fields. These programmes feature integrated career progression pathways with good prospects for permanent employment upon completion.<br><br>The programme's success is evident in its numbers, attracting approximately 32,000 applications for just 2,000 training places. It is widely described as offering an "ideal start in the working world" effectively supporting career entry and development. |

282. Deutsche Post DHL Group. (2019, December 11). DHL Group strengthens vocational training worldwide. <<https://group.dhl.com/content/dam/deutschepostdh/en/media-relations/press-releases/2019/pr-dpdhl-vocational-training-20191211.pdf>>

Training Providers

IN8

Expand training capacity to develop local talent for AI, digital, and green transformation

This initiative focuses on creating broadcasting-focused training labs equipped with AI and digital tools, providing students with hands-on experience in real media technologies. By fostering collaboration between broadcasters, industry partners, and academic institutions, these labs aim to develop sector-specific AI and digital skills, preparing Malaysia's future media workforce for an AI-enhanced broadcasting landscape.

| Initiatives                                                                                                                                                                                                                                                                                                 | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IN8.1</b><br><b>Design high-impact training content</b> on AI, digitalisation, and sustainability in collaboration with global experts and sector stakeholders. These should be practical, modular programmes tailored to the operational needs of the sector.                                           | <ul style="list-style-type: none"><li>• <b>Global Alignment:</b> Ensures that training materials align with global best practices and current technological trends in postal and courier logistics.</li><li>• <b>National Standards:</b> Establishes a recognised benchmark for trainers nationwide, ensuring consistency and effectiveness in delivery.</li><li>• <b>Educator Empowerment:</b> Empowers educators with current global certifications and exposure to sector trends, enhancing the quality of teaching and training.</li><li>• <b>Programme Relevance:</b> Ensures that academic programmes remain responsive to the evolving technological and environmental needs of the sector.</li></ul> |
| <b>IN8.2</b><br><b>Certify and upskill a national pool of trainers</b> capable of delivering hands-on instruction in AI-based systems, eco-efficient operations, and smart logistics technologies. Trainers should meet industry-recognised standards and possess sector-specific expertise.                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>IN8.3</b><br><b>Offer competitive grants or sponsorships</b> for trainers to pursue international certifications, participate in applied research, or undergo industry immersion programmes. These pathways will enhance instructional quality and ensure alignment with evolving sector practices.      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>IN8.4</b><br><b>Facilitate long-term partnerships</b> between training providers, courier companies, and technology vendors to co-develop training content, deliver joint programmes, and share expertise. This platform should also support internship placements and real-world exposure for trainees. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



Case Studies

La Poste Group's Data and AI School<sup>283</sup>

La Poste Group, France's national postal operator, offers an excellent model for building a future-ready workforce through its Data and AI School. The initiative serves as a talent training programme for both internal staff and external recruits, focusing on AI mail sorting, parcel tracking, route optimisation, automation, and green delivery technologies.

The programme offers qualifying courses that run for three (3) to 12 months, tailored for both internal staff and new recruits. It also fosters a broader developer ecosystem of over 2,000 participants, including developers, startups, and students. By prioritising key technologies such as AI and blockchain, the initiative is actively helping to drive logistics and societal digitalisation.

The initial cohort trained 51 participants, with plans to scale to 250 participants per year over three (3) years. This initiative has been successful in developing operational talent that can contribute to AI-driven logistics and sustainability initiatives while providing La Poste staff with clear career progression paths into new AI and digital roles.

283. La Poste Groupe. (2024, March 8). École de la Data et Master Dev France: La Poste place le numérique au cœur de sa transformation. <<https://www.lapostegroupe.com/fr/actualite/ecole-de-la-data-et-master-dev-france-la-poste-place-le-numerique-au-coeur-de-sa-transformation>>

IN9 Introduce subsidised and co-funded training schemes to support workforce upskilling in AI, digital, and green practices

This intervention proposes the establishment of subsidised and co-funded training schemes to mitigate financial barriers to upskilling within the Postal and Courier sector. Designed to build essential competencies in AI, Digital, and Green Economy practices, the programme will foster strategic partnerships between training agencies, providers, and sector players. A focus on modular and micro-credentialled formats will ensure training is accessible, flexible, and cost-effective, thereby supporting the continuous skill development of both the current and future workforce.

| Initiatives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>IN9.1</b><br/><b>Develop modular micro-credential training</b> to offer a flexible and affordable way for employees to upskill. These short, stackable courses on digital tools, AI, and sustainability can help workers gain relevant skills without the high cost of full certification programmes.</p> <p><b>IN9.2</b><br/><b>Provide government subsidies or grants</b> to support upskilling in AI, digital systems, and green logistics. This is essential for reducing training costs, especially for MSMEs, and enabling broader access to future-relevant skills.</p> <p><b>IN9.3</b><br/><b>Expand training access</b> to rural and semi-urban areas through regional training hubs and mobile learning units, which would minimise travel and accommodation costs for workers.</p> <p><b>IN9.4</b><br/><b>Create an open-access e-learning portal</b> tailored to the Postal and Courier sector to offer affordable, on-demand courses focused on improving operational efficiency, service innovation, and sustainability.</p> | <ul style="list-style-type: none"><li>• <b>Encourages Continuous Learning:</b> Modular formats reduce financial and time barriers, promoting continuous learning without disrupting daily operations.</li><li>• <b>Wider Participation:</b> Subsidies and grants encourage wider participation in upskilling initiatives and lower training costs, particularly for MSMEs.</li><li>• <b>Equitable Workforce Development:</b> Expanding training to rural areas promotes equitable workforce development and reduces logistical burdens for employees in remote regions.</li><li>• <b>Increased Accessibility:</b> An e-learning portal increases accessibility for companies of all sizes, providing a cost-effective solution for upskilling employees at all levels.</li></ul> |

Case Studies

Royal Mail's GetAgile Programme<sup>284</sup>

Royal Mail provides a compelling example of a successful upskilling initiative through its partnership with QA Limited to implement the GetAgile training programme. This initiative was designed to support the company's broader digital and organisational transformation strategy by equipping employees with agile mindsets and role-specific skills.

A tailor-made half-day awareness course was developed and delivered to approximately 255 employees across Royal Mail's technology functions. Through regular reviews and stakeholder feedback, the course was continually refined, ensuring the training remained relevant and effective based on measured outcomes. This programme successfully strengthened internal capabilities and enhanced digital awareness, providing technology and service teams with targeted, practical training pathways for a modernised sector.

284. QA Ltd. (2023). Royal Mail Agile: How QA helped Royal Mail accelerate digital delivery [Case study]. <<https://www.qa.com/resources/case-studies/royal-mail-agile>>



Taking into account the initiatives proposed, moving forward, these are the

**Top 5 Initiatives**

needed to kickstart the workforce transformation towards AI, Digital, and Green Economy to ensure their successful implementation

1 |  GOVERNMENT

**Introduce targeted funding schemes to accelerate AI, digital and green transformation** consists of designing and launching dedicated financial instruments, such as grants or low-interest loans, specifically earmarked for the adoption of key digital and sustainable operational technologies by industry players.

2 |  GOVERNMENT

**Empower AI, Digital, and Green Economy literacy and awareness through social media content creator-led ecosystems** involves creating partnerships with content creators and developing engaging digital campaigns to promote fundamental knowledge and understanding of the digital and sustainable economy to the wider public and internal staff.

3 |  ACADEMIA

**Strengthen academic-industry collaboration to align graduate skills with sector transformation** needs necessitates formalising structured partnerships, joint R&D projects, and industry-mandated curriculum adjustments to ensure educational offerings match current and future workforce requirements.

4 |  TRAINING PROVIDERS

**Expand training capacity to develop local talent for AI, Digital and Green Economy transformation** by systematically upgrading training facilities, certifying expert educators, and deploying high-quality, relevant programmes in logistics and emerging technologies to increase skilled output.

5 |  TRAINING PROVIDERS

**Introduce subsidised and co-funded training schemes to support workforce upskilling in AI, Digital, and Green Economy practices** requires establishing flexible funding mechanisms to offset training costs for employers and individuals, thereby ensuring broad and accessible participation in reskilling programmes.

# Conclusion

The Postal and Courier sector is at a pivotal moment, facing significant transformation driven by AI, Digital, and the Green Economy. This report has detailed a strategic roadmap of nine (9) key initiatives to help the sector navigate this change. The analysis reveals that while the transition presents challenges, it also offers a tremendous opportunity to create a more efficient, resilient, and sustainable ecosystem. The success of these initiatives hinges on the collective efforts of the Government, Industry Players, Academia, and Training Providers. By working collaboratively to invest in technology, foster innovation, and upskill the workforce, the sector can secure its long-term relevance, drive economic growth, and contribute to Malaysia's broader national development goals.

Key trends impacting existing roles:



Artificial Intelligence



Digital



Green Economy



# Conclusion



This impact study provides a comprehensive analysis of the concurrent disruptions brought by AI, Digital, and the Green Economy on Malaysia’s Communications & Multimedia sector. The findings reveal a sector at a pivotal juncture, defined by rapid technological advancement, evolving national priorities, and an urgent need to build a future-ready workforce.

To remain competitive in this changing landscape, the industry must invest strategically in human capital through targeted upskilling and reskilling initiatives, enabling the redesign of roles and the development of new competencies that align with emerging technologies. The convergence of these global forces is fundamentally reshaping the sector’s value chain, creating both transformative opportunities and pressing challenges.

Malaysia has made strong progress in digital infrastructure, supported by initiatives such as JENDELA and one of the region’s most advanced 5G rollouts, alongside ongoing efforts to modernise postal and courier operations through automation, data-driven logistics, and green fleet transitions. In broadcasting, the ongoing digital migration and integration of AI in content creation, distribution, and compliance are redefining how stories are produced and consumed, strengthening Malaysia’s cultural and creative ecosystem. However, persistent challenges remain, including high energy

consumption, skills shortages in emerging fields, rural connectivity gaps, and the financial pressures of network and fleet decarbonisation. Addressing these challenges requires coordinated action across Government, Industry Players, Academia, and Training Providers.

The strategic initiatives proposed in this study outline a collaborative roadmap to empower Malaysia’s Communications & Multimedia workforce. These recommendations advocate for robust talent ecosystems built on industry-academia collaboration, future-focused training programmes, and continuous learning pathways. Together, these efforts aim to ensure that individuals are not merely adapting to disruption but actively shaping the sector’s digital and sustainable future.

Ultimately, navigating this transformation is not just an operational necessity but a strategic national priority. By embracing the recommended initiatives through concerted multi-stakeholder collaboration, anchored by models such as GIAT and platforms like MyMahir, Malaysia’s Communications & Multimedia sector can transform disruption into opportunity. This will strengthen its global competitiveness, reinforce its role as a catalyst for national development, and secure its position at the forefront of a digitally advanced, inclusive, and sustainable Malaysian economy.



# Validation Workshop

## Telecommunications Sector





# Validation Workshop

## Broadcasting Sector





# Validation Workshop

## Postal and Courier Sector





# Abbreviations

| Telecommunications Sector |            | EVCN     | Enterprise Virtual Core Network            | MBH         | Maxis Business Hub                                       | RCA    | Root Cause Analysis                                                         |
|---------------------------|------------|----------|--------------------------------------------|-------------|----------------------------------------------------------|--------|-----------------------------------------------------------------------------|
| 5G-A                      | 5G Advance | FAQ      | Frequently Asked Questions                 | MCMC        | Malaysian Communications and Multimedia Commission       | RedCap | Reduced Capability                                                          |
|                           | AI         | FOIT     | Fibre Optic Installer Technician           | MDEC        | Malaysia Digital Economy Corporation                     | RF     | Radio Frequency                                                             |
|                           | AI-RMAP    | FTTI     | Future Telecommunication Talent Initiative | MetMalaysia | Malaysia Meteorological Department                       | ROI    | Return-on-Investment                                                        |
|                           | API        | FWA      | Fixed Wireless Access                      | Mia         | Maxis Intelligent Assistant                              | RTOS   | Real-Time Operating System                                                  |
|                           | AR         | GDP      | Gross Domestic Product                     | ML          | Machine Learning                                         | SA     | Standalone                                                                  |
|                           | AWS        | GenAI    | Generative AI                              | mmWave      | Millimetre-wave                                          | SDE    | Stanford Digital Education                                                  |
|                           | BA Group   | GLC      | Government Linked Companies                | MNC         | Multinational Corporation                                | SDLC   | Software Development Lifecycle                                              |
|                           | BSS        | GovTech  | Government Technology Agency               | MOE         | Ministry of Education Malaysia                           | SDN    | Software-Defined Networking                                                 |
|                           | BT         | GPUaaS   | Graphic Processing Unit-as-a-Service       | MOSTI       | Ministry of Science, technology, and Innovation Malaysia | SEM    | Search Engine Marketing                                                     |
|                           | CCP        | HPE      | Hewlett Packard Enterprise                 | MoU         | Memorandum of Understanding                              | SEO    | Search Engine Optimisation                                                  |
|                           | CD         | HRD Corp | Human Resource Development Corporation     | MQA         | Malaysian Qualifications Agency                          | SHO    | Safety and Health Officer                                                   |
|                           | CI         | HVAC     | Heating, Ventilating, and Air Conditioning | MQF         | Malaysian Qualifications Framework                       | SIEM   | Security Information and Event Management                                   |
|                           | CIAS       | IaC      | Infrastructure as Code                     | MSME        | Micro, Small, and Medium Enterprises                     | SIT    | Singapore Institute of Technology                                           |
|                           | CLT        | IBS      | Industrialised Building System             | MSP         | Managed Service Providers                                | SME    | Small and Medium Enterprises                                                |
|                           | CMI        | ICT      | Information and Communication Technology   | Naas        | Network as a Service                                     | SOC    | Security Operations Centre                                                  |
|                           | CSM        | IIUM     | International Islamic University Malaysia  | NACSA       | National Cyber Security Agency                           | SON    | Self-Optimising Network                                                     |
|                           | CSON       | IMDA     | Infocomm Media Development Authority       | NETR        | National Energy Transition Roadmap                       | SQL    | Structured Query Language                                                   |
|                           | CSP        | IoT      | Internet of Things                         | NFV         | Network Functions Virtualisation                         | TCP/IP | Transmission Control Protocol / Internet Protocol (Internet Protocol Suite) |
|                           | CSSP       | IT       | Information Technology                     | NOC         | Network Operations Centre                                | Telcom | Telecommunications                                                          |
|                           | CTMO       | JENDELA  | Jalanan Digital Negara                     | NRW         | Non-Revenue Water                                        | TeSA   | Singapore’s TechSkills Accelerator                                          |
| DevOps                    | DAS        | KPI      | Key Performance Indicator                  | NTP-25      | National Telecom Policy                                  | TIPP   | Tech Immersion and Placement Programme                                      |
|                           | DNB        | kWp      | kilowatt peak                              | OSS         | Operational Support System                               | TM     | Telekom Malaysia                                                            |
|                           | EMS        | LEO      | Low Earth Orbit                            | PLC         | Public Listed Companies                                  | TTT    | Train-the-Trainer                                                           |
|                           | ERT        | LLC      | Large Local Companies                      | QA          | Quality Assurance                                        | TVET   | Technical and Vocational Education Training                                 |
|                           | ESG        | LLN      | Living Lab Network                         | QoS         | Quality of Service                                       | U.S.   | United States of America                                                    |
|                           | EV         | LTE      | Long Term Evolution                        | R&D         | Research and Development                                 | UC     | Unified Communication                                                       |
|                           |            | M&E      | Mechanical and Electrical                  | RAG         | Retrieval-Augmented Generation                           |        |                                                                             |
|                           |            |          |                                            | RAN         | Radio Access Network                                     |        |                                                                             |
|                           |            |          |                                            |             |                                                          |        |                                                                             |
|                           |            |          |                                            |             |                                                          |        |                                                                             |



## Abbreviations (Continued)

|                     |                                                 |                           |                                                    |           |                                                    |          |                                                 |
|---------------------|-------------------------------------------------|---------------------------|----------------------------------------------------|-----------|----------------------------------------------------|----------|-------------------------------------------------|
| UI                  | User Interface                                  | JENDELA                   | Jalanan Digital Negara                             | AI        | Artificial Intelligence                            | PiTG     | UK's Plug-in Truck Grant                        |
| UiTM                | Universiti Teknologi MARA                       | KPI                       | Key Performance Indicator                          | AMRs      | Autonomous Mobile Robots                           | PiVG     | UK's Plug-in Van Grant                          |
| UMT                 | Universiti Malaysia Terengganu                  | LLM                       | Large Language Model                               | CAGR      | Compound Annual Growth Rate                        | PSA 2012 | Postal Services Act 2012                        |
| UNIMAP              | Universiti Malaysia Perlis                      | ML                        | Machine Learning                                   | CEP       | Courier, Express, and Parcel                       | PUDO     | Pick-Up Drop-Off                                |
| UTES                | Union of Telecoms Employees of Singapore        | MLEP                      | Machine Learning Engine Principles                 | CRM       | Customer Relationship Management                   | QoS      | Quality of service                              |
| UTHM                | Universiti Tun Hussein Onn Malaysia             | MDEC                      | Malaysia Digital Economy Corporation               | DAFF      | Digital Adoption Financing Facility                | R&D      | Research and Development                        |
|                     |                                                 | MCMC                      | Malaysian Communications and Multimedia Commission | DGFF      | DHL Global Forwarding                              | RAG      | Retrieval-Augmented Generation                  |
| UX                  | User Experience                                 | NAIO                      | National Artificial Intelligence Office            | EAD       | Electronic Advance Data                            | RCA      | Root Cause Analysis                             |
| VR                  | Virtual Reality                                 |                           |                                                    | NLP       | Natural Language Processing                        | ESG      | Environmental, Social, and Governance           |
| Broadcasting Sector |                                                 | OB                        | Outside Broadcast                                  | ETA       | Estimated Time of Arrival                          | RMKe-12  | Twelfth Malaysia Plan                           |
|                     |                                                 | OTT                       | Over-The-Top                                       | EVs       | Electric Vehicles                                  | RPA      | Robotic Process Automation                      |
|                     |                                                 | RTM                       | Radio Televisyen Malaysia                          | GenAI     | Generative AI                                      | SDLC     | Software Development Lifecycle                  |
| ACMV                | Air Conditioning and Mechanical Ventilation     | R&D                       | Research and Development                           | GHG       | Greenhouse Gas                                     | SMMS     | Sustainability Measurement & Management System  |
| AH+                 | AlHijrah Plus                                   | SEO                       | Search Engine Optimisation                         | HSE       | Health, Safety, and Environment                    | SRM      | Supplier Relationship Management                |
| AWS                 | Amazon Web Services                             | SOP                       | Standard Operating Procedure                       | IoT       | Internet of Things                                 |          |                                                 |
| AI                  | Artificial Intelligence                         | SDGs                      | Sustainable Development Goals                      | KPIs      | Key Performance Indicators                         | TVET     | Technical and Vocational Education and Training |
| AR                  | Augmented Reality                               | TVET                      | Technical and Vocational Education and Training    | LLMs      | Large Language Models                              | UI/UX    | User Interface and User Experience              |
| CAGR                | Compound Annual Growth Rate                     | MTSFB                     | The Malaysian Technical Standards Forum Bhd        | MCMC      | Malaysian Communications and Multimedia Commission | USPIS    | United States Postal Inspection Service         |
| FTMA                | Flexible Talent Mobility Account                |                           |                                                    | USPS      | United States Postal Services                      |          |                                                 |
| FTA                 | Free-to-air                                     | UKRI                      | UK Research & Innovation                           | ML        | Machine Learning                                   | WMS      | Warehouse Management Systems                    |
| GIAT                | Government-Industry-Academia-Training Providers | UniSZA                    | Universiti Sultan Zainal Abidin                    | MoUs      | Memorandums of Understanding                       | ZECL     | Netherlands' Zero Emission City Logistics       |
| GDP                 | Gross Domestic Product                          | UX                        | User Experience                                    | MSMEs     | Micro, Small, and Medium-sized Enterprises         | ZEZ      | Zero-Emission Zones                             |
| HVAC                | Heating, Ventilation, and Air Conditioning      | UI/UX                     | User Interface and User Experience                 | NESR 2.0  | National E-Commerce Strategic Roadmap 2.0          |          |                                                 |
| HKTV                | Hong Kong Television Network Limited            | UGC                       | User-generated Content                             | NIFL      | National Innovation Fund for Logistics             |          |                                                 |
| HbbTV               | Hybrid Broadcast Broadband                      | VoD                       | Video-on-Demand                                    | NIMP 2030 | New Industrial Master Plan 2030                    |          |                                                 |
| IP                  | Intellectual Property                           |                           |                                                    | NPCIL     | National Postal and Courier Industry Lab's         |          |                                                 |
| MyIPO               | Intellectual Property Corporation of Malaysia   | Postal and Courier Sector |                                                    | OCR       | Optical Character Recognition                      |          |                                                 |
| IoT                 | Internet-of-Things                              |                           |                                                    | 4R        | Reliability, Reach, Relevance, and Resilience      | PAKEJ    | Pelan Accelerator Kurier Negara                 |

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Radio Televisyen Malaysia  
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