

AI FOR ALL

BUILDING AN AI-READY WORKFORCE IN ASIA-PACIFIC

April 2025



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The AI Opportunity Fund: Asia-Pacific

This report was prepared as part of the AI Opportunity Fund: Asia Pacific, with the support of Google.org and the Asian Development Bank (ADB). The USD 15-million Fund is a three-year programme, launched in May 2024, to equip Asia's workforce with essential artificial intelligence (AI) knowledge and tools required for the evolving work landscape, thereby ensuring that jobs and roles presented by AI are accessible to more people in the region, specifically those from communities with unmet needs. Find out more here: <https://avpn.asia/capital-for-impact/philanthropic-funds/ai-fund/>

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Authored by



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About the Report

This report examines the impact of the AI transition on the workforce across the Asia-Pacific region, focusing on workers, both existing and those preparing to enter the workforce, who can significantly benefit from improved awareness and AI upskilling and reskilling opportunities.

The report identifies communities with unmet needs within the workforce, maps existing skilling programmes, evaluates AI and labour policies, and identifies key gaps in readiness and access. Uncovering these insights highlights opportunities to strengthen skilling pathways and promote greater awareness and accessibility across the region. The report concludes with design principles for effective AI skilling programmes prioritising accessibility, local partnerships, and ongoing support. Through this lens, the report provides actionable insights to inform the development of targeted interventions and foster an AI-driven future which benefits all.

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Executive Summary

The rise of artificial intelligence (AI) is one of the defining global trends of the 21st century.

In the Asia-Pacific (APAC) region, where emerging economies are rapidly adopting AI, the transition holds enormous potential for economic growth—AI is projected to contribute up to USD 3 trillion to the region's GDP by 2030.¹ Given the size of APAC's workforce, already substantial at 2 billion workers as of 2023 and projected to grow by approximately 15 million annually, greater awareness and access to AI upskilling and reskilling opportunities stand to yield significant benefits as we shift to an AI-driven future.²

To address this growing potential, AVPN conducted a comprehensive, multi-language analysis of over 400,000 public resources and surveyed nearly 3,000 end-beneficiaries across eight focus countries and territories. This study is the most expansive AI-powered analysis to date, aimed at understanding the existing AI skilling landscape and identifying key gaps and needs. Leveraging this extensive dataset, the report provides an in-depth analysis of trends, challenges, and opportunities in AI-driven workforce development, outlining a pathway toward an AI Just Transition.

Redefining AI Workforce Development

This study analyses 400,000+ resources and surveyed 3,000 beneficiaries across eight countries—the largest AI-powered analysis yet. The report identifies key gaps and opportunities for an AI Just Transition.

According to the research, at least 160 distinct skills could be transformed by AI, including data entry, compliance monitoring, code writing, and digital marketing. Building capabilities in generative AI, machine learning, and natural language processing can help workers remain relevant in this evolving landscape. Clerical tasks such as data entry, scheduling, and correspondence—primarily associated with administrative and support roles—are the most impacted by AI-driven automation, accounting for over 30% of media discussions on the impact of AI across different professions. With a significant portion of these positions being represented by individuals from communities with unmet needs, there is a crucial need for targeted reskilling initiatives to ensure improved workforce adaptability and access.

1 [Google. AI Opportunity Fund. 2024.](#)

2 [ILO. Asia-Pacific Employment and Social Outlook 2024. 2024.](#)

AI's Impact on the Workforce



Transformation

Sectors Impacted: Retail, Marketing, Finance, Manufacturing, Automotive

Key Points: AI-driven automation could transform these sectors

Benefit: Reskilling provides new skills for the future of work



Adaptation

Human Augmentation: AI systems assist, not replace

Key Points: Improves efficiency, decision-making, and problem-solving

Benefit: Enables complex roles, aids communities with unmet needs



Access

Equitable AI: Inclusive skilling and building anti-bias measures into AI technologies

Key Points: Promotes equal opportunities and diverse group empowerment

Benefit: Leads to just and sustainable growth

Eight distinct groups are poised to benefit most from an AI Just Transition. These include workforce transitioners (e.g. job seekers and recent graduates), low socio-economic groups, workers facing digital barriers and low digital literacy, and the experienced workforce adapting to AI.

Target end-beneficiary survey data revealed a critical need for tailored and accessible AI skilling initiatives that address the diverse needs and concerns of different demographics and sectors.

A total of 2,840 responses were collected, the most extensive survey of its kind, distributed as follows across non-exclusive categories: 51% women, 43% young adults, 18% mature workforce, 16% job seekers, 11% people with low digital literacy, and 5% racial and ethnic minorities.

Young adults entering the workforce show strong enthusiasm for AI skilling, with 1 in 5 survey respondents already participating in related programmes. There is an opportunity to engage this community further, as well as the remaining 4 out of 5 who are not yet fully capitalising on the potential of AI. At the same time, respondents from the mature workforce are 1.6 times more likely to indicate concerns about AI trustworthiness and twice as likely to identify language barriers as a key challenge. This suggests that AI skilling initiatives should be customised to address the unique concerns of different workforce demographics, fostering a more empowered and adaptive workforce for the AI-driven future.

1 in 5 young adults have already participated in AI-skilling programmes





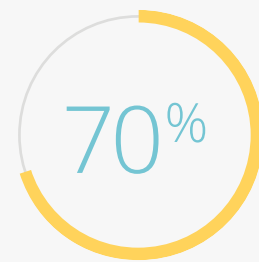
There is a clear link between education level and AI familiarity. Only 23% of respondents with a high school degree or less are familiar with AI and its tools, compared to almost 50% of those with a graduate degree who are familiar or very familiar with AI tools. Across education levels, greater AI familiarity is linked with stronger optimism about its potential to enhance jobs, with 4 in 5 data annotators and software developers—typically holding graduate degrees—expressing optimism about AI’s potential. However, greater AI familiarity also correlates with increased awareness of job displacement risks, with 4 in 5 of the aforementioned workers indicating a high awareness of potential job displacement as a consequence of the AI transition. In contrast, only 2 in 5 skilled tradespersons, such as carpenters, welders, and machinists, show concern about AI replacing their jobs, even as industries increasingly adopt smart manufacturing and automation.



**4 in 5 workers
with higher
education levels
see AI’s potential**

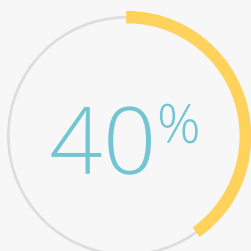


Perceived implications of AI on job performance and displacement vary across sectors, with around 70% of respondents from the education, healthcare and public sectors recognising AI's potential to improve job performance. Respondents from the education sector also showed the highest awareness of AI skilling activities, with 49% knowing about them and 19% participating—the highest rate across all sectors. In contrast, 69% of respondents from the consumer and service-oriented sectors expressed concern about AI-related job displacement. Respondents in healthcare and the public sector showed the least concern about AI replacing jobs, with 41% stating no concern.



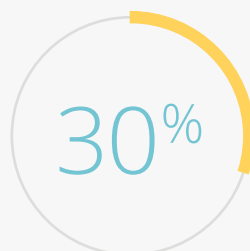
AI at Work

70% of respondents in education, healthcare, and public sectors see AI improving job performance.



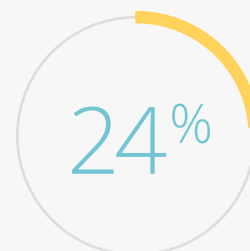
AI Training

40% prefer real-world, contextual AI training over advanced expertise.



AI Knowledge

30% say better understanding is needed to overcome challenges in adopting or utilising AI.



Skill Growth

24% highlight the need for continuous skill development.

Almost 40% of respondents indicated a preference for contextual training with practical, real-world applications over advanced AI expertise. Some challenges faced in adapting to or utilising AI include a need for better AI understanding (30%) and continuous skill development (24%). Prioritising these considerations can ensure that AI skilling initiatives are better designed to effectively equip workers to thrive in an AI-driven workforce, helping them remain relevant and adaptable.

Bridging the AI Skilling Gap



There are approximately 20,000 digital skilling initiatives with AI components, led by nearly 6,000 organisations across Asia-Pacific, reflecting significant efforts by both local and international providers to empower workers for the future. However, only 15% of survey respondents have engaged in AI skilling programmes, with more than half (57%) unaware of their existence. This highlights a significant opportunity to continue expanding access to AI skills training programmes.

Micro, Small and Medium Enterprises (MSMEs), making up 96% of APAC companies, are poised to benefit from an AI Just Transition.³ These MSMEs, which provide employment for 50 to 80% of the local workforce, have the potential to leverage AI to enhance efficiency and drive innovation.⁴ However, many struggle with AI skill development due to limited training accessibility, lack of access to digital infrastructure, and constrained financial resources. These barriers hinder their ability to fully adopt and benefit from AI. Skilling workers and equipping MSMEs to be AI-ready to absorb an AI-equipped workforce will scale the productiveness and competitiveness of MSMEs across the region.⁵

This is why an AI Just Transition is crucial. It means actively addressing skill gaps by providing accessible AI education and training to ensure that all workers are equipped with the necessary knowledge and tools to benefit from an AI-driven future.

3 [AVPN. Strengthening and Scaling Gender Diverse MSMEs in Asia. 2024.](#)

4 [SME Finance Forum, Role of SME's in Asia's Economic Growth, 2022.](#)

5 Ibid.



Building a Pathway to AI Skilling for All

The AI Opportunity Fund: Asia-Pacific emerges as a timely solution, given the unique and evolving dynamics of this region.⁶ It endeavours to maximise the opportunities for economic growth and workforce transformation presented by AI by partnering with nearly 60 local organisations to deliver AI skilling that is needs-based, context-sensitive, and accessible to 500,000 workers. By surfacing timely insights and enabling close collaboration with various stakeholders, AVPN aims to ensure that all workers, including those in MSMEs, can fully participate in an AI Just Transition.

This report explores AI's transformative potential and its impact on the workforce in APAC to better inform AI-skilling initiatives in the region by:

- Analysing how AI is reimagining essential skills and reconstituting tasks and roles through three lenses: Transformation, Adaptation and Access, it surfaces eight essential skilling clusters. These clusters emerge as crucial prospects for targeted skilling initiatives so that all workers can benefit from AI-driven opportunities.
- Surfacing case studies on targeted and effective AI-skilling initiatives by analysing available digital skilling initiatives with AI components.
- Exploring the AI landscape in eight key countries and territories in the region—Australia, India, Indonesia, Japan, South Korea, Singapore, Taiwan, and Vietnam—to underscore the need for market-specific strategies to maximise the impact of AI skilling initiatives.
- Surfacing target end-beneficiary perspectives on navigating the evolving AI landscape.
- Drawing out seven design principles by analysing AI skilling best-practice case studies. These include ensuring access, being targeted, measuring outcomes, fostering job readiness, including an ethical lens, enabling continuity and leveraging collaboration.

These insights will provide a guide to all stakeholders looking to support an AI-driven future which benefits everyone. The opportunity is immense, and the imperative is clear: *To build a future where AI's transformative power benefits everyone.*

⁶ [Google. AI Opportunity Fund. 2024.](#)

Introduction

THE IMPACT OF AI TRANSITION ON THE FUTURE OF WORK ACROSS ASIA-PACIFIC

Artificial Intelligence (AI) is rapidly transforming the future of work worldwide, with the Asia-Pacific (APAC) region at the forefront of this transformation.

Recent estimates suggest that by 2030, AI's contribution to the region's GDP could be as much as USD 3 trillion,⁷ with integration into sectors such as agriculture, healthcare, manufacturing and education holding the most potential.⁸

It is crucial to consider the implications of this shift for the workforce. In 2023, there were two billion workers in the region, and the number was expected to grow by approximately 15 million annually.⁹ Identifying the scale and depth of AI's influence on skills across sectors and industries will help prepare workers for emerging roles and ensure that skilling efforts align with the demands of an AI-driven future.

By 2030, AI could add USD 3 trillion to GDP, but the key lies in preparing the workforce and bridging digital divides to ensure everyone benefits from this transformation.



⁷ [Google.org-Workforce-AI-Opportunity-Fund](https://www.google.org/Workforce-AI-Opportunity-Fund/).


⁸ [World Economic Forum. AI-driven growth: Navigating the path to new markets. 2024.](https://www.weforum.org/publications/ai-driven-growth-navigating-the-path-to-new-markets-2024/)

⁹ [ILO. Asia-Pacific Employment and Social Outlook 2024. 2024.](https://www.ilo.org/publications/new-issues/asia-pacific-employment-and-social-outlook-2024/)

AI also presents an opportunity to bridge digital divides for the future workforce.¹⁰ Recent data from UNICEF suggests that in East Asia and the Pacific, only about 50% of children and young people under 25 have internet access at home.¹¹ The situation is even more dire in South Asia, where merely 13% benefit from connectivity.¹² Improved access to AI education and training can empower these individuals with the skills and knowledge needed to participate fully in the digital economy.

An AI Just Transition is essential to ensure an AI-powered regional economy that is both fair and accessible to all. It demands that all workers—especially those from communities with unmet needs—are equipped with the necessary knowledge and tools to benefit from AI-driven opportunities. This means actively addressing skill gaps by providing accessible AI education and training to foster workforce participation in emerging AI-powered roles. Integrating AI will require deliberate and large-scale efforts in emerging markets like Vietnam, India, and Indonesia, where labour-intensive sectors are transforming industrial productivity. Initiatives such as Grow with Google, which has trained over 60 million people in the region through targeted digital literacy programmes, have laid the foundation for broader upskilling efforts by governments and other corporations.¹³ Another example is the AI Opportunity Fund: Asia Pacific, launched in May 2024 by AVPN, and supported by Google.org and ADB.¹⁴ This is a three-year, USD 15-million initiative to equip Asia’s workforce with essential AI skills. It focuses on developing a common training framework, a train-the-trainer programme, and fostering dialogue with policymakers, skilling programme delivery partners, and the public to promote an AI-driven future that all can participate in.

The AI Opportunity Fund

 Creating a unified framework to improve training quality

 Empowering educators with train-the-trainer programmes

 Engaging policymakers, partners, and the public in meaningful dialogue

Investing USD 15 million over three years to equip Asia’s workforce with essential AI skills to promote an AI-driven future that all can participate in.



10 [World Economic Forum. It took nearly 4 years to connect a billion people to vital digital services—we must redouble our efforts as the world enters the age of AI, 2024.](#)

11 [UNICEF, Estimating how many children and young people have internet access at home, 2020.](#)

12 [ibid.](#)

13 [Google. Grow with Google. n.d.](#)

14 [Google.org, Google AI Opportunity Fund, 2024.](#)

Adopting an AI Just Transition lens means taking market-specific opportunities into account.

In practical terms, this means that in Taiwan, reskilling programmes need to focus on the manufacturing sector, where automation is extensive.¹⁵ In Australia, AI is being leveraged in healthcare and mining,¹⁶ but more access to training is necessary for rural populations. Across the region, approximately 450 million smallholder farmers are unable to benefit from proven AI-driven insights on critical issues such as plot-level crop management based on weather and soil conditions due to limited awareness. Crop yields could increase by 20–30% with these skills, which is a boon to food security in APAC.¹⁷

There is a significant opportunity to expand workforce training and development to meet growing reskilling needs.¹⁸

However, AI skilling approaches must be tailored to different workforce demographics. For instance, while young workers are actively preparing for the AI transition, with 1 in 5 already participating in AI skilling programmes, mature workers between 50 and 65 are 1.6 times more likely to distrust AI and twice as likely to cite language barriers as a key challenge.¹⁹ Furthermore, 91% of workers are eager to acquire new skills to work with AI, but only 4% of business leaders have implemented workforce training programmes at scale.²⁰ This is despite 96% of them acknowledging the significant impact of generative AI. Workers across the region are eager to build core AI skills such as generative AI and effective prompting, and the potential to bridge existing digital access and skill gaps by extending AI training for all is immense.

This report takes a multifold approach to unpacking the impact of AI on the nature of work.

Through the lenses of Transformation, Adaptation and Access, this report profiles essential skilling clusters across APAC, identifying market-specific challenges in eight countries and territories comprising Australia, India, Indonesia, Japan, South Korea, Singapore, Taiwan and Vietnam. It maps the landscape of skilling initiatives and insights from target end-beneficiaries, showcasing best practices and recommendations for designing skilling initiatives. Highlighting successes and gaps provides a roadmap for skilling that fosters an AI future where everyone has the opportunity to thrive.

15 [Taiwan AI Academy. AI in Taiwan. 2022.](#)

16 [Investing News Network. How are Australian Mining Companies Using AI?. 2023.](#)

17 [ADB, Artificial intelligence: A new driver for inclusive growth and development?, 2024.](#)

18 [United Nations Publication, Asia Pacific Population and Development Report, 2023, 2023.](#)

19 Based on Phase II of the research methodology, where 2,840 people surveyed across the essential skilling clusters and focal markets were asked about the challenges of using AI.

20 [Accenture. Work, workforce, workers Reinvented in the age of generative AI. 2024.](#)

Identifying Key Skilling Opportunities in an AI Just Transition

The AI transition is the ongoing integration of AI across various aspects of our lives and industries, driven by technological advancements such as generative AI, machine learning, and natural language processing. These innovations enable machines to perform tasks once considered uniquely human, transforming how we work and live. This section explores how achieving an AI Just Transition must take into consideration role transformation, adaptive skills and access strategies in building systems that ensure the benefits of AI are maximised and distributed fairly across society.



The New Reality of AI on the Workforce: Transformation, Adaptation, and Access

While AI's impact on the workforce presents significant opportunities for innovation and growth, the interim period of transition is marked by role transformation, skill adaptation and the need for accessible systems, as described in turn as follows:

- **Transformation:** At least 160 distinct skills could be transformed by AI, including data entry, compliance monitoring, code writing, and digital marketing, according to our research, contributing to an increase in new jobs and improved productivity and overall job and customer satisfaction. As AI-driven automation drives a significant shift in the nature of work in consumer-oriented sectors like retail, marketing, and finance, as well as industrial sectors like the manufacturing and automotive sectors, building capabilities in areas such as generative AI, machine learning, and natural language processing is key to helping workers such as those in operational roles in manufacturing processes and warehouse logistics, content creation, and customer service, remain relevant in this evolving landscape. The section below provides a closer examination of the broader skill sets currently adaptable to AI replication.
- **Adaptation:** AI systems present the potential to assist and augment human capabilities, not replace them entirely.²¹ The World Economic Forum estimates that while automation may displace 85 million jobs, it could generate 97 million new roles.²² Upskilling allows workers to learn how to leverage AI technologies to build on their current expertise and improve their efficiency, decision-making, and problem-solving abilities, setting them on the path to take on more complex roles and ensuring they remain relevant in a changing job market. This is particularly relevant for workers in operational, administrative and content-creation roles. For example, AI can aid decision-making in critical areas like healthcare, education, and environmental conservation by analysing massive unstructured datasets (e.g., social media posts and satellite images).

AI helps workers make better decisions in fields like healthcare, education, and conservation.



21 [ILO, Generative AI and Jobs: A global analysis of potential effects on job quantity and quality, 2023.](#)

22 [World Economic Forum. Future of Jobs. 2024.](#)

AI-driven hiring tools eliminate bias in decision-making, prioritising fairness and equity.

- **Access:** Integrating anti-bias features in AI, alongside targeted efforts to provide AI-driven training and reskilling opportunities, is crucial in fostering opportunities for diverse populations. AI has the potential to act as an equaliser by mitigating biases that often hinder fair representation in hiring and career advancement. For example, AI-powered recruitment tools with anti-bias algorithms can help organisations prioritise candidates based on skills and qualifications, ensuring that hiring decisions are more objective and less influenced by unconscious biases. Beyond gender and racial diversity, other communities—including persons with disabilities (PWDs) and the ageing workforce—can benefit from AI-driven learning programmes and job training initiatives customised to their needs. By proactively embedding accessibility into AI design, we can help empower these groups, providing them with the opportunities necessary to succeed in an increasingly digital economy.

The impact of these factors will vary for each worker depending on their sector, role, skills, and socio-economic background. By understanding their specific effects, we can identify the groups that will benefit most from skills development.

How AI is Driving Access in Recruitment and Reskilling

Anti-Bias Features in AI

Anti-bias features in AI recruitment tools help organisations prioritise candidates based on skills and qualifications, reducing unconscious biases.

Diverse Populations

AI acts as an equaliser by mitigating barriers to fair representation and offering opportunities to underrepresented groups.

Training and Accessibility

Custom AI-driven training programmes empower communities like persons with disabilities and the ageing workforce, helping them succeed in the digital economy.

Understanding Workforce Needs

By identifying specific workforce needs, we can focus reskilling initiatives on groups that will benefit the most.



Four Dimensions to Help Identify Essential Skilling Clusters within the Workforce

The **Transformation**, **Adaptation**, and **Access** lenses can be further stratified by sector, role, skill and socio-economic segment. This approach allows for a deeper understanding of the challenges and opportunities within intersections, for example, individuals in administrative roles within the health sector. This facilitates the development of tailored interventions and support systems that address complex workforce realities.

Sectors

AI is already making significant inroads across sectors. This transformation is particularly evident in consumer and service sectors, such as retail, marketing, and finance, where media discussions highlight the potential impact of AI-driven automation on jobs, particularly in areas like customer service, ad targeting, and financial transaction processing roles (see Figure 1).²³ The analysis is corroborated by a 2023 report by Accenture, which suggests that 54% of work in the financial services sector could be automated due to advances in generative AI, with the insurance sector following closely at 48%.²⁴

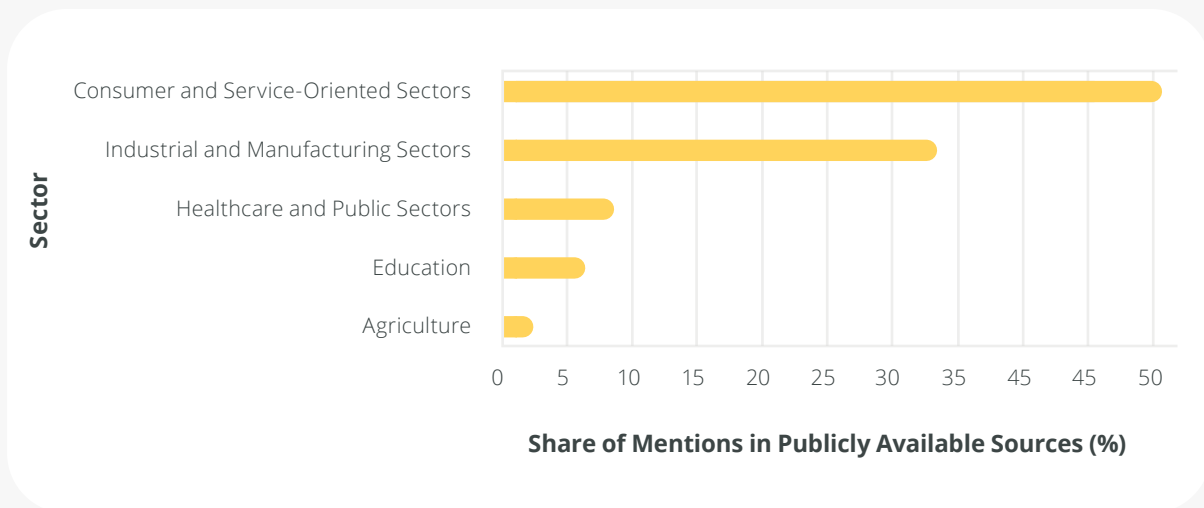


Figure 1: Share of Sectors Mentioned in Publicly Available Resources

23 Based on Phase I of the research methodology which sought to capture mentions across 350,000 news articles in seven different languages (English, Mandarin Chinese, Hindi, Malay, Indonesian, Japanese, and Korean) from the beginning of 2022 to July 2024; 60,000 academic articles; over 350 policy documents; and web content collected through more than 6,000 automated web searches. Consumer and service oriented sectors saw over 50% of mentions identified.

24 [Accenture, 2023, A new era of generative AI for everyone.](#)

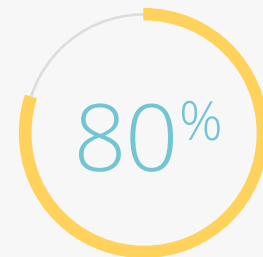


Industrial and manufacturing sectors are also significantly impacted by AI.²⁵ Automotive manufacturers are increasingly employing AI-driven robotic systems on assembly lines. At the same time, in the semiconductor industry, AI is being leveraged to optimise chip design and streamline production processes.

Micro, Small, and Medium Enterprises (MSMEs) are strategically positioned to leverage AI to enhance competitiveness by improving efficiency, streamlining operations, and addressing labour shortages. However, MSMEs often lack the resources and expertise for effective AI adoption. Therefore, sector-specific research and initiatives are crucial to empower them to harness AI's potential, foster innovation, and drive economic growth. With MSMEs comprising 96% of businesses in the APAC region and providing jobs to 50 to 80% of the local workforce, it is crucial that this segment of the industry is effectively included in the AI transition.²⁶

Although public discussions on AI's impact in sectors such as healthcare, public services, education, and agriculture remain relatively limited, these fields are still within its sphere of influence. For example, AI is significantly transforming healthcare by automating diagnostics and streamlining

Reshaping the Global Workforce



AI and automation will impact 80% of global jobs by 2030.

²⁵ As part of Phase I of the research methodology which sought to capture mentions across 350,000 news articles in seven different languages (English, Mandarin Chinese, Hindi, Malay, Indonesian, Japanese, and Korean) from the beginning of 2022 to July 2024; 60,000 academic articles; over 350 policy documents; and web content collected through more than 6,000 automated web searches. Industrial and manufacturing sectors were mentioned in over 35% of mentions identified.

²⁶ AVPN. *Strengthening and Scaling Gender Diverse MSMEs in Asia*. 2024.

patient management, even as ethical and regulatory considerations shape its pace of adoption. Similarly, in education, AI is driving the development of personalised learning platforms and automating administrative tasks, requiring educators to adopt technology-enhanced teaching methods.

Roles

The research suggests that administrative and support roles such as data entry, scheduling and other similar clerical or repetitive functions are evolving the most with AI-driven automation (see Figure 2).²⁷ This presents a key opportunity to support career transitions by focusing on targeted reskilling for groups that are overrepresented in these roles.²⁸ Technical functions like software development and R&D also see the automation of complex tasks that were once solely manual.²⁹ This presents an opportunity for workers to focus on higher-order challenges and cutting-edge advancements with the necessary reskilling and upskilling support. Industrial and blue-collar roles, particularly in manufacturing, have similar potential to engage with advanced technologies, gain new skills, and contribute to more efficient and sustainable production processes.

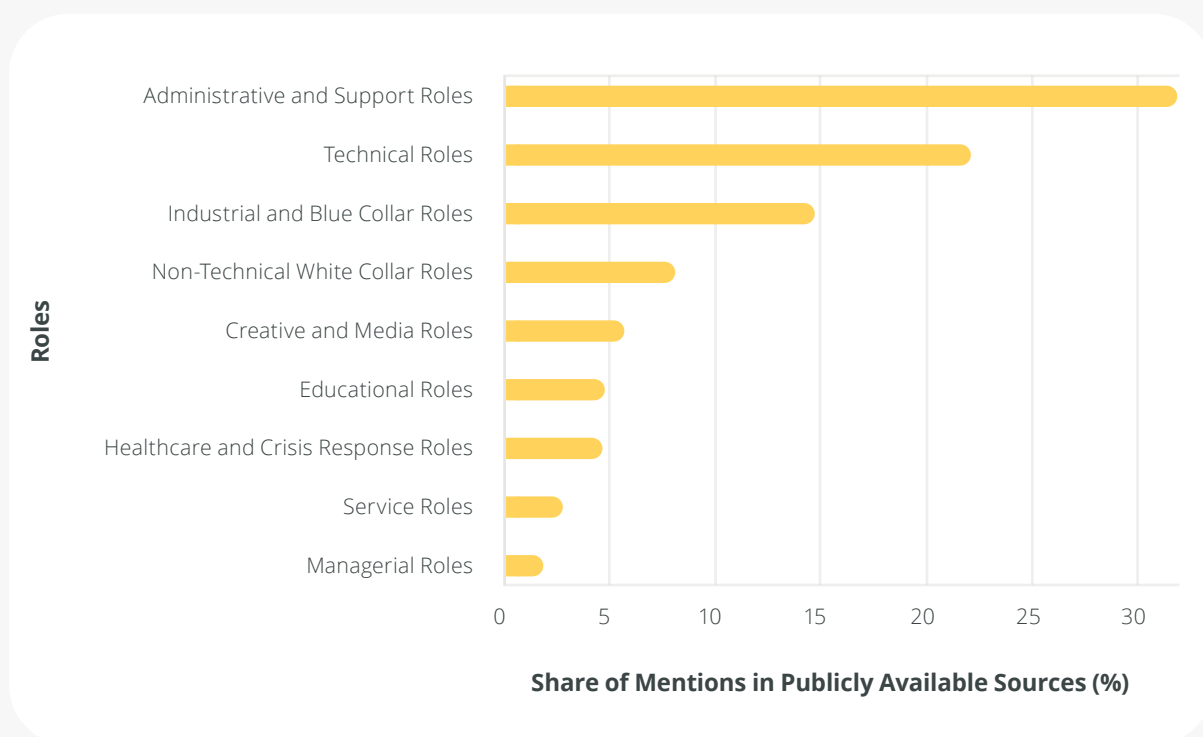


Figure 2: Share of Roles Impacted by AI, as Mentioned in Publicly Available Sources

27 Based on Phase I of the research methodology which sought to capture mentions across news articles, academic articles, policy documents; and web content collected through automated web searches. Vulnerability of administrative and support roles to AI transition saw over 35% of mentions identified.

28 [Generative AI and Jobs: Policies to Manage the Transition | International Labour Organisation](#).

29 Identified as part of Phase I of the research methodology which sought to capture mentions across news articles, academic articles, policy documents; and web content collected through automated web searches.



In the media sector, journalists and content creators are navigating the transformative impact of AI's ability to automate content production, reshaping traditional roles and approaches to creative input. Similarly, in the creative industries, including film and music, AI's capacity to replicate art and performances prompts a reevaluation of workflows and artistic practices. This evolution offers a unique opportunity to redefine roles, embrace innovative methods, and expand the potential for creativity and productivity in these fields.

As AI continues to transform the nature of work, some new roles are expected to emerge. For instance, sectors such as healthcare, where AI enables breakthroughs in diagnosis and drug discovery, may see an increase in openings for consultants and analysts who can manage the technology in medical contexts. Similarly, as AI's influence grows, there will be a heightened need for cybersecurity experts and ethicists to ensure that AI platforms are implemented safely and ethically across various industries.³⁰

AI is transforming industries by automating creativity, reshaping roles in fields like healthcare, and driving demand for cybersecurity experts and ethicists to ensure its ethical and safe application.

³⁰ [Chicago Booth Review, A.I. Is Going to Disrupt the Labor Market. It Doesn't Have to Destroy It, 2023.](#)

Skills

AI is transforming the skills required for effective workforce participation. The study has identified around 160 distinct skills that AI can transform.³¹ These skills can be broadly clustered across four categories along two distinct dimensions (see Figure 3).

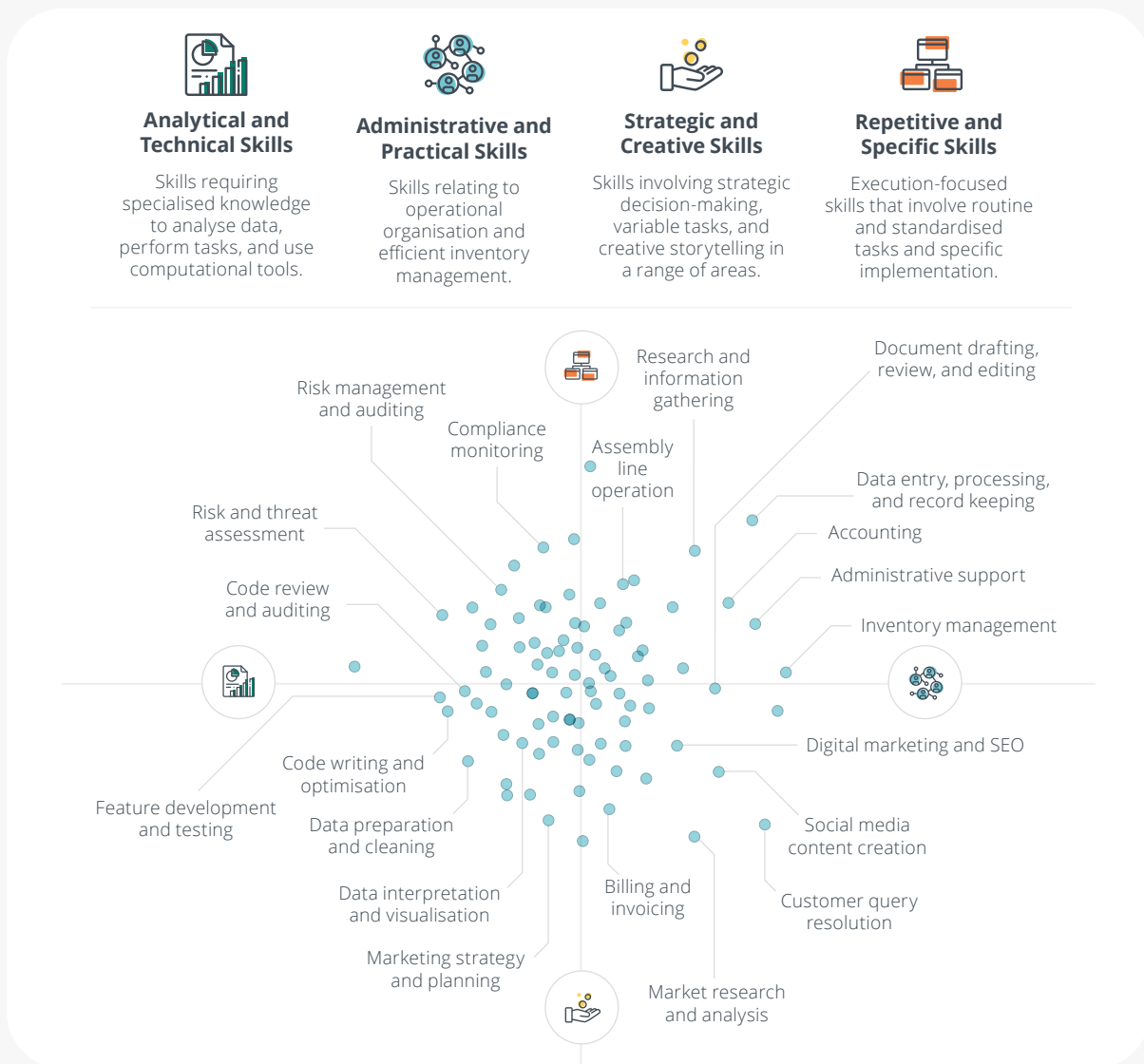


Figure 3: Multidimensional Scaling Visualisation of Skills Across the Dimensions of Skill Type and Skill Innovation

31 Identified as part of Phase I of the research methodology which sought to capture media mentions across news articles, academic articles, policy documents; and web content collected through automated web searches.

Dimension 1: Skill Type

Analytical and Technical Skills vs. Administrative and Practical Skills

Analytical and technical skills require specialised knowledge to analyse data, perform tasks, and use computational tools. Administrative and practical skills, on the other hand, relate to operational organisation and efficient inventory management.

Dimension 2: Skill Innovation

Repetitive and Specific Skills vs. Strategic and Creative Skills

Here, repetitive and specific skills include execution-focused skills that involve routine and standardised tasks and specific implementation. Meanwhile, strategic and creative skills include skills involving strategic decision-making, variable tasks, and creative story-telling in a range of areas.

These dimensions create a “map” illustrating the types of work susceptible to AI automation. Each of the four quadrants corresponds to a type of work (see Figure 4).

- **Technical Rigidity:** This quadrant encompasses jobs requiring highly analytical, technical, repetitive, and specific skills. Examples include researchers and financial analysts.
- **Operational Precision:** This quadrant involves detail-oriented, hands-on, and administrative skills. It includes entry-level administrative roles, logistics workers, and warehouse staff.
- **Innovative Engineering:** This quadrant is associated with jobs that demand technical and open-ended skills. It includes software engineers and game creators.
- **Strategic Facilitation:** This quadrant covers jobs that require creative and administrative skills. Managers and marketing professionals fall into this category.

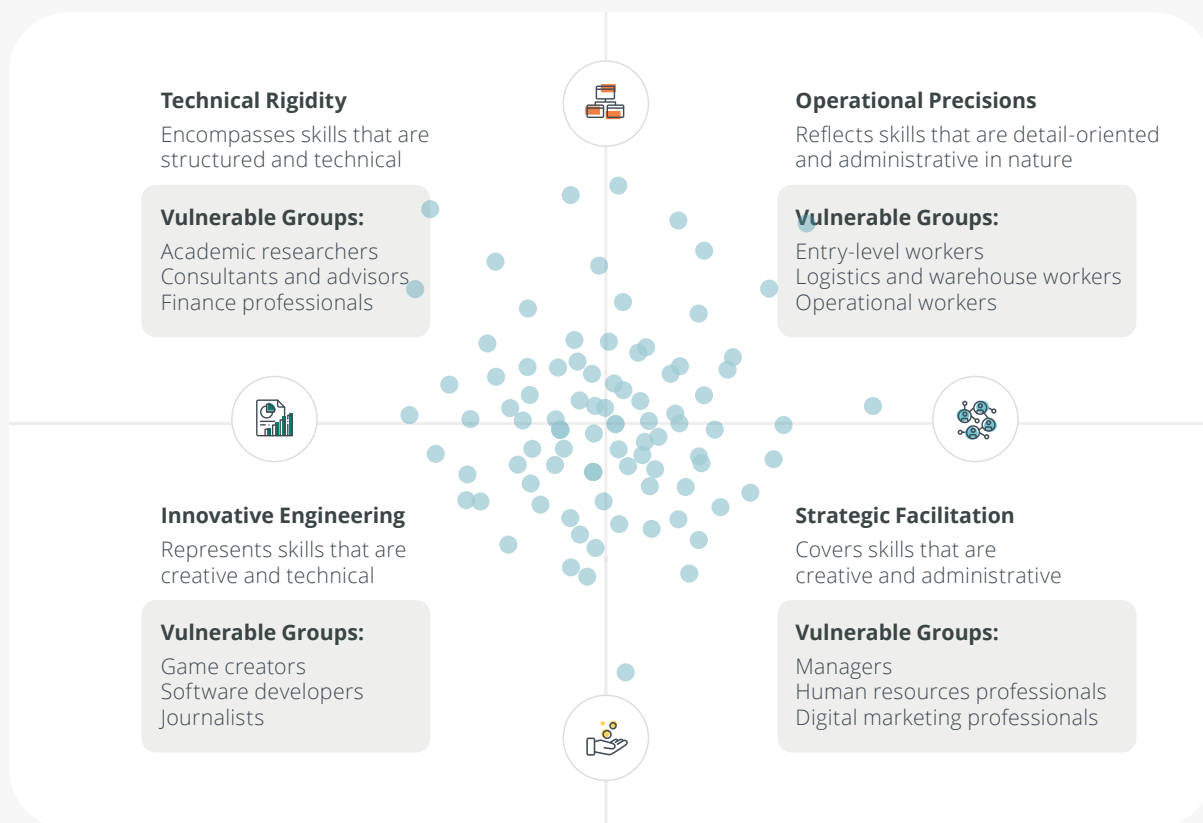


Figure 4: Types of Work Impacted by AI Automation

A deeper investigation into the interrelatedness of the identified skills impacted by AI surfaced 12 distinct skill sets open to automation (see Figure 5). Some of these skill sets are predominantly associated with relatively privileged groups. For these groups, the focus will lie in skills adaptation rather than job transformation, though this is also contingent on the time horizon used and remains a topic of debate.



Figure 5: The 12 Skills Clusters Impacted by the AI Just Transition

The six skill sets where automation could most significantly impact those communities with unmet needs are as follows:

- **Operational Dexterity:** This encompasses hands-on, practical skills related to physical tasks or logistics, such as manual dexterity, equipment operation and maintenance, inventory management, quality control, inspection, and assembly line operations. Groups impacted by AI acquiring these capabilities include vocational training students, informal and unregistered workers, logistics and warehouse workers, operational workers, construction workers, entry-level workers, migrant workers, and service and delivery staff.
- **Routine and Repetitive Tasks:** This skill set is associated with basic organisational workflows and involves tasks like scheduling and time management, data entry and record keeping, administrative support, and customer query resolution. These tasks require consistency and accuracy but offer limited strategic decision-making opportunities. Groups impacted by the automation of these tasks include recent graduates, career changers, people with low digital literacy, women and workers in underprivileged communities.



- **Educational Development and Instructional Design:** This area revolves around education, curriculum design, and the delivery of learning materials. Required skills include instructing, guiding, and creating educational experiences tailored to diverse learner needs. Groups likely to be impacted by AI advancements in this area include students from underprivileged backgrounds, children in underprivileged areas, students more broadly, teachers, and other learning and development professionals.
- **Content Creation and Management:** This includes skills such as content creation, research, information gathering, and basic data analysis. Jobs that could be affected include journalists, content writers, marketing and advertising professionals, and social media content moderators.
- **Human-Centric and Communication-Focused Skills:** Advancements in AI, which centre on human interaction, communication, and team coordination, are poised to influence recruitment processes and support healthcare and service professionals.
- **Design and Creativity:** This includes skills rooted in creativity and visual expression, such as basic graphic design, animation, and scriptwriting. Professionals associated with this skill include artists, designers, gig workers, and freelancers.

Socio-Economic Factors

A socio-economic lens is a necessary complement to the industry and skill-based perspective to ensure an AI Just Transition. Accordingly, this section explores the socio-economic contexts that shape workers' experiences (see Figure 6).

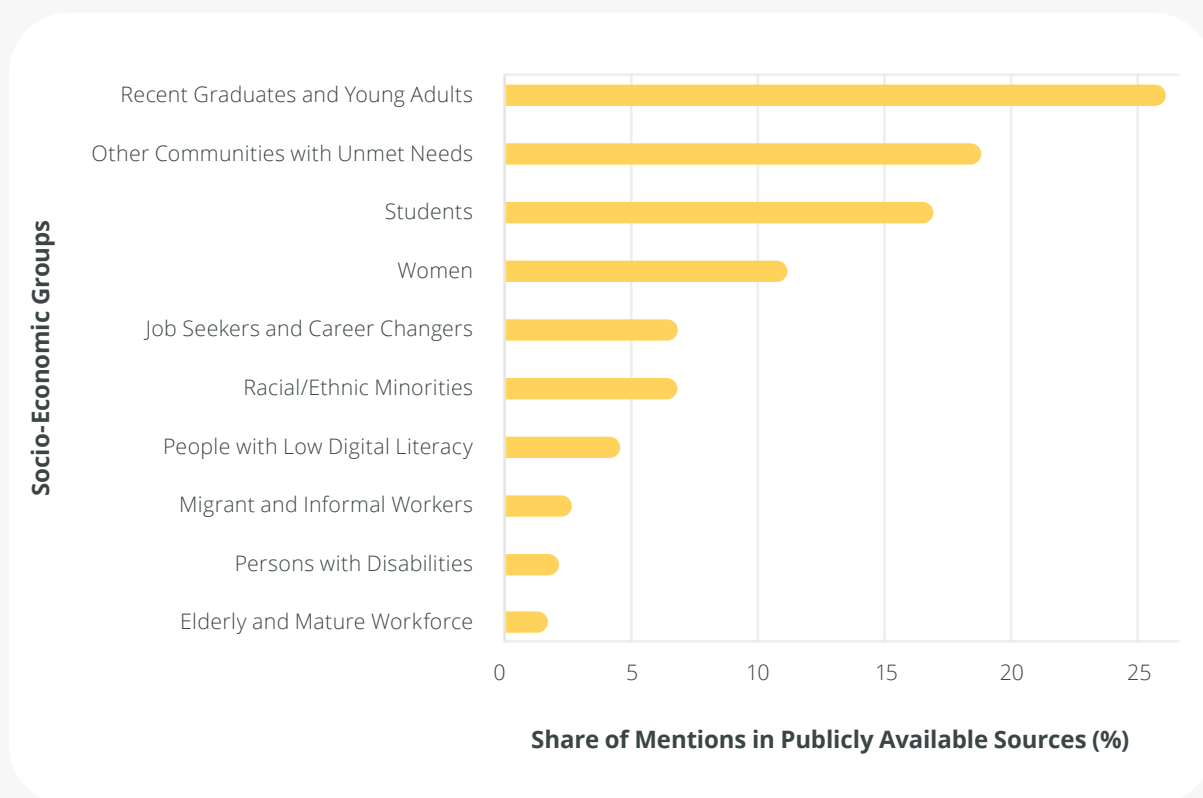


Figure 6: Share of Socio-Economic Groups Mentioned in Publicly Available Sources³²

Age impacts how people experience the AI transition, shaping their adaptability, perceptions, and access to opportunities in the evolving technological landscape. Recent graduates and young adults face critical questions of employability as the job market becomes increasingly AI-driven.³³

32 Encompasses data collected during Phase I of the research using AI-powered methods to analyse publicly available sources, including 350,000 news articles in seven languages (English, Mandarin Chinese, Hindi, Malay, Indonesian, Japanese, and Korean) from early 2022 to July 2024, 60,000 academic articles, over 350 policy documents, and web content from more than 6,000 automated searches. Insights from this data were validated and refined in Phases III, IV, and V through clustering, expert interviews, and synthesis, as outlined in the methodology.

33 Based on Phase I of the research methodology which sought to capture mentions across news articles, academic articles, policy documents; and web content collected through automated web searches. Recent graduates and young adults captured over 25% of publicly available sources.

Our study found that 1 in 5 young professionals are already participating in AI skilling programmes,³⁴ but the surge in AI-related job postings, particularly in markets like Taiwan, underscores the urgent need for upskilling for the rest to meet rapidly changing industry demands.³⁵

On the other hand, the mature workforce is 1.6 times more likely to distrust AI and twice as likely to cite language barriers as a major hurdle.³⁶ They often have less exposure to digital tools and face a steeper learning curve due to outdated skills.³⁷

Women account for 35% of the APAC workforce,³⁸ and AI creates new avenues for them to thrive. The ILO highlights the need to proactively equip women with the digital skills and knowledge to navigate this changing landscape³⁹ through investing in education and training programmes focusing on AI-related fields like data science, machine learning, and AI ethics. As women are heavily represented in roles poised for technology-driven shrinkages, such as office support and customer service, AI reskilling and upskilling initiatives will be particularly valuable for this community.⁴⁰

Based on the above, the next section explores essential skilling clusters, which the research posits should be central to enhancing the resilience of those communities with unmet needs during the AI transition.



34 Based on Phase II of the research methodology, where 2,840 people surveyed across the essential skilling clusters and focal markets were asked about the challenges of using AI.

35 [DigiTimes Asia, Taiwan's job market booms with AI amid historic labor shortage, 2024.](#)

36 Based on Phase II of the research methodology, where 2,840 people surveyed across the essential skilling clusters and focal markets were asked about the challenges of using AI.

37 Identified in the Phase I of the research methodology, elderly and mature workforce captured approximately 2% of publicly available sources.

38 [Equileap, Gender Equality in Asia-Pacific, 2022.](#)

39 [ILO, Generative AI and Jobs: A global analysis of potential effects on job quantity and quality, 2023.](#)

40 [McKinsey Global Institute, Generative AI and the future of work in America, 2023.](#)

Understanding the Essential Skilling Clusters

Eight groups emerge as prime candidates for targeted AI-skilling initiatives. These groups were clustered and prioritised based on their existing skill profiles, potential to benefit from AI-focused workforce development programmes, and demographic significance in the focal markets. Also assessed were their potential access or lack thereof to such programmes, factoring in their socio-economic context, associated skills, roles, and industries they are engaged in alongside their geographic distribution. The essential skilling clusters are:

1. Recent Graduates and Young Adults (15–29 years)
2. Job Seekers and Career Changers
3. People with Low Digital Literacy
4. Migrant and Informal Workers
5. Women
6. Racial/Ethnic Minorities
7. Persons with Disabilities (PWDs)
8. Elderly and Mature Workforce (50–65 years)

It is also important to consider how these groups can benefit from the **Transformation, Adaptation, and Access** articulated in Section 2.1.

As illustrated in the charts (see Figure 7), the recent graduates and the mature workforce are likely to benefit from **Adaptation** (i.e. adapting existing skills or upskilling themselves effectively). Meanwhile, women, individuals with low digital literacy, and racial and ethnic minorities are predominantly discussed in terms of **Access** (i.e. effectively improving access to employment opportunities with AI), and informal workers are spoken about in relation to **Transformation** (i.e., reskilling to ensure employability).

How to Read the Chart

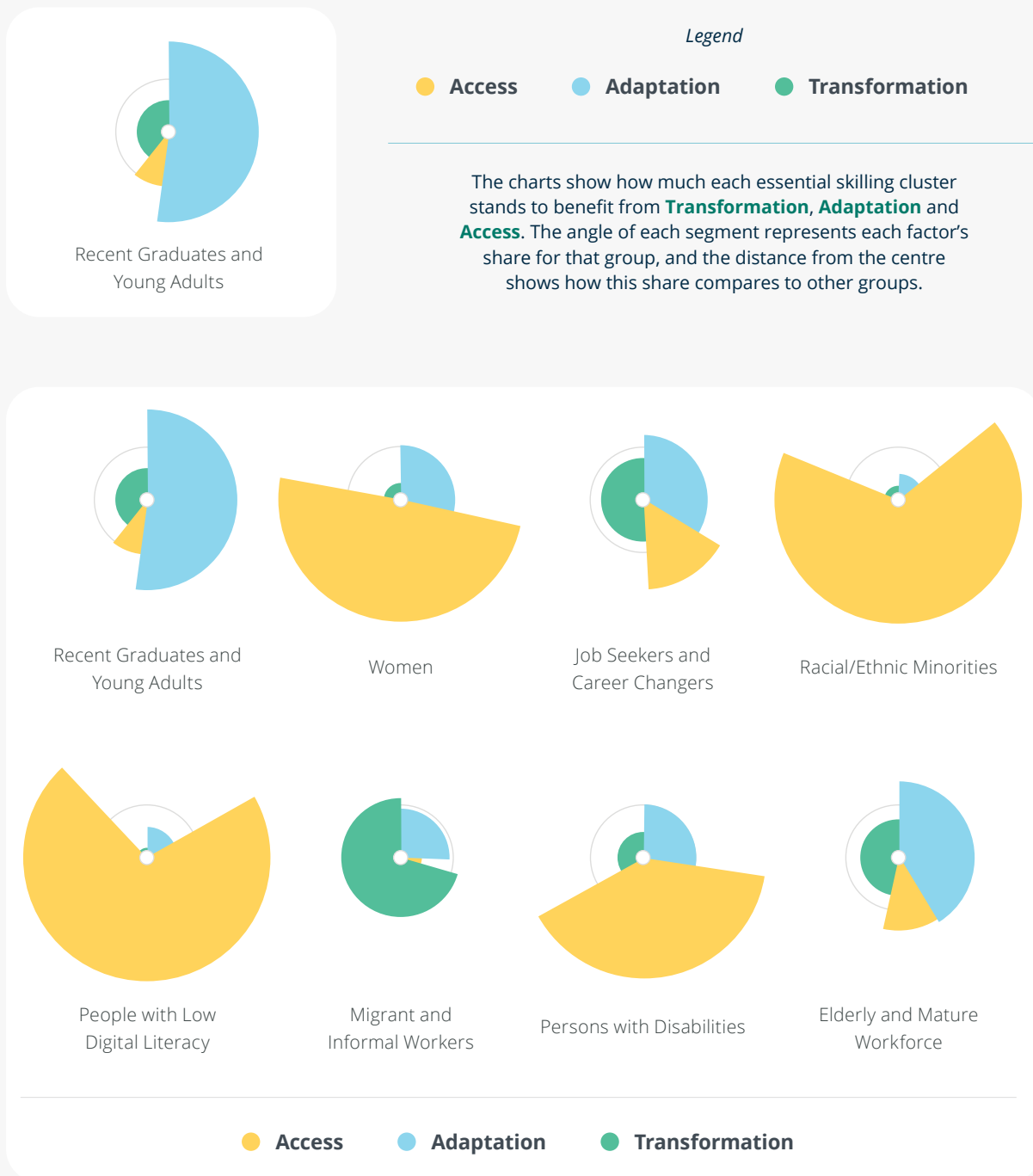


Figure 7: The Impact of Transformation, Adaptation, and Access on Essential Skilling Clusters

Recent Graduates and Young Adults



Recent Graduates and Young Adults

Supporting Evidence: Strong

High frequency of mentions in publicly available data and strong alignment with skills impacted.

Geographic Focus: All the focal markets

This essential skilling cluster will likely encounter opportunities in the AI transition through **Adaptation** and **Transformation** in the job. It emerges among the largest essential skilling clusters across all markets—ranking second largest in Taiwan, third largest in South Korea and Singapore, fourth largest in Vietnam, Indonesia, Japan, and Australia, and fifth largest in India.

In India, the potential impact of delivering AI Skilling efforts to recent graduates and young adults is likely to have a substantial positive impact given the sheer size of the population with basic/high-level qualifications and no work experience looking for employment in the technology sector. Many organisations are no longer hiring based on the candidate's traditional technical skillset but on their ability to use AI tools and adaptability to technological advancements. More recently, between 2023–2024, even students from premium engineering colleges who would be employed globally find themselves without jobs.⁴¹



The candidate profile that companies are looking for today is very different to what it was even in 2022 or 2023. There is a very clear shift in that companies are now looking for people with the ability to use AI tools and harness critical thinking, effective communication, and intuition... it's about thinking and doing things beyond routine tasks. These are skills that the workforce in India, being the masses that go through the public schooling system, simply do not have.

— CEO, ANUDIP FOUNDATION, INDIA

⁴¹ [The Times of India. Pursuing engineering once a fad, now a dilemma: Only 10 percent of 15 lakh graduates likely to land jobs this year. 2024.](#)



Job Seekers and Career Changers



Job Seekers and Career Changers

Supporting Evidence: Strong

Medium frequency of mentions in publicly available data and strong alignment with skills impacted.

Geographic Focus: Japan, Vietnam, Singapore, India, and Australia, with a few mentions in other focal markets

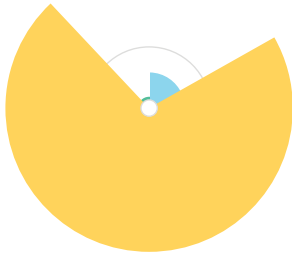
Job seekers and career changers stand to benefit from the **Transformation** of skills and roles through reskilling as the future of work evolves. Moreover, as the competitive edge shifts towards those with digital skills, these individuals can benefit from **Adaptation** and upskilling to remain competitive in the job market.

This group ranks highly in Indonesia, where there is a growing recognition among professionals of the need to adapt their skills to remain competitive in the job market. In Indonesia, unemployment rates among educated young individuals rose significantly after the COVID-19 pandemic⁴² and continue to remain high. This trend suggests that a significant number of young job seekers with higher education are struggling to secure employment. Paradoxically, many businesses in Indonesia face challenges in finding early career workers with the necessary skills their companies require, highlighting a disconnect between educational institutions and industry, resulting in young workers not acquiring the qualifications and skills needed by the workforce.⁴³

⁴² Medium, [Tackling Youth Unemployment Issue in Indonesia, 2021](#).

⁴³ Ibid.

People with Low Digital Literacy



People with Low Digital Literacy

Supporting Evidence: Medium

Low frequency of mentions in publicly available data and strong alignment with skills impacted.

Geographic Focus: Indonesia, Vietnam, India, and Japan, with a few mentions in other focal markets

Individuals with low digital literacy emerge as an essential skilling cluster amid the AI-driven workforce transformation. This group ranks among the top three clusters in Vietnam, Indonesia, and India.

They stand to benefit significantly from workplace **Access**, particularly through AI-guided screening and decision-making powered by anti-bias algorithms that do not discriminate against those with digital disadvantages due to low digital proficiency. As AI technologies rapidly evolve, individuals with low digital literacy often struggle to keep up. Skill-building initiatives will be crucial in helping them meet the demands of a digitised job market. These initiatives could enable them to leapfrog and reach parity with other workforce segments that are also just beginning to engage with applied AI.

This group is especially prevalent in countries with a significant digital divide, where many individuals, particularly in rural areas, lack access to digital tools or technology. For example, individuals in rural settings face particular challenges, as many do not have access to or the skills to use basic mobile devices.⁴⁴



⁴⁴ As reflected in expert interviews.



Migrant and Informal Workers



Migrant and Informal Workers

Supporting Evidence: Medium

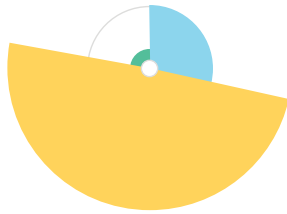
Low frequency of mentions in publicly available data and reasonable (medium) alignment with skills impacted.

Geographic Focus: All the focal markets

Migrant and informal workers are among the top three essential skilling clusters in Vietnam, India, and Indonesia and are well-positioned to benefit from job **Transformation** opportunities. Their prominence stems largely from their socio-economic context—informal workers, who often lack economic stability and formal labour rights, face heightened job insecurity. In India, the sizeable informal workforce, particularly in sectors like textiles, leather, and packaging, may be significantly affected by task automation. As AI adoption grows in developing countries such as Vietnam, India, and Indonesia, this group stands to benefit from targeted skilling initiatives tailored to their specific needs.

Migrant workers face additional challenges, including language barriers and legal issues. Providing them with opportunities to adapt to evolving skill requirements in a rapidly changing job market can enhance their market integration and economic resilience.

Women



Women

Supporting Evidence: Strong

High frequency of mentions in publicly available data and reasonable (medium) alignment with skills impacted.

Geographic Focus: Indonesia, Vietnam, India, and Japan, with a few mentions in other focal markets

The group was identified as a widely prevalent essential skilling cluster, consistently ranking among the top two across all focal markets, with particular significance in Indonesia, India and Australia. Our analysis indicates that this group will primarily benefit from workplace **Access** opportunities brought about by AI (such as bias-free hiring enabled by AI tools). However, workers in this cluster will also benefit from navigating skill **Adaptation** effectively.

Further, this cluster includes women job seekers and career changers. This suggests that mothers re-entering the workforce might be a specific group to consider, particularly in markets such as Japan, Vietnam, Singapore, India, and Australia. For example, in Japan, refugees who are single mothers emerged as a group needing support.⁴⁵

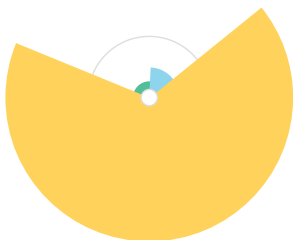
For workers within this cluster who face significant challenges, such as unmet basic needs, limited housing options, and difficulties in finding schooling for their children, providing access to AI skilling initiatives can help them better integrate into the workforce by acquiring the necessary skills to meet the demands of a rapidly evolving job market.



⁴⁵ As reflected in Expert Interviews.



Racial/Ethnic Minorities



Racial/Ethnic Minorities

Supporting Evidence: Medium

Medium frequency of mentions in publicly available data and reasonable (medium) alignment with skills impacted.

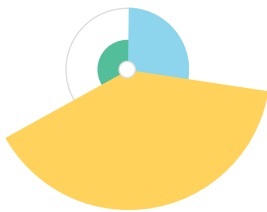
Geographic Focus: Australia and Singapore, with a few mentions in other focal markets

Racial and ethnic minorities, including Indigenous populations such as the Māori and Pacific communities, also emerge as crucial communities with unmet needs. Consequently, they have become an essential skilling cluster, representing the second-largest cluster in Australia and Singapore.

This group stands to benefit significantly from AI-driven workplace **Access**, supported by the widespread adoption of bias-free hiring practices enabled by AI tools, among other factors.



Persons with Disabilities (PWDs)



Persons with Disabilities

Supporting Evidence: Medium

Low frequency of mentions in publicly available data and reasonable (medium) alignment with skills impacted.

Geographic Focus: Australia, with a few mentions in other focal markets

PWDs stand to benefit significantly from AI-driven workplace **Access**. Particularly in Australia and South Korea, there is strong recognition of the significance of this community in the AI transition and the challenges they face, especially in recruitment processes. However, for improved access, it is crucial to go beyond bias-free screening and hiring to ensure meaningful skills **Adaptation** that makes work experiences more accessible for this community.

Elderly and Mature Workforce



Elderly and Mature Workforce

Supporting Evidence: Medium

Low frequency of mentions in publicly available data and reasonable (medium) alignment with skills impacted.

Geographic Focus: South Korea, Singapore, Japan, Taiwan, and Vietnam, with a few mentions in other focal markets

Geographically, this essential skilling cluster is particularly prominent in South Korea, Japan, and Taiwan. In Japan, this group is notably ranked high in prominence, reflecting a large ageing population that is often reluctant to adopt technological advancements. This community stands to benefit from job **Adaptation, Access, and Transformation** brought about by the AI transition. Therefore, it is crucial to provide upskilling and reskilling initiatives to ensure continued employment for workers in this cluster.





Geographical Distribution of Essential Skilling Clusters

Ensuring an AI Just Transition lens means being intentional about designing targeted interventions that address the geographical distribution of different groups. For instance, people with low digital literacy and informal workers are comparatively more prevalent in Vietnam, Indonesia, and India, highlighting the need for digital workforce development initiatives that are accessible to these worker groups.⁴⁶

In Vietnam, only 36% of youth aged 15 to 24 possess basic digital skills.⁴⁷ In contrast, Japan and South Korea have sizeable mature workforces. In Japan, around 14% of the workforce (9.1 million people) is aged 65 or older, while in South Korea, nearly 25% of individuals aged 70 and above remain employed. This reflects the strong potential for AI skilling solutions that improve access across age groups.^{48,49} Meanwhile, in Australia, people with disabilities and racial and ethnic minorities represent groups with relatively larger populations, further emphasising the need for accessible AI education. The chart below compares the size of these groups across each focal market, allowing us to identify where targeted interventions will be most impactful (see Figure 8).⁵⁰

46 [UNICEF. Viet Nam is among few countries demonstrating gender parity in digital skills and the use of internet. 2023.](#)

47 Ibid.

48 [A Third of Japanese People Aged 70 to 74 Still in the Workforce, Nippon, 2023.](#)

49 [How South Korea Is Tackling Its Demographic Crisis, Time, 2024.](#)

50 This chart assesses the geographical dimensions of the groups across the markets where their prevalence per 1,000 people is highest. The bars show whether a group's volume per 1,000 people is above or below the average for all focal markets. The colour scale conveys the same information, with red indicating a greater volume and blue indicating a smaller volume compared to the average. For absolute rather than relative volumes per 1,000 people, see Appendix B "Comparison of Essential Skilling Clusters per Market."

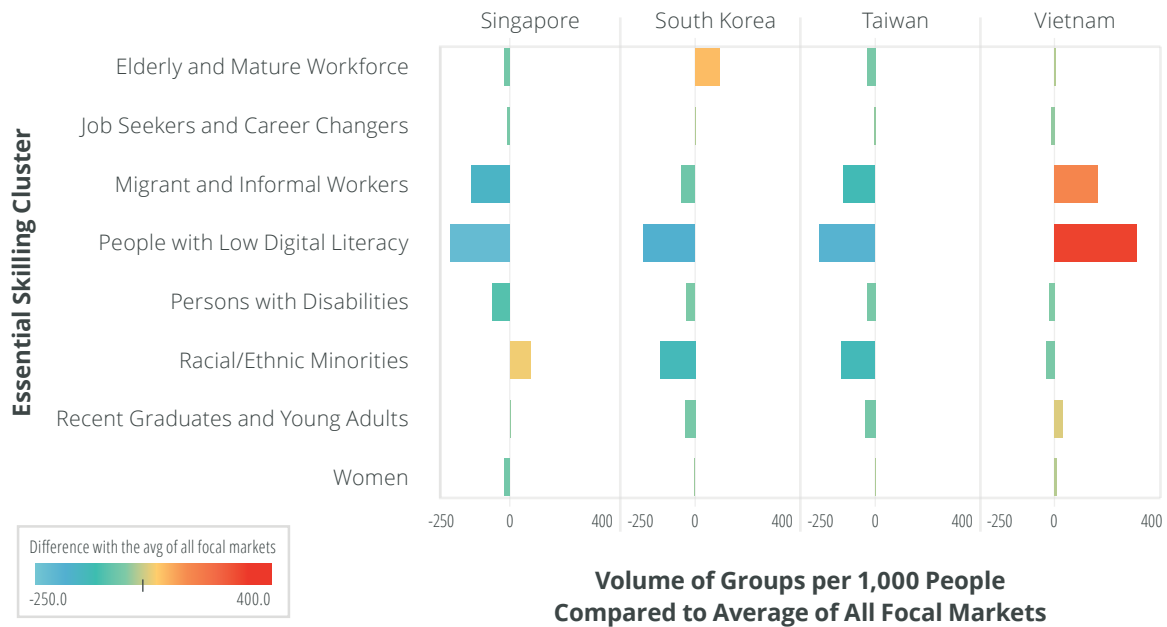
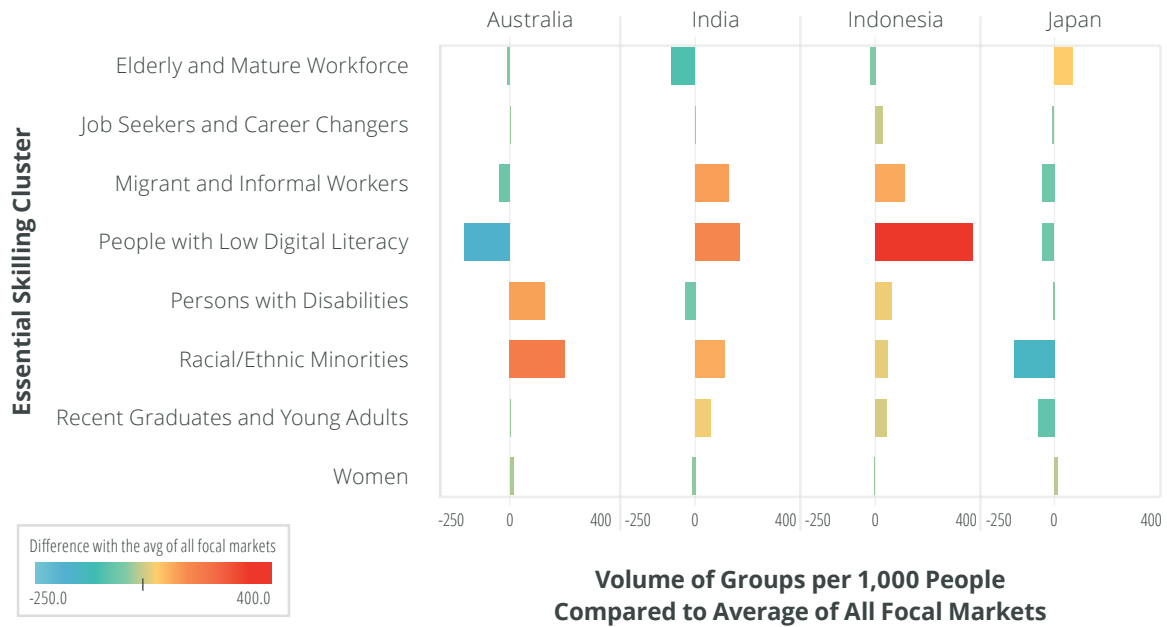


Figure 8: The Comparison of Essential Skilling Clusters Relative to the Average Across All Focal Markets

Effective AI Skilling: Insights from Essential Skilling Clusters

As part of this study, a cross-regional survey of almost 3,000 respondents from essential skilling clusters was conducted. This is the most extensive survey to date exploring and incorporating the unique experiences from target end-beneficiaries across all eight focal countries and territories.

The main objective was to help identify the unique challenges, skill requirements, and AI skilling needs of each cluster. The survey revealed significant gaps in awareness, access to tools, digital literacy, concerns over job displacement, and trust in AI. Key insights, summarised in Table 1, indicate critical areas for developing effective AI skilling programmes.



SOCIO-ECONOMIC GROUP	CHALLENGES	SKILLS NEEDED	AI SKILLING RECOMMENDATION	ENHANCING ACCESSIBILITY
Recent Graduates and Young Adults	Effective utilisation and understanding of AI tools	Critical thinking and problem-solving skills	Contextual AI training and integration	Flexible participation and scheduling
Job Seekers and Career Changers	Personal data security and privacy concerns	AI tool utilisation and data proficiency	Tutorials and online courses for practical AI use and implementation	Engaging and tailored learning experiences
People with Low Digital Literacy	Effective utilisation and understanding of AI tools	AI tool utilisation and data proficiency	Contextual AI training and integration	Multilingual programmes and language support
Migrant and Informal Workers	Internet connectivity and limited access to AI tools and resources	AI tool utilisation and data proficiency	Contextual AI training and integration	Multilingual programmes and language support
Women	Job replacement due to AI automation	Communication and interpersonal skills	Tutorials and online courses for practical AI use and implementation	Flexible participation and scheduling
Racial/Ethnic Minorities	Over-reliance on AI results in laziness	Technological skills and digital literacy	Advanced programming courses	Engaging and tailored learning experiences

Table 1: Insights from Essential Skilling Clusters on AI Skilling Needs⁵¹

The survey highlighted the need for AI skilling programmes tailored to these diverse needs and challenges, which can, in turn, support broader access and participation in the digital economy.

- **Lack of Awareness of AI Skilling Programmes:** Increasing awareness and participation are crucial to maximise the impact of the existing AI and digital skilling initiatives. Only 15% of respondents have engaged in AI skilling programmes, with more than half (57%) unaware of their existence, and only 15% had participated, presenting a sizeable opportunity to enhance outreach efforts and ensure these valuable resources reach a wider audience.⁵²

⁵¹ The beneficiary surveys explored the survey taker's perception of AI, the challenges they face, the skills they need, and how skilling activities can be made more accessible to them. The table provides an overview of the characteristic themes that emerged from their responses. Additional details on the beneficiaries' perspectives are provided in the following sections. "Persons with disabilities" is not included in this table, as the survey avoided asking directly about sensitive information to respect participants' privacy.

⁵² Based on Phase II of the research methodology, where 2,840 people surveyed across the essential skilling clusters and focal markets were asked about their awareness on existing programmes for AI skilling.



- **Challenges in AI Credibility and Reliability:** Effective skilling initiatives can address concerns around trust in AI-generated information (15% of respondents) and the potential for over-reliance (10% of respondents) (see Figure 9). By equipping individuals with the knowledge and skills to critically evaluate AI-generated information, understand the limitations of AI, and effectively leverage AI tools, there is an opportunity to build confidence and ensure responsible AI adoption. This is particularly relevant for the elderly workforce, which requires trust-building and user-friendly training, which can improve accessibility and play a key role in fostering improved familiarity and confidence when learning AI fundamentals.
- **Gaps in Existing AI Skilling Programmes:** Around 2 in 5 survey respondents (39%) indicated a preference for contextual training with practical, real-world applications over advanced AI expertise (see Figure 9). A better understanding of AI (30%) and continuous skill development (24%) can help address some of the inertia to adapting. Hands-on learning experiences, examples of the application of AI concepts to job contexts, and support for continuous skill development can bridge the gap between training and industry needs.^{53, 54, 55} Recent graduates and young adults, along with those who may face barriers to digital access, for example, prioritise developing critical thinking, communication, and interpersonal skills, areas not at risk from automation but can instead be complemented by effective use of AI.

53 Based on Phase II of the research methodology, where 2,840 people surveyed across the essential skilling clusters and focal markets were asked about what types of skilling and programmes they would find useful.

54 Ibid.

55 Ibid.

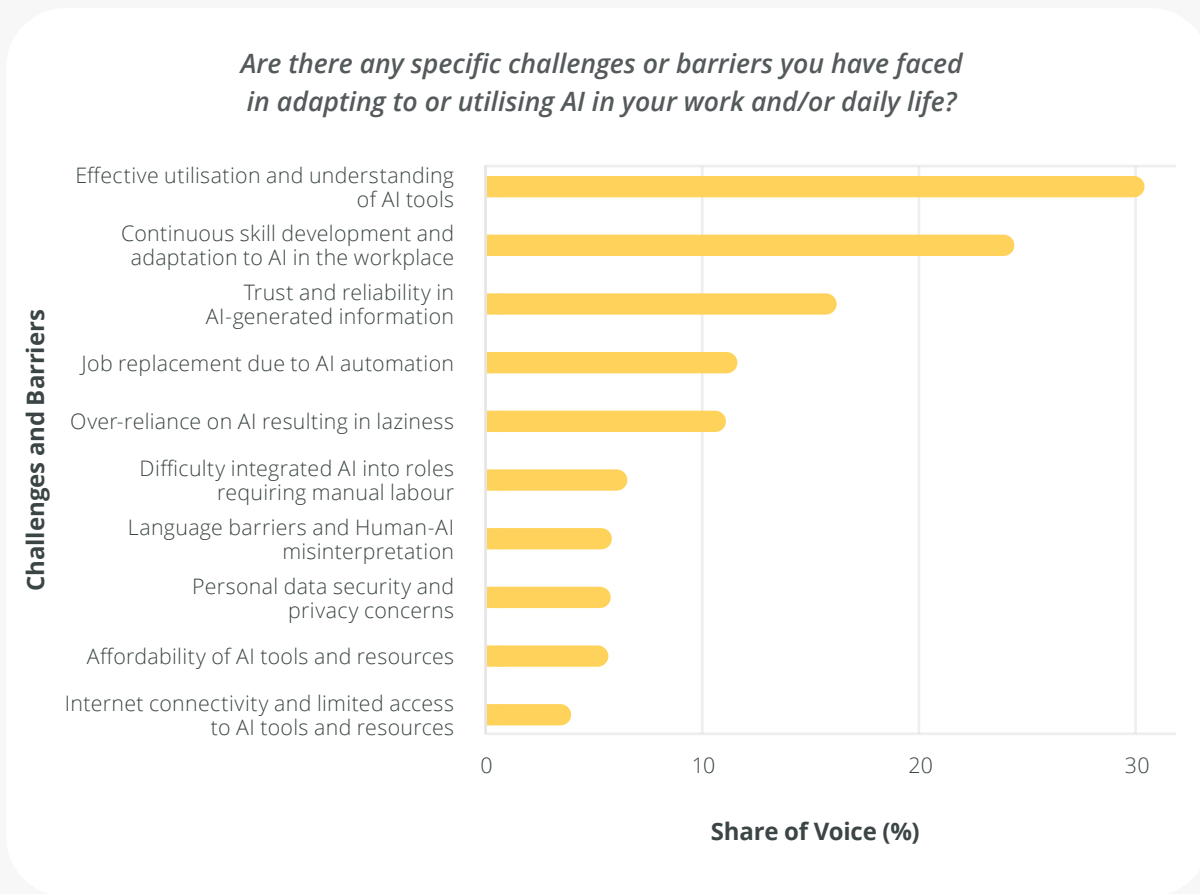


Figure 9: Challenges to Utilising AI Based on the Beneficiary Survey

- Impact of Education Level on AI Familiarity and Perception:** There is a clear link between education level and AI familiarity. Only 23% of respondents with a high school degree or less are familiar with AI and its tools, compared to almost 50% of those with a graduate degree who are familiar or very familiar with AI tools. Across education levels, greater AI familiarity is linked with stronger optimism about its potential to enhance jobs, with 4 in 5 data annotators and software developers—typically holding graduate degrees—expressing optimism about AI’s potential. However, greater AI familiarity also correlates with increased awareness of job displacement risks, with 4 in 5 of the aforementioned workers indicating a high awareness of potential job displacement as a consequence of the AI transition. In contrast, only 2 in 5 skilled tradespersons, such as carpenters, welders, and machinists, show concern about AI replacing their jobs, even as industries increasingly adopt smart manufacturing and automation.

- Gap in Matching the Skilling Needs of Essential Skilling Clusters and Available Skilling Opportunities:** Cross-analysing the needs of the essential skilling clusters with the availability of AI skilling opportunities provides valuable insights for optimising future interventions. While significant progress has been made, this analysis reveals areas for further improvement. Workers with low digital literacy and women exhibit lower-than-average access to skilling activities (see Figure 10).⁵⁶ This highlights the importance of targeted efforts to ensure improved access to high-quality AI training programmes.

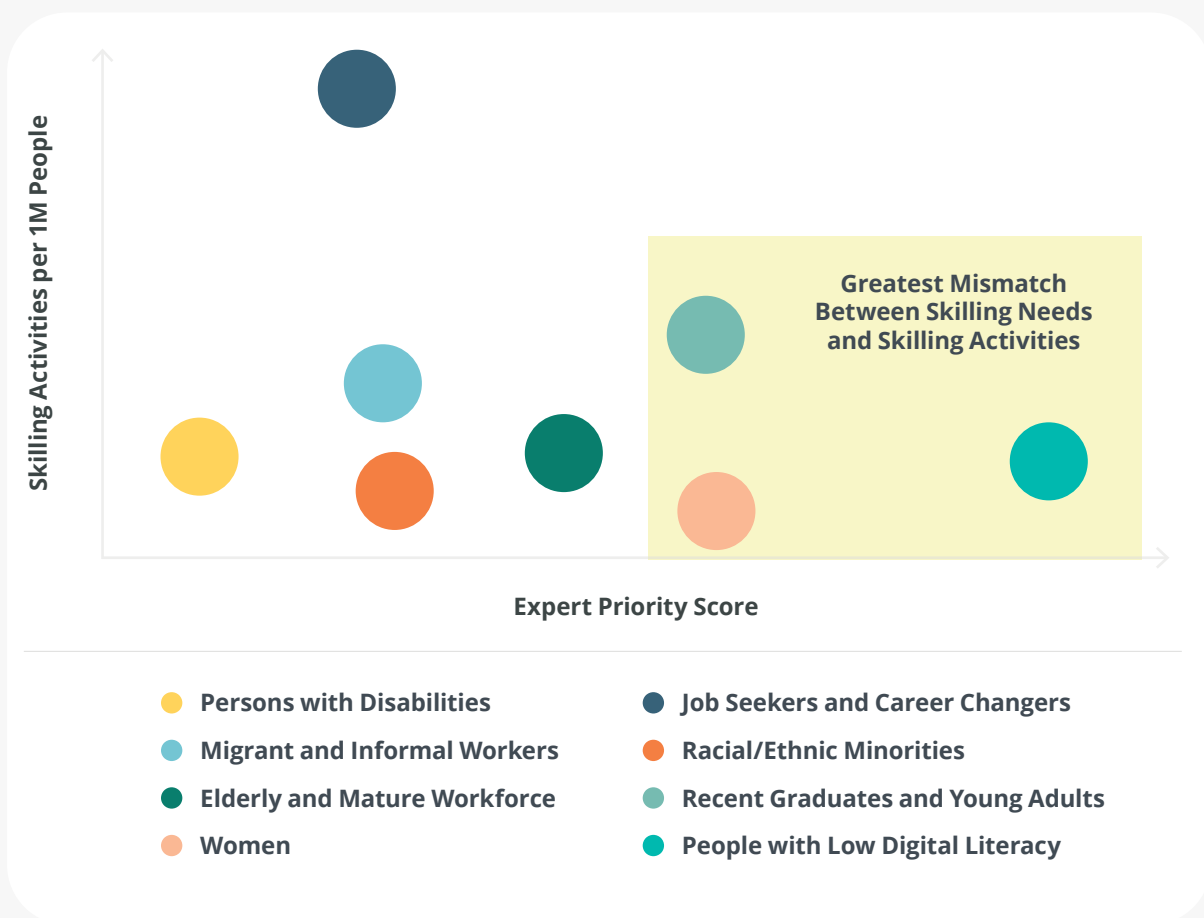


Figure 10: Mapping Essential Skilling Cluster Needs Against Available Activities Based on Expert Scoring⁵⁷

⁵⁶ Skilling activity density is calculated through the number of skilling activities targeting each essential skilling cluster per 1 million people in each group in the focal markets as an approximation to group size and the portion reached, highlighting supply gaps based on the populations.

⁵⁷ Based on Phase IV of the research methodology, where an expert panel rated the urgency of skilling each of the identified essential skilling clusters based on the metrics and insights about the groups generated in this study, as well as their own insights and experiences from each market. *Figure 10 presents the aggregated expert scores on the horizontal axis and the number of skilling activities per million people within each group on the vertical axis.*

- **Perceived Accessibility Across Multiple Dimensions:** When asked how AI skilling programmes could be made more accessible, 51% of those surveyed cited the need for multilingual programmes and language support, followed by 45% who emphasised the importance of flexible participation and scheduling (see Figure 11).⁵⁸ Migrant and informal workers, in particular, face language barriers and have limited access to AI resources, while women prefer flexible schedules and customised learning experiences. The elderly and mature workforce, on the other hand, favour more user-friendly platforms. Addressing these needs is crucial for making AI skilling programmes accessible and effective for key target groups.

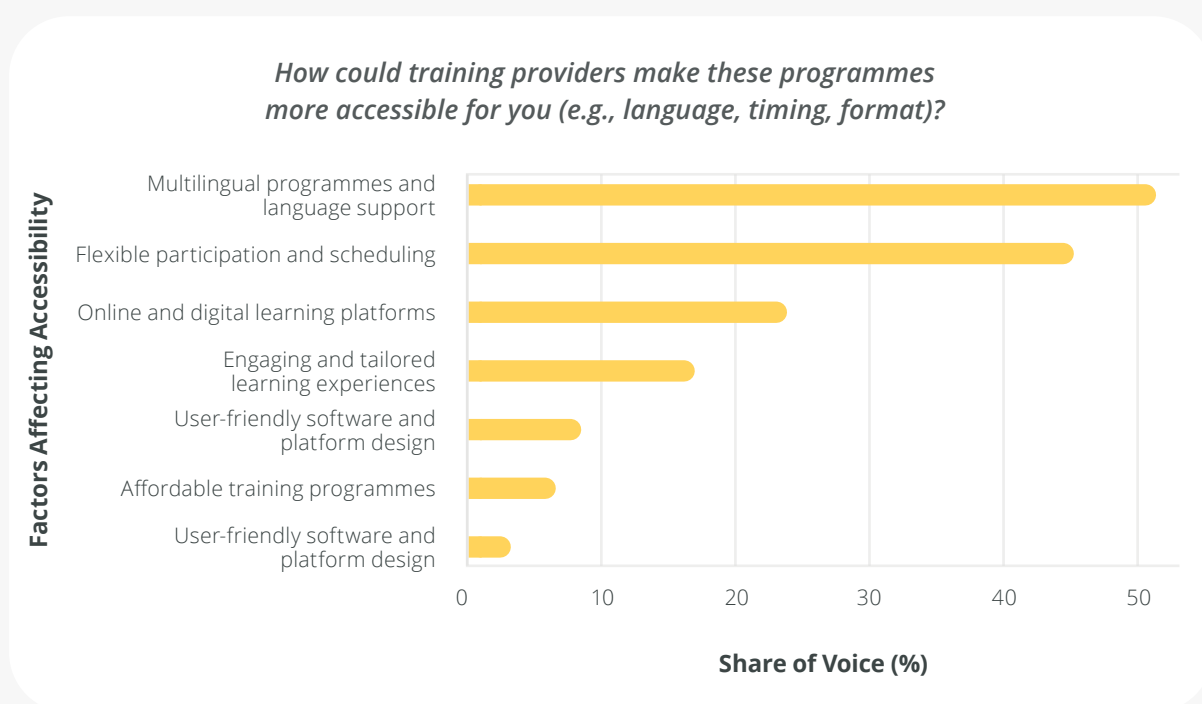


Figure 11: Accessibility of AI Skilling Programmes Based on Beneficiary Surveys

⁵⁸ Based on Phase II of the research methodology, where 2,840 people surveyed across the essential skilling clusters and focal markets were asked about how training programmes can be more accessible.

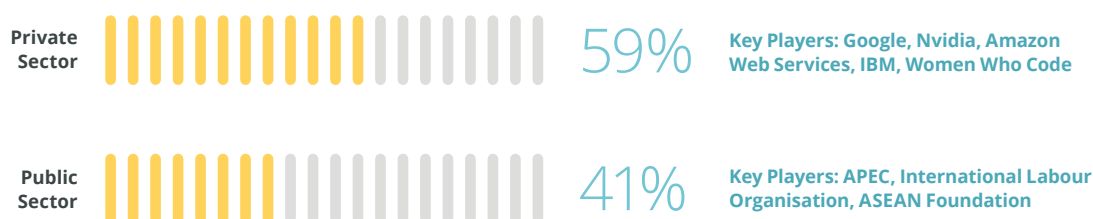
Understanding the Supply Side of AI Skilling

Having identified the demand for skilling, this study shifts its focus to the supply side of AI-associated skills development. Our analysis reviewed nearly 20,000 skilling activities led by almost 6,000 organisations in the Asia-Pacific region.⁵⁹ This section provides insights into the types of skilling programmes, highlights key stakeholders driving these efforts, and explores the public and private sector's roles in addressing regional skilling gaps. By analysing the impact and performance metrics available for each initiative, 600 organisations and their thousands of initiatives were selected as best practice examples for further investigation (See Section 6).⁶⁰

Of the organisations offering skilling activities in the region, 59% operate in the private sector, and the remaining 41% operate in the public sector. Notably, in all focal markets, private-sector organisations outnumber their public-sector counterparts and place a stronger emphasis on providing technical skilling initiatives for women, particularly those in remote or rural areas, workers in the IT sector, and workers in consumer and service-oriented sectors. Key private sector players in the region include Google, Nvidia Corporation, FutureWork Institute, Amazon Web Services, IBM, and Women Who Code. Key intergovernmental organisations include the Asia Pacific Economic Cooperation (APEC), the International Labour Organisation, and the ASEAN Foundation.

The reviewed organisations were then clustered into 10 skilling clusters based on the content and target groups of their skilling programmes (see Figure 12).

Supply Side of AI Skilling Activities in Asia-Pacific



⁵⁹ 19,146 skilling activities organised by 5,383 organisations were identified through media mining and AI-powered online research.

⁶⁰ The metrics used to select example initiatives are extracted from the source material as reported, including but not limited to number of participants trained annually and in total, completion rate, accessibility considerations, and target programme reach.

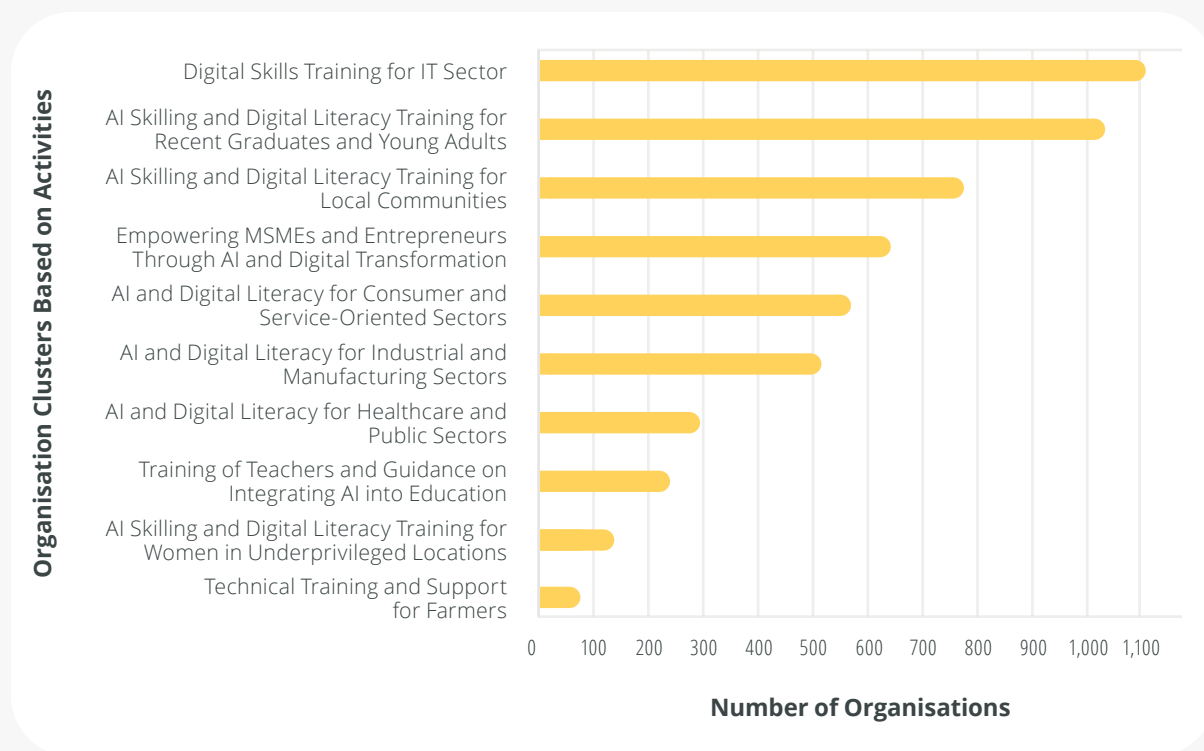


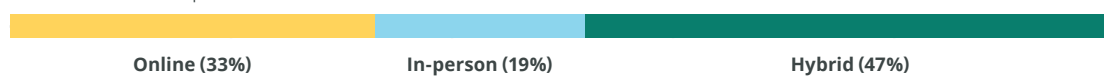
Figure 12: Number of Organisations per Cluster

Each of these is discussed in turn with case examples, starting with communities with unmet needs, such as local communities, recent-graduates, young adults and women, followed by sector-focus skilling clusters, including consumer and service-oriented sectors, healthcare and public sectors, industrial and manufacturing sectors, education sector, farming sector, SMEs sector and IT sector.



Digital Skills Training for Workers in the IT Sector

Mode of Participation



Public vs. Private Sector



This cluster consists of organisations dedicated to enhancing technological skills among professionals in areas like AI, data analytics, cloud computing, and cybersecurity. They offer training programmes, workshops, and certifications to bridge skill gaps and prepare individuals for the digital landscape. These initiatives target various demographics, from students to seasoned professionals, and aim to promote AI literacy and technical expertise, contributing to workforce readiness and adaptability amid rapid technological advancements.

Organisations Include: GXS Digital Skills Training Initiative (Singapore), Givery Inc. Training Platforms (Japan), Kearney Talent Development Initiatives (Global), Cloudsecure Solutions Upskilling Programme (Singapore), Redrob AI-Powered Job Matching Platform (India), Japan-India Skill Development Initiative (India), Cathay Financial Holdings Training Programmes (Taiwan).

Case Study: National Innovation Center (NIC)

Market(s): Vietnam

The National Innovation Center (NIC) in Vietnam is a government-backed initiative under the Ministry of Planning and Investment. The NIC is a hub for fostering innovation, entrepreneurship, and digital skills development nationwide. The NIC is central to Vietnam's strategy to build a robust digital economy by addressing skills gaps and promoting technological adoption in the public and private sectors.⁶¹

Focus and Target Group

The NIC collaborates with USAID and supports universities and colleges in establishing innovation and skills centres. The focus includes training in technical and entrepreneurial skills, enabling students and startups to adapt to industry needs.

Approach

Through partnerships with global technology leaders like Google, NIC helps bridge the digital skills gap, contributing significantly to the development of Vietnam's digital workforce. One of the key initiatives is the Google Career Certificates Programme, which is sponsored by NIC.⁶² This programme provides free access to high-quality digital skills courses in areas such as IT support, data analytics, digital marketing, user experience design, project management, and cybersecurity.

Impact

Through the Google Career Certificates Programme, the NIC has already provided learning opportunities for 20,000 students, with more than 5,000 participants completing at least one course and earning professional certifications.

⁶¹ [OpenGoveAsia, Nurturing Vietnam's Digital Workforce for the Future, 2024.](#)

⁶² [Vowworld, Google inaugurates digital talent and start-ups support programmes in Vietnam, 2022.](#)



AI Skilling and Digital Literacy Training for Recent Graduates and Young Adults

Mode of Participation



Public vs. Private Sector



This cluster includes organisations such as educational institutions, government bodies, and private-sector collaborations that prioritise integrating modern technologies into curricula and training programmes. Key activities involve comprehensive workshops, online courses, and interactive learning experiences that cover critical areas such as artificial intelligence, digital marketing, coding, and data analytics. These initiatives aim to bridge the gap between academic knowledge and industry demands by targeting students and teenagers across various regions, empowering a digitally literate generation prepared for future challenges in an increasingly tech-driven world.

Organisations Include: Youth Catholic Center—Petra Digital (Indonesia), Cognavi India, SMA Muhammadiyah 1 Yogyakarta (Indonesia), Karnataka Skill Development Corporation (India), Digital Academy India, and Edgepoint Infrastructure (Southeast Asia).

Case Study: Grow with Google

Market(s): Across Asia-Pacific

Launched by Google in 2017, the Grow with Google initiative involves close collaborations with local governments, the private sector and NGOs across Asia Pacific to train over 60 million people. This initiative offers self-paced online programmes to help individuals, businesses, and communities enhance their digital skills, boost careers, and grow businesses through free training, tools, and resources. The programmes include topics ranging from basic digital literacy to advanced professional skills, such as AI and machine learning, to meet learners' needs. The initiative is part of Google's broader efforts to support economic development and address digital skills gaps worldwide.⁶³

Focus and Target Group

This programme is intended to cater to the needs of different groups, including students and graduates, local communities, entrepreneurs, and businesses.

Approach

The initiative provides free online courses, live training sessions, and tutorials on various topics, including data analysis, coding, project management, AI, and machine learning basics. The courses are often hosted on platforms such as Coursera, edX, or Google's own training platforms.

Impact

Since its inception, Grow with Google has reached millions of individuals worldwide. The programme has been especially valuable in areas with limited access to traditional skills training, providing a pathway to career advancement and entrepreneurship.

⁶³ [Grow with Google, Here to help you grow, 2024.](#)

Case Study: Ministry of Communication and Information Technology (KOMINFO)

Market(s): Indonesia

The **Ministry of Communication and Information Technology** in Indonesia plays an important role in advancing digital skills and artificial intelligence education for the youth. One of their efforts is the Digital Talent Scholarship Programme (DTS), which provides technical training in various fields, including cloud computing, artificial intelligence (AI), big data, and cybersecurity.⁶⁴

Focus and Target Group

This programme is intended to improve the skills, competitiveness, productivity, and professionalism of human resources in the field of information and communication technology for the young Indonesian workforce. The programme specifically targets students and youth as a significant part of its audience.⁶⁵

Approach

The programme combines online and offline training formats designed to maximise participation and ensure that diverse groups can benefit from it, including students and youth.

Impact

Since its inception, the programme has had 250,000 participants, with 48% female representation.⁶⁶

64 [Digitalent Kominfo, Digitalent programme, Digital Talent Scholarship, 2024.](#)

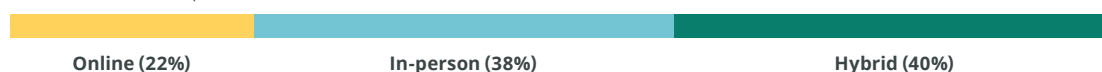
65 [Antara News, Digital Talent Scholarship programme has eight academies, 2023.](#)

66 [Kominfo, Data capaian Beasiswa Digital Talent, 2024.](#)



AI Skilling and Digital Literacy Training for Local Communities

Mode of Participation



Public vs. Private Sector



Organisations in this cluster are dedicated to enhancing the technological competencies of individuals through activities such as tailored training programmes, workshops, and educational initiatives that address the unique needs of local communities—which include rural populations, Indigenous groups, and PWDs. These organisations use advanced technology like AI and digital tools to help people confidently use modern digital platforms and expand access to job opportunities. By engaging in strong partnerships, they're closing the digital gap, driving sustainable growth, and getting communities ready to tackle future challenges and make the most of opportunities in the digital world.

Organisations Include: IIT Hyderabad (India), Greater Hamilton Library (Australia), Bakti Kominfo (Indonesia), Hrd Corp (Malaysia), and Kementerian Komunikasi dan Informatika (Indonesia).

Case study: Google's Digital Future Initiative

Market(s): Australia

The Digital Future Initiative is Google's largest-ever investment in Australia, announced in November 2021 with a commitment of USD1 billion over five years. This initiative was given a boost with the announcement of 10,000 scholarships for Google's Career Certificate programme focused on women and First Nations Australians. The initiative focuses on advancing Australia's digital economy through digital infrastructure, research and technology, and strategic partnerships.^{67, 68}

Focus and Target Group

This initiative strongly focuses on women and First Nations Australians through programmes like the First Australians Digitisation Fund, which, in collaboration with INCO, provides over AUD 750,000 (USD 488,000) in funding to organisations working to bridge gaps in digital access.

Approach

The programmes offer a combination of online and in-person training formats. Certain programmes, especially those tailored for local communities like First Nations Australians or specific groups such as women, include in-person workshops to ensure culturally relevant training that often involves face-to-face interaction to ensure accessibility and cultural alignment.⁶⁹

Impact

The initiative is expected to generate over 28,000 new jobs, including 6,529 direct roles in technology and related fields across Australia and deliver AUD 1.3 billion (USD 845.1 million) in direct investment and AUD 6.7 billion (USD 4.4 billion) in total economic impact.⁷⁰

67 [Google Australia Blog, How AI is shaping Australia's digital future, 2024.](#)

68 [Google Australia Blog, One year of the Digital Future Initiative, 2024.](#)

69 [IT Brief Australia, Google and INCO's \\$750,000 First Nations digitisation fund, 2022.](#)

70 [Tech Guide, Google Australia pledges \\$1bn in Digital Future Initiative to boost Australia's prospects, 2021.](#)

Case study: Digital India Initiative, FutureSkills Prime

Market(s): India

The Digital India initiative, launched by the Government of India, aims to transform India into a digitally empowered society and knowledge economy. The initiative focuses on enhancing digital infrastructure, improving online service delivery, and increasing digital literacy, particularly in rural communities, to ensure that technology reaches every part of the country. The FutureSkills Prime initiative is one of several programmes under the Digital India umbrella. This initiative focuses on reskilling and upskilling the Indian workforce in emerging technologies, including AI, machine learning, data analytics, and cybersecurity.

Focus and Target Group

This initiative aims to develop job-ready skills across diverse industries with artificial intelligence & machine learning. The focus is on developing skills in applied AI, AI fundamentals, data science, machine learning techniques, and data processing and visualisation.⁷¹ The FutureSkills Prime initiative primarily targets a broad range of audiences across India, but there is a strong focus on reaching rural communities and empowering women in tech. Collaborations with organisations like the NASSCOM Foundation and Women in Tech aim to increase female representation in tech through mentorship, scholarships, and career support services.⁷²

Approach

The FutureSkills Prime initiative is primarily designed as an online learning platform. It offers a wide range of courses, training modules, and workshops in emerging technologies. The platform provides flexibility for learners to access content anytime and anywhere, making it highly suitable for self-paced learning. Some courses include blended learning options, with in-person workshops with partner institutions or organisations.

Impact

FutureSkills Prime is rallying the country's citizens to promise to skill, reskill, and upskill. Nearly 1.4 million learners, 2000+ colleges, and 100+ corporates nationwide are already marching towards this goal with FutureSkills Prime. Additionally, the percentage of female learners on this platform is almost 42%.⁷³

⁷¹ [FutureSkills Prime, Artificial intelligence and machine learning.](#)

⁷² [CRN India, Sawit AI partners with Google, Women Techmakers, FutureSkills Prime, FICCI FLO, and Sheroes to equip 1 crore women in Gen AI, 2024.](#)

⁷³ [FutureSkills Prime, India's Technology Skilling Hub, 2024.](#)



Empowering MSMEs and Entrepreneurs through AI and Digital Transformation

Mode of Participation



Public vs. Private Sector



Organisations in this cluster focus on enhancing the capabilities of Micro, Small and Medium Enterprises (MSMEs) and entrepreneurs by equipping them with essential digital skills such as AI integration, e-commerce strategies, digital marketing, and data analytics. These initiatives provide targeted training programmes, workshops, and mentorship to promote digital transformation and innovation. By empowering businesses to leverage modern technologies, the organisations in this cluster aim to bridge the digital divide and foster sustainable growth in the digital economy.

Organisations Include: Quinton Group (Malaysia), Sony Group Corporation (Japan), PT SmartPlus Accelerator (Indonesia), Futuretech Solutions (Singapore/Malaysia), Digital Innovators Hub (Malaysia/Indonesia/Australia), IBM Advisia Group Korika (Indonesia), Villgro Innovation Foundation (India).

Case Study: Japan Reskilling Consortium with Google

Market(s): Japan

The Japan Reskilling Consortium (JRC) is a public-private initiative led by Google Japan in partnership with government bodies like the Ministry of Internal Affairs, the Ministry of Economy, Trade, and Industry, and the Digital Agency. It aims to support workforce development by helping individuals across Japan acquire new skills necessary for evolving job markets. The programme focuses on areas like digital literacy, artificial intelligence, cybersecurity, and data analysis, addressing challenges like labour shortages and digital divides.⁷⁴

Focus and Target Group

The JRC offers training programmes to help students learn new skills and a job-matching service that provides access to a wide range of opportunities. One of its aims is to support Japanese businesses, startups, and workers, meet businesses' skills needs, and contribute to technology-driven economic growth.

Approach

The courses offered through the Japan Reskilling Consortium are primarily online, making them accessible to participants across Japan. These include self-paced learning modules and live virtual training sessions. Some training providers within the consortium might also offer hybrid options or in-person sessions, especially if they partner with local organisations or municipalities.

Impact

As of mid-2024, the consortium includes over 240 participating organisations, offering 1,400+ training programmes. It has attracted more than 140,000 members, spanning individuals and organisations, indicating significant interest and engagement nationwide.⁷⁵

⁷⁴ [Google, Digital skills for Japan's Future, 2022.](#)

⁷⁵ [Japan Reskilling Consortium, Find the skills and jobs you need now, 2024.](#)

Case Study: Pahlawan Digital UMKM 2022

Market(s): Indonesia

Pahlawan Digital UMKM 2022 seeks to drive significant digital transformation within Indonesia's Micro, Small, and Medium Enterprises (MSMEs) sector. The programme identifies and equips digital innovators, referred to as "digital heroes," to support MSMEs in elevating their digital capabilities and market competitiveness.

Focus and Target Group

The initiative focuses on engaging digital innovators across Indonesia who are poised to aid MSMEs in adopting digital solutions. These digital heroes work directly with MSMEs to enhance their digital capabilities, aiming to boost productivity, expand market reach, and improve competitiveness.

Approach

The programme registered 269 digital innovators from regions of Indonesia. Following a rigorous evaluation, 20 finalists were selected to engage in a month-long intensive workshop designed to equip them with the skills and knowledge necessary to effect meaningful digital transformation for MSMEs.⁷⁶

During this phase, the digital heroes mentor MSMEs, integrating digital tools into business operations and addressing seven critical aspects of digitalisation: market access, knowledge quality, financing, management, production capacity, supplier networks, and distribution channels. The aim is to provide holistic support tailored to the unique needs of MSMEs, facilitating their successful transition into the digital domain.

Impact

The programme concluded with a competitive final pitching event and the announcement of winners, each offering unique solutions to MSME challenges. Each innovator received financial awards and the opportunity to partner with KemenkopUKM to scale digital onboarding for 30 million MSMEs by 2024.⁷⁷

⁷⁶ [Cabinet Secretariat of the Republic of Indonesia, Pahlawan Digital UMKM 2022: 269 Inovator Digital Siap Dukung UMKM Naik Kelas, 2022.](#)

⁷⁷ [Ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia, Sukses Digelar, Ini Juara Pahlawan Digital UMKM, 2022.](#)



AI Skilling and Digital Literacy for Consumer and Service-Oriented Sectors

Mode of Participation



Public vs. Private Sector



Organisations within this cluster focus on building skills in industries like hospitality, finance, content creation, and retail. They use AI and digital tools to improve customer service, engagement, and efficiency. Through training programmes, workshops, and other initiatives, they help professionals learn key digital skills like AI analytics, digital marketing, and data management.

Organisations Include: Byru (Indonesia), TIFAC—Shramik Shakti Manch (India), Moj (India), Narrato (Global), Social Media Platforms (Indonesia), Techstars Indonesia, Digital Content Association Malaysia, Japan Hotel Association (Japan).

Case Study: Telecom Sector Skills Council (TSSC)

Market(s): India

The Telecom Sector Skills Council (TSSC) has launched various digital skilling initiatives to address the skills gap in the telecom industry, particularly in Madhya Pradesh, India. The organisation utilises over 80 existing training centres to provide skilling, upskilling, and reskilling programmes focused on telecom technologies, including the Internet of Things (IoT), cloud computing, AI/machine learning (ML), cybersecurity, and more.⁷⁸ Currently, these centres have an active capacity of 7,500 trainees and aim to upskill an additional 5,000 youths through new initiatives.

Focus and Target Group

TSSC focuses on enhancing the workforce's skills in the rapidly evolving telecom and technology sectors. The target groups are professionals in the telecom industry, youth and recent graduates, and communities with unmet needs who may not have access to such training otherwise.⁷⁹

Approach

TSSC offers a blend of online and in-person training formats. This hybrid approach allows for greater flexibility and accessibility, accommodating a wide range of learners across different regions of India, including those in rural/remote areas.

TSSC intends to set up at least two Training of Trainer (ToT) and Training of Assessor (ToA) academies. These academies will focus on improving the quality of trainers and assessors within the state, thereby enhancing the overall effectiveness of training programmes. TSSC is planning to train and place over 150,000 candidates in telecom and related emerging technologies in the next financial year to reduce the demand-supply workforce gap of 28% in the workforce.⁸⁰

⁷⁸ [TelecomDrive, How TSSC is enabling the 5G workforce in India, 2023.](#)

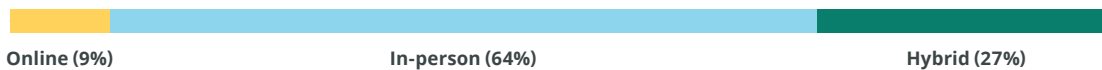
⁷⁹ [Telecom Sector Skill Council, Vision and mission, 2021.](#)

⁸⁰ [Business Standard, Telecom Sector Skill Council aims to train, place 150,000 candidates in 25 states, 2023.](#)



AI Skilling and Digital Literacy for Industrial and Manufacturing Sectors

Mode of Participation



Public vs. Private Sector



Organisations in this cluster are dedicated to advancing technological capabilities and workforce skills in industrial and manufacturing sectors. They are actively engaged in initiatives that integrate artificial intelligence and digital literacy into their operations. These organisations emphasise the importance of upskilling employees through targeted training programmes that cover AI applications, machine learning, data analytics, and digital transformation strategies. By fostering a culture of continuous learning and innovation, the organisations in this cluster aim to equip the workforce with essential competencies needed to navigate the evolving industrial landscape.

Organisations Include: Talent Corporation Malaysia Berhad (Malaysia), Industry Skills Council Malaysia (Malaysia), Bridgestone Corporation (Japan), Astra Otoparts (Indonesia), Mazda Motor Corporation (Japan), and Pt Sinar Mas Mining (Indonesia).

Case Study: Tata Technologies and Government of Uttar Pradesh Modernising Industrial Training Institutes (ITIs)

Market(s): India

Tata Technologies, a global leader in engineering and digital services, has partnered with the Government of Uttar Pradesh to transform 150 Government-owned Industrial Training Institutes (ITIs) into modern technology hubs. This collaboration is part of a 10-year initiative aimed at upgrading the ITIs to meet Industry 4.0 standards, equipping students with modern infrastructure, industry-relevant curriculum, and hands-on experience with advanced technologies.⁸¹

Focus and Target Group

The project aims to address the growing need for advanced technical skills among the youth and workforce of Uttar Pradesh, one of India's largest states. The initiative focuses on upskilling over 1,200,000 students annually through modernised ITIs. These ITIs will provide training for students and act as skill centres for Micro, Small, and Medium Enterprises (MSMEs), offering resources to artisans and local industries in the state. New trades, including Product Design, Additive Manufacturing (3D printing), IoT, Robotics, and AI-based Virtual Welding, will be introduced as part of the ITI curriculum to meet the demands of the growing industrial sector.⁸²

Approach

Tata Technologies will work alongside the Government of Uttar Pradesh to modernise these ITIs through a hybrid model combining physical infrastructure upgrades and digital solutions. Approximately 10,000 square feet of new space will be developed at each ITI. The programme will also introduce 23 new short-term courses in areas relevant to Industry 4.0, ensuring that students and industries are equipped with the skills necessary to embrace digital transformation. Training will be delivered through both physical workshops and digital platforms, giving students and MSMEs access to real-world, practical training.⁸³

81 [Tata Technologies, Tata Technologies collaborates with the Government of Uttar Pradesh to transform Industrial Training Institutes \(ITIs\) into modern technology hubs, 2023.](#)

82 Ibid.

83 Ibid.

Impact

Once completed, the project is expected to train over 1,200,000 students annually, significantly improving the technical and vocational education landscape in Uttar Pradesh. In addition to training, the ITIs will serve as technology hubs, supporting MSMEs that may not have the financial resources to access high-end technological equipment. By incorporating advanced skills in areas like AI, industrial robotics, and 3D printing, the ITIs will provide students with industry-relevant skills that directly enhance their employability in the rapidly evolving manufacturing sector.⁸⁴

⁸⁴ [Tata Technologies, Tata Technologies collaborates with the Government of Uttar Pradesh to transform Industrial Training Institutes \(ITIs\) into modern technology hubs, 2023.](#)

Case Study: Smart Factory + Automation World

Market(s): South Korea

Smart Factory + Automation World (SFAW) in South Korea is a major industrial event focusing on integrating cutting-edge automation and digital transformation technologies into manufacturing with government collaboration. This event serves as a hub for connecting global technology providers with South Korea's industrial sector, focusing on fostering a workforce capable of navigating the rapidly evolving landscape of digital manufacturing.

Focus and Target Group

While the SFAW focuses heavily on integrating automation technologies to create fully integrated technology-based manufacturing systems (smart factories), it extends beyond technology to workforce development. It offers workshops, live demonstrations, and seminars to educate attendees on leveraging automation and digital systems in the industrial and manufacturing sectors.

Approach

The SFAW hosts live demonstrations, workshops, and seminars and emphasises preparing workers for roles in automation and robotics. Participants learn to manage and troubleshoot automated systems through demonstrations and training modules, ensuring smooth integration into existing workflows.

Impact

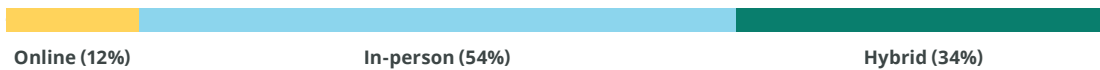
The South Korean government incentivises the adoption of smart factories and advanced technologies through grants, tax benefits, and partnerships. SFAW is a venue to announce and demonstrate such programmes, ensuring wide dissemination to industry stakeholders. The government committed to providing support to help train 40,000 skilled workers to operate fully automated manufacturing sites through various educational programmes.⁸⁵ The event aligns with South Korea's national strategies, such as the Fourth Basic Plan for Intelligent Robots (2024–2028) and initiatives to promote Industry 4.0. These policies focus on integrating advanced automation and robotics into manufacturing and reskilling the workforce.

⁸⁵ [International Trade Administration, Manufacturing Technology—Smart Factory, 2023.](#)



AI Skilling and Digital Literacy for Healthcare and Public Sectors

Mode of Participation



Public vs. Private Sector



Organisations in this cluster work to improve AI and digital skills in healthcare and the public sector across different regions. They partner with key players like government health ministries, hospitals, schools, and private companies to bring AI and digital tech into their operations. In healthcare, they run training programmes to help professionals use AI for better patient care and smoother workflows. The public sector focuses on building digital skills to improve governance and services, helping officials adapt to the growing use of digital tools and AI.

Organisations Include: Abac (Taiwan/APEC Economies), Kementerian Kesehatan (Indonesia), Ho Chi Minh City Department of Health (Vietnam), Government Health Agencies in Collaboration with Tech Firms (India), Ministry of Health and Welfare (South Korea), Wipro GE Healthcare (India).

Case Study: AI for Healthcare Programme

Market(s): Singapore

The AI for Healthcare Professionals Training Programme is a collaborative initiative between SingHealth and AI Singapore to enhance AI education in healthcare. The programme offers modules on AI applications such as data analysis and machine learning. This programme aims to equip healthcare professionals—including doctors, nurses, and administrative staff—with the skills necessary to integrate AI into their daily practices.⁸⁶

Focus and Target Group

The goal is to bridge the gap between healthcare and AI, facilitating joint research projects and innovation to improve patient care and healthcare processes using AI technologies. The target group is healthcare professionals.

Approach

The programme operates in a hybrid format, with both online courses and in-person workshops for hands-on training. The initiative includes a comprehensive AI curriculum featuring e-learning videos, physical classes, and workshops. The training focuses on various topics, including AI ethics, clinical decision support, and enhancing productivity in healthcare settings.

Impact

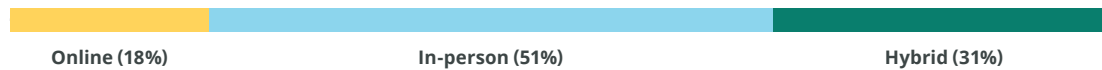
The programme was recently launched, with the first batch starting in June 2024. It includes healthcare datathons that serve as collaborative events where clinicians, data scientists, and engineers work together on real clinical data to develop innovative AI solutions. These datathons allow participants to gain hands-on experience and help transform clinical problems into research projects that can directly benefit patient care.

⁸⁶ [HealthXchange, SingHealth and AI Singapore sign a memorandum of understanding to boost AI education in healthcare, 2023.](#)



Training of Teachers and Instruction on Integration of AI into Education

Mode of Participation



Public vs. Private Sector



Organisations in this cluster focus on equipping educators with AI skills to improve teaching practices. They offer comprehensive AI training programmes that build digital skills and encourage innovative teaching methods. These initiatives promote AI literacy among educators, helping them integrate new technologies in the classroom. They also offer workshops on key AI concepts, ethical issues, and practical applications in education. Together, these efforts aim to enhance educational outcomes and prepare students for a technology-driven future.

Organisations Include: Talent Corporation Malaysia Berhad (Malaysia), Industry Skills Council Malaysia (Malaysia), Bridgestone Corporation (Japan), Astra Otoparts (Indonesia), Mazda Motor Corporation (Japan), and Pt Sinar Mas Mining (Indonesia).

Case Study: Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Market(s): Japan

MEXT in Japan has launched various initiatives to integrate AI into education and improve AI literacy among teachers and students. These include the development of frameworks to help schools use AI ethically and effectively, as well as collaborations with organisations like the Japan Deep Learning Association (JDLA) and various universities to provide training modules for teachers on AI concepts and applications.^{87, 88}

Focus and Target Group

The ministry focuses on AI in education, targeting students and teachers. The ministry is also incorporating AI concepts into school curricula, starting at the elementary level.

Approach

Training modules provided by organisations like JDLA include workshops on integrating AI tools into classrooms for personalised learning, grading automation, and administrative efficiency.

Impact

Through these collaborations, the ministry has begun transforming Japanese classrooms by enabling ICT-based learning and providing students and teachers with competencies for the digital era.

⁸⁷ [UTokyo, AI Initiative Projects, 2024.](#)

⁸⁸ [Japan Deep Learning Association, The AI Governance Ecosystem, 2024.](#)



AI Skilling and Digital Literacy Training for Women in Underprivileged Locations

Mode of Participation



Public vs. Private Sector



Organisations in this cluster focus on empowering women through education. They work to close the gender gap in technology by offering training programmes that teach both basic digital skills and advanced AI. Programmes like the Generative AI Learning Challenge and AI Upskilling Bootcamps give women practical knowledge and real-world experience with new technologies, helping them build careers and achieve financial independence in the long term through enhanced employability.

Organisations Include: South Asia Women in Tech (SAWIT) and Guvi—Generative AI Learning Challenge (India), Women in Tech Foundation—Upskilling Women in Technology through AI Training (Southern India), Kementerian BUMN—AI Skills Training Programmes (Indonesia), University of Indonesia—Data Science Workshop for Women (Indonesia), Women Who Code Bangladesh—AI Upskilling Bootcamp for Women (Bangladesh), Pasona Group—Code; Without Barriers in Japan (Japan).

Case Study: Women in Tech Foundation

Market(s): Global

The Women in Tech Foundation is a global movement focusing on upskilling women in India. The organisation focuses on upskilling women in technology through various training initiatives, particularly in AI.⁸⁹ The foundation aims to empower women by providing them with the skills needed to succeed in the tech industry, where there is a significant gender disparity.

Their AI training programmes are designed to address the current skills gap, emphasising practical applications of AI in the workplace. The foundation recognises that as AI transforms the job landscape, it is crucial for women to be involved in its development and implementation to ensure improved and accessible solutions.

Focus and Target Group

The foundation's initiative, Upskilling Women in Technology through AI Training, targets women from rural backgrounds in Southern India (Tamil Nadu and Karnataka). This online programme covers various AI technologies, including natural language processing, computer vision, and ethical AI practices.

Approach

This programme operates predominantly online and includes workshops, coding and mentoring sessions, and practical projects. The foundation offers mentoring programmes for women and emphasises community and networking through online and in-person meetups, professional groups, and forums.

Impact

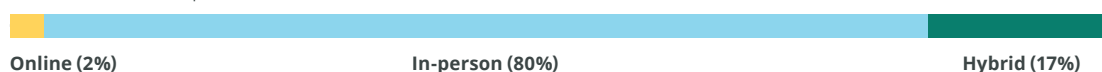
This programme trains approximately 2,500 women annually across Southern India.

⁸⁹ [Women in Tech Foundation, Women in Tech India, 2024.](#)



Technical Training and Support for Farmers

Mode of Participation



Public vs. Private Sector



Organisations in this cluster focus on enhancing agricultural practices through modern technology and skills development. They empower farmers with digital literacy, AI, drone technology, and precision farming skills. These initiatives aim to improve productivity and sustainability by offering training in data analytics, the Internet of Things (IoT), AI-driven crop management, and smart farming.

Organisations Include: Garuda Aerospace and Ninjacart (India), International Rice Research Institute (Southeast Asia), Smartagri Institute (India), Agritech Institute (Southeast Asia), Dronetech Solutions (Malaysia), Indonesian Ministry of Agriculture (Indonesia), Sabah Agricultural Department (Malaysia).

Case Study: Ag Institute Australia (AIA)

Market(s): Australia

The Ag Institute Australia (AIA) is a professional body dedicated to advancing agriculture, natural resource management, and related industries in Australia. The institute places significant emphasis on enhancing agricultural practices through integrating modern technology and continuous skills development. This focus is aligned with the industry's increasing need to adopt advanced technologies like AI, precision farming, and sustainable resource management.⁹⁰

Focus and Target Group

The AIA focuses on aligning with the industry's increasing need to adopt advanced technologies like AI, precision farming, and sustainable resource management. The AIA helps farmers understand and implement these technologies and AI systems effectively into farming practices through various programmes.

Approach

To ensure agricultural professionals stay updated with the latest trends, tools, and best practices in modern farming, the AIA offers a structured accreditation programme where members engage in specialised training courses on topics like sustainable agriculture, robotics in farming, and agricultural biotechnology. The AIA also regularly organises workshops, webinars, and mentoring sessions on integrating new technologies.

Impact

This AIA aims to benefit approximately 200 participants annually through its programmes, achieving an 80% completion rate and helping 75% of participants report improved digital skills in agriculture.

⁹⁰ [Ag Institute Australia, About Ag Institute Australia, 2024.](#)

Market Overviews

As the AI-driven workforce transition progresses, AI awareness and skilling are becoming critical in all focal markets. However, the policy landscape for AI adoption and workforce adaptation varies across them.



A Snapshot of Policy Landscape for AI Adoption and Workforce Across the Eight Focal Countries and Territories

Australia

Australia focuses on reducing the digital divide and fostering inclusion through substantial investments and targeted educational reforms, ensuring ethical AI deployment and workforce readiness.

India

India prioritises bridging the digital divide and promoting inclusivity with initiatives supported by strong government funding, educational integration, and international partnerships to enhance AI skills across diverse populations.

Indonesia

Indonesia aims to bridge the digital divide with focused financial support and educational initiatives, complemented by international collaborations and private sector engagement to develop a skilled IT workforce.

Japan

Japan combines substantial public funding, comprehensive educational programmes, and international partnerships to promote AI literacy while establishing ethical guidelines and legislative frameworks for responsible AI deployment.

Singapore

Singapore's strategic focus on substantial public funding, inclusive educational integration, and international partnerships aims to rapidly expand its AI workforce and ensure equitable digital literacy for all societal segments.

South Korea

South Korea emphasises multifaceted AI skilling through public-private partnerships, legislative frameworks, and targeted educational and financial initiatives, ensuring equitable technology access and workforce readiness.

Taiwan

Taiwan supports AI skill development through dedicated funding, educational integration, and international collaborations, with a strong emphasis on ethical standards and modernising key industries through legislative measures.

Vietnam

Vietnam's strategic approach blends public funding, international collaboration, and sector-specific initiatives to enhance digital literacy and workforce readiness, emphasising equitable access and industry-aligned educational outputs.



Japan, Singapore, and South Korea, which are among the most advanced and economically robust nations in the region, are leading efforts in AI governance and workforce preparation through upskilling and reskilling initiatives. This is particularly true in Singapore, where efforts to prepare the workforce for technology and the impact of automation and AI advances began almost a decade ago with the launch of the SkillsFuture initiative in 2015.

Policy discussions have progressed more slowly in markets such as Indonesia and India. Both markets have large populations employed in highly automatable jobs and essential skilling clusters for whom there is currently no clear AI-enabled pathway, even though policymakers are sensitive to the growing impact of AI. While Vietnam is still in the early stages of AI readiness, the market made significant strides in governance in 2024, emphasising the importance of workforce upskilling and reskilling to prepare for AI and technological advancements.



*In these developing countries that are lagging behind in their efforts,...
You currently have large amounts of the population who are sitting behind
desks busy training AI systems. When we no longer need these roles and the
systems become more and more automated and progressed, there will be
a big question as to what these people in the workforce will do.*

— PRESIDENT & EXECUTIVE DIRECTOR, AI ASIA PACIFIC INSTITUTE, ASIA PACIFIC

Australia



Australia is proactively advancing AI skilling and digital literacy through a comprehensive approach that emphasises reducing the digital divide, integrating AI into education, and transforming the workforce. The Australian government demonstrates a long-term commitment to responsible AI development and workforce readiness through substantial funding and investment, exemplified by the USD 124.1 million AI Action Plan launched in 2021.⁹¹ Government support is further evident through infrastructure development and policies like the Digital Experience Policy 2024.⁹² Legislative actions aim to ensure fairness and transparency in AI recruitment processes, reflecting a broader strategy focused on ethical AI deployment. Sector-specific initiatives like the NextGen Jobs Traineeships programme support workforce readiness and adoption of AI technologies in key industries like agriculture and manufacturing.⁹³

91 [Australian Government, Action plan positions Australia to be a global leader in artificial intelligence, 2021.](#)

92 [Digital Experience Policy, Australia 2024.](#)

93 [NextGen Jobs, I can do anything I want to do, 2023.](#)

Targeted initiatives like the Digital Skills Pilot Programme, launched in 2022, focus on enhancing digital literacy among communities with unmet needs, including low-income communities, rural residents, and indigenous populations.⁹⁴ Educational programmes such as RMIT's Industry Year Initiative, begun in 2024, provide work-integrated learning in technology fields, aligning education with market demands.⁹⁵ Moreover, the ACT Education Directorate's guidelines for responsible AI use underscores a commitment to ethical practices in education.⁹⁶

Public-private partnerships, such as the Robotic Training and Demonstration Technology Centre, established in 2022, address labour shortages and promote local manufacturing growth.⁹⁷

Some Key Policy Initiatives

The National AI Centre

Established by the government in December 2021, this flagship organisation has received USD 39.9 million to enhance AI capabilities and address workforce skill gaps. Key stakeholders include the Australian government's Department of Industry Science and Resources.

Digital Skills Pilot Programme

Involving government bodies and private sector companies, this programme involves collaborations with educational institutions to enhance digital literacy among workers at risk of direct displacement due to automation. The government launched this initiative in February 2022.

AI Action Plan

The government released this initiative in June 2021 and aims to significantly increase the number of digitally skilled workers in Australia, with a target of 1.2 million tech-related jobs by 2034. Specific programmes are being developed to upskill public service employees in using generative AI tools responsibly.

⁹⁴ [NSW Government, Driving Digital Skills Pilot Programme, 2022.](#)

⁹⁵ [RMIT University, RMIT Industry Experiences Programme, 2024.](#)

⁹⁶ [ACT Government, Interim position statement on the use of AI in ACT public schools, 2023.](#)

⁹⁷ [Australian Automation and Robotics Precinct, Global opportunities for leading innovators to harness, 2022.](#)

Other Skilling initiatives

- **TAFE Queensland:** In collaboration with the Queensland Government, TAFE Queensland has launched the Higher-Level Apprenticeship Pilot Programme (2020), enabling workers to gain hands-on experience in applied technologies. This programme, supported by an AUD 300,000 government investment, bridges skill gaps in emerging fields, helping local industries stay competitive by preparing the workforce for digital transformation.⁹⁸
- **Lumify Group:** A leading provider of information and communications technology training and professional development in Australia, Lumify specialises in digital skills training across various industries and offers courses in areas such as data science, software development, cybersecurity, cloud computing, project management, data analytics, and agile methodologies. With six campuses in Australia and blended learning formats, Lumify trains over 15,000 students annually in Australia.⁹⁹

Gaps and Opportunities

Essential skilling clusters in Australia are **PWDs** and **Racial/Ethnic Minorities**.¹⁰⁰ Australia has a relatively stronger focus on PWDs due to a robust disability rights movement, strong government support for accessibility initiatives, and a greater emphasis on digital access. Racial/Ethnic minorities like the aboriginal communities form 3% of the population. They are often challenging to engage with from a technology advancement and training standpoint due to significant trust barriers,¹⁰¹ which are often a consequence of sustained institutional and systemic biases that have hindered their well-being. Despite these challenges, Aboriginal communities stand to benefit significantly from AI skilling and can potentially be engaged in skilling opportunities. The success of these programmes is contingent on whether they can be involved in their design, content, and implementation, thereby empowering them to define the boundaries within which the opportunities are offered.

Rural and remote communities, whilst not identified as one of the skilling groups prioritised in this study, form a large percentage of Australia's population and are thus an essential skilling cluster.¹⁰² In rural areas, many communities do not have access to the Internet or educational opportunities. Within the rural and remote communities are also farmers and agricultural workers interested in engaging with technology, such as AI, to enhance their efficiency and output. Still, cultural issues and a general lack of trust in technology hinder this progress.

98 [Tafe Queensland, Apprenticeship pilot a first for Queensland, 2020.](#)

99 [Lumify, Lumify Australia, 2024.](#)

100 Based on Phase I of the research methodology which sought to capture mentions across news articles, academic articles, policy documents; and web content collected through automated web searches. Racial/Ethnic Minorities and Persons with Disabilities saw over 7% & 2% of mentions identified respectively.

101 As extracted from expert interviews.

102 As extracted from expert interviews.

India



The Indian government's priority is bridging the digital divide and promoting comprehensive efforts through initiatives like the PM-Daksh (Pradhan Mantri Dakshta Aur Kaushal Vikas Yojana) which is designed to bridge the digital divide by equipping individuals from groups such as Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), minorities, and women, with the necessary skills to participate in the digital economy, enhancing their employability and livelihood prospects.¹⁰³ Another example is the AI for All initiative, which offers training programmes and fosters awareness to bridge the gap between technologically advanced regions and communities with unmet needs.¹⁰⁴ Legislative actions are also starting to influence the AI landscape, with the Digital Personal Data Protection Act (2023) emphasising ethical data usage and the incorporation of data privacy into educational curricula.¹⁰⁵ The Ministry of Electronics and Information Technology continues to propose regulations to address job transformation and adaptation resulting from automation, focusing on promoting reskilling and upskilling initiatives. India's AI adoption efforts involve several strategic initiatives, including the National Strategy for Artificial Intelligence (2018)

¹⁰³ [Ministry of Social Justice & Empowerment, PM Daksh, 2021.](#)

¹⁰⁴ [Ministry of Education, AI for All Programme, 2024.](#)

¹⁰⁵ [Ministry of Law and Justice, The Digital Personal Data Protection Act, 2023.](#)

and the Draft National Robotics Strategy (2023).^{106, 107} These initiatives target sector-specific goals, such as advancing AI-driven innovations in agriculture (e.g., robotic tea pluckers) and enhancing manufacturing standards through Industry 4.0 technologies.

Educational integration is a key focus, with the Central Board of Secondary Education (CBSE) introducing AI modules in schools and higher education institutions like IIT Guwahati offering specialised data science and AI programmes. These efforts are supported by significant government funding, mainly through the National AI Mission (2024), which allocates substantial resources for research and skill development.¹⁰⁸ Collaborative efforts with industry leaders like IBM aim to enhance digital skills training nationwide. At the same time, international partnerships such as the iCET initiative with the United States work to align workforce training with global standards.

Private sector involvement is critical in equipping India's large workforce with AI-relevant skills. Initiatives such as AWS EdStart support EdTech firms by reducing operational costs while fostering a workforce skilled in AI technologies,¹⁰⁹ while Tata Technologies' 10-year partnership with the Uttar Pradesh government is upgrading 150 ITIs to meet advanced skill requirements and serve as technology hubs for key industries, including MSMEs.¹¹⁰

106 [NITI Aayog, National Strategy for Artificial Intelligence, 2023.](#)

107 [Ministry of Electronics and Information, Draft National Strategy for Robotics, 2023.](#)

108 [Ministry of Electronics and Information Technology, IndiaAI, 2024.](#)

109 [NITI Aayog, National Strategy for Artificial Intelligence, 2023.](#)

110 [Tata Technologies, Collaborating with the Government of Uttar Pradesh to transform Industrial Training Institutes \(ITIs\) into modern Technology hubs, 2023.](#)

Some Key Policy Initiatives

National AI Strategy

Through this strategy, the government aims to enhance workforce capabilities by fostering collaboration between educational institutions and industry stakeholders like NASSCOM, focusing on reskilling efforts tailored to meet the demands of an AI-driven economy. The government released the strategy in June 2018.

The Skill India Mission

Launched by the government in July 2015, this initiative provides funding for vocational training programmes that focus on emerging technologies, including AI. This government initiative recently launched the Skill India Digital Hub Platform in 2023, aimed at achieving skilling, education, employment, and an entrepreneurship ecosystem in India.¹¹¹

Digital India

A legislative initiative released in July 2015 that aims to enhance digital literacy among populations with unmet needs through targeted funding for technology education programmes. It seeks to integrate communities with unmet needs into the digital economy.

¹¹¹ [Ministry of Skill Development and Entrepreneurship, Bridging India's Skill Gap, Empowering India's Workforce, 2024.](#)

Other Skilling Initiatives

- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** is the flagship scheme of the Skill India Mission. Spearheaded by the Ministry of Skill Development and Entrepreneurship (MSDE) in 2015, the scheme initially intended to provide vocational training and skill development to support both the domestic job market and international demand for skilled labour. Today, it offers short-term skill training and certification in various industry-relevant skills for unemployed youth, school/college dropouts, and others looking to enter the workforce. Training covers areas such as data entry, digital marketing, basic computer skills, web development, and cybersecurity. These short-term training programmes are designed to upskill participants in digital domains essential for entry-level and specialised roles in the job market.¹¹² PMKVY has also been instrumental in introducing 119 new age and future skill courses spanning eight key sectors, ensuring alignment with evolving industry demands.¹¹³
- **NASSCOM** represents and advocates for the technology sector in India, working closely with the government, industry leaders, and academia to foster innovation, drive economic growth, and support skill development. NASSCOM is committed to promoting India's digital transformation and making the country a global hub for digital talent. The FutureSkills platform is a national digital skilling initiative launched by NASSCOM in 2018 in partnership with the Ministry of Electronics and Information Technology (MeitY). This platform is dedicated to helping the Indian workforce acquire critical digital skills across emerging technologies, including artificial intelligence (AI), cloud computing, cybersecurity, blockchain, and data analytics. NASSCOM has successfully trained over 500,000 participants through this platform to date.¹¹⁴

112 [PMKVY Official, About PMKVY, 2021.](#)

113 Ibid.

114 [Futureskills, What is Futureskills?, 2024.](#)

Gaps and Opportunities

Essential Skilling Clusters in India include **People with Low Digital Literacy, Migrant and Informal Workers, Racial/Ethnic Minorities**, and **Recent Graduates and Young Adults**.¹¹⁵ These groups are not only significantly represented but also exhibit a higher relative prevalence compared to the average across all focal markets. India is also one of the most mentioned markets concerning Women.

The digital divide remains a significant challenge, particularly for women in rural areas, who often lack access to essential digital tools like laptops and tablets,¹¹⁶ which are crucial for advanced skill development. Women in these communities often do not own or know how to use even basic mobile phones, underscoring the stark inequalities in digital access.¹¹⁷ Similarly, India's large informal workforce—dominated by industries such as textiles, leather, and packaging—stands to benefit significantly from AI skilling as AI adoption continues to expand.

Micro, Small, and Medium Enterprises (MSMEs), which contribute 45% of industrial production, 40% of exports, and nearly 38% of GDP, are at a critical juncture in their AI transition. While 94% of MSMEs are currently tech-enabled¹¹⁸ and are keen on leveraging AI for process optimisation and product development, many face challenges like limited awareness and financial constraints. Initiatives such as NASSCOM and Meta's AI Enablement for MSMEs provide much-needed training, resources,¹¹⁹ and accessible technologies to bridge these gaps. Government programmes like Responsible AI for Youth and AI education in schools aim to build a future-ready workforce.

115 Consolidating the market representation of essential skilling clusters (Appendix A) and the comparison of essential skilling clusters per market (Figure 8).

116 As extracted from expert interviews.

117 As extracted from expert interviews.

118 [SME Chamber of India, About SMEs in India, 2020.](#)

119 [Meta, New Insights to Help India's MSMEs Use AI to Drive Growth, 2024.](#)

Indonesia



Since the National Strategy for Artificial Intelligence was released in 2020, Indonesia has made strides in enhancing digital skills and workforce development.¹²⁰ However, there remains a pressing need to bridge the significant digital divide. Indonesia's decentralised governance system has created a fragmented approach to policy discussions and implementation, which impedes workforce transformation.¹²¹

Digital literacy programmes for low-income communities and rural residents like The Kartu Prakerja (2020) and The Digital Village programme (2023) are aimed at addressing this gap.^{122, 123} However, with about 60% of the population having only completed junior high school, the ability of the workforce to upskill themselves is limited. The government and educational institutions are working to incorporate AI skills into more relevant and market-linked curricula to improve this situation.

120 [Government of Indonesia, National Strategy for AI, 2020.](#)

121 As extracted from expert interviews.

122 [Prakerja, Contribute to the enhancement of workforce skills, 2024.](#)

123 [Antara Indonesian News Agency. 2024. Ministry targets digitalizing all Indonesian villages by 2025.](#)

Some Key Policy Initiatives

The National AI Strategy

A roadmap from 2020 to 2045 aimed at developing a robust digital ecosystem in Indonesia. It includes enhancing educational infrastructure and resources to support skill development in AI. By 2045, Indonesia aims to prepare 9 million individuals as skilled digital resources.

The Kartu Prakerja Programme

A government initiative launched in 2020 offering vocational training to unemployed individuals, enhancing their employability amid economic challenges exacerbated by AI advancements.

Digital Talent Scholarship Programme

A government initiative launched in 2018 that collaborates with tech companies like AWS, this programme aims to equip young Indonesians with digital skills, including AI competencies.¹²⁴ In 2023, this programme featured eight academies working to build competent and superior digital talents.¹²⁵

Other Skilling Initiatives

- **Indonesian Artificial Intelligence Society (IAIS):** The IAIS is a private organisation dedicated to advancing AI research, development, and education in Indonesia. The society was founded to build a robust AI ecosystem in Indonesia by connecting researchers, industry professionals, policymakers, and educational institutions. The IAIS's training efforts include AI talent development initiatives for students, AI training and certification programmes, and ethical and responsible AI development. Through various workshops, webinars, and conferences, the IAIS has reached over 10,000 individuals nationwide.

¹²⁴ Digitalent, Digital Talent Scholarship, 2024.

¹²⁵ Antara Digital News Agency, Digital Talent Scholarship programme has eight academies, 2023.

- **Pijar Foundation:** A private sector organisation focusing on digital and AI skills development, targeting a range of audiences, from students to professionals, to prepare them for the evolving demands of the digital and AI-driven landscape. The Pijar Foundation's Future Skills programme, implemented in 2021, is central to the organisation's mission to bridge the gap between education and employment. This programme provides young Indonesians with digital skills training and career readiness, enabling them to compete better in tech-related fields. It includes practical workshops, hands-on training, and collaborations with industry experts. This programme has successfully empowered over 43,000 beneficiaries with digital and future-ready skills.¹²⁶

Gaps and Opportunities

Over half of all identified essential skilling clusters are overrepresented in Indonesia.¹²⁷ These groups include **People with Low Digital Literacy, Migrant and Informal Workers, PWDs, Recent Graduates and Young Adults, Job Seekers and Career Changers,** and **Racial/Ethnic Minorities.** These groups are especially prominent in Indonesia, where they are more prevalent than other focal markets.

Experts have highlighted concerns about the Indonesian workforce's ability to adapt to AI-driven transitions, citing generally low education levels and limited skill sets.¹²⁸ The government's approach to AI adoption and skilling has primarily targeted the industry and the business sector, emphasising enhancing productivity in large corporations. However, with a significant portion of the population having completed only junior high school, workforce quality remains constrained by low digital literacy and limited educational attainment.

Addressing this challenge requires a dual focus: improving foundational education in AI and creating robust pathways to technical and digital proficiency. By enhancing human resource quality and overhauling the education system, Indonesia can better support AI-driven advancements and equip its workforce to thrive in an evolving technological landscape.



In Indonesia, the biggest complexity is in the lack of synergy within the government... the issue is that the different ministries are so divided, and they don't work in synergy.

— DIRECTOR OF PUBLIC POLICY, PIJAR FOUNDATION, INDONESIA

¹²⁶ [Katadata, Three Pijar Foundation Programmes Reach 45 Thousand Beneficiaries, 2023.](#)

¹²⁷ Consolidating the market representation of essential skilling clusters (Appendix A) and the comparison of essential skilling clusters per market (Figure 8).

¹²⁸ As extracted from expert interviews.

Japan



Japan's approach to AI skilling and workforce transformation is characterised by a comprehensive strategy integrating public funding, educational initiatives, and international collaboration. This includes robust funding and investment support for startups and SMEs in adopting AI technologies through initiatives like the DCON Start-Up Fund and AI Introduction Subsidy.¹²⁹ The government also provides substantial subsidies for young researchers and reskilling grants for SMEs, promoting ongoing workforce development. Legislative actions, including the proposed Basic Act on the Advancement of Responsible AI (2025), focus on establishing a regulatory framework for AI systems and fair labour practices. International collaborations, such as the US-Japan AI Partnerships, ensure alignment with global standards and emphasise ethical guidelines and responsible AI development.¹³⁰

Programmes such as the Digital Talent Cultivation Initiative (2021) and the GIGA School Programme (2018) aim to enhance ICT skills and provide improved access to technology for all students.¹³¹

¹²⁹ [TOPY, Sponsoring "DCON2024", a business creation contest for technical college students, 2024.](#)

¹³⁰ [U.S. Embassy & Consulates in Japan, Unites States and Japan Announce Two New University-Corporate AI Partnerships Worth \\$110 Million, 2024.](#)

¹³¹ [Equity Ed Hub, Japan's GIGA School Programme equips students for digital society, 2021.](#)

Educational integration is a significant focus, with the Mathematics, Data Science, and AI Education Programme Certification promoting AI literacy from primary to higher education. Continuous learning is supported by platforms like Aidemy, which align with METI's digital skill standards.¹³² The government also invests heavily in infrastructure development, ensuring widespread access to digital learning tools through the GIGA School Initiative.

The private sector contributes to workforce readiness through training programmes and entrepreneurship courses, while sector-specific initiatives enhance productivity in agriculture, manufacturing, and services, addressing demographic challenges.

Other Skilling Initiatives

Givery Inc.

A private sector company specialising in digital transformation solutions across various sectors. Givery actively promotes AI and digital skills through initiatives such as coding test platforms for recruitment and skill assessment, hackathons, and training sessions for students entering employment. These events are hosted in collaboration with national universities and Japan's Digital Agency, providing students with real-world challenges to solve and helping them practise coding, teamwork, and innovation in a competitive, hands-on environment.

Fujitsu

Fujitsu has launched several workforce skilling and development programmes to prepare employees for Japan's evolving digital landscape, focusing on skills such as artificial intelligence (AI), cloud computing, and cybersecurity. In partnership with universities and other tech companies, Fujitsu offers training programmes focusing on AI and machine learning through The Digital Knowledge Transfer Project (2021), which targets students and young professionals in Japan, aiming to build a strong talent pipeline in advanced digital fields.¹³³

¹³² [Aidemy, Expanding the possibilities for people and organisations with cutting-edge technology, 2024.](#)

¹³³ [Fujitsu. 2024. Fujitsu Launches Global Strategic Partner Academy Programme to Tackle Global IT Skills and Experience Shortage.](#)

Key Policy Initiatives

- **National AI Strategy:** The Japanese government created this strategy in June 2019. Its goals are to train 250,000 AI professionals by 2025 and achieve full automation in logistics by 2030.¹³⁴ The Japanese government has allocated significant funding to support these initiatives.
- **The AI Engineer Development Policy:** As outlined under Japan's AI Strategy (2022),¹³⁵ this policy aims to cultivate skilled AI professionals through targeted training partnerships, enhancing technological capabilities within Japan's labour market.
- **Japan Reskilling Consortium:** Launched in 2022 with support from Google, this initiative involves collaboration between national government and private sector companies.¹³⁶ This initiative addresses labour shortages and skill gaps, successfully registering over 1,000 individuals for AI-related training programmes.

Gaps and Opportunities

Among the eight focal markets, Japan has one of the lowest numbers of essential skilling clusters.¹³⁷ The most prominent group identified is the **Elderly and Mature Workforce**. Japan's ageing population presents a significant opportunity for targeted initiatives to equip this demographic with AI-related skills, facilitating continued employment and addressing important workforce gaps.¹³⁸



In Japan, the main problem is the big age gap and large ageing population. There are no issues regarding infrastructure or good education, but it is a culturally very rigid society with a lot of older people or older generations. Unfortunately, many of the elderly communities do not use even basic technology such as card machines.

— EXECUTIVE DIRECTOR, ARTIFICIAL INTELLIGENCE AND
CYBER FUTURES INSTITUTE, JAPAN AND AUSTRALIA

134 [Government of Japan—Cabinet Office, AI Strategy, 2022.](#)

135 [ibid.](#)

136 [Economist Impact, Bridging the skills gap: Fuelling careers and the economy in Japan, 2023.](#)

137 Consolidating the market representation of essential skilling clusters (Appendix A) and the comparison of essential skilling clusters per market (Figure 8).

138 As extracted from expert interviews.

Experts have also highlighted refugees, particularly single mothers within this (refugee) community, as a priority community with unmet needs.¹³⁹ Refugees in Japan face challenges such as securing stable housing, which often hinders their ability to obtain full-time employment. Programmes that combine training with the possibility of pursuing career opportunities are seen as an effective solution, enabling these individuals to work while concurrently acquiring new skills.

¹³⁹ As extracted from expert interviews.

Singapore



Singapore has made considerable financial and structural investments to foster a digitally proficient society. This is evident through substantial public funding, strategic partnerships, and the integration of digital education to transform and build workforce capacity. While there are no stringent regulations, Singapore's National AI Strategy (launched in 2019) and Model AI Governance Framework (2024) set ambitious goals to enhance local AI expertise and stimulate innovation.^{140, 141} With a USD 1 billion investment, the government aims to increase the number of AI practitioners to 15,000 by 2029, targeting sector-specific skills in healthcare, finance, and manufacturing. The government is also mindful of communities with unmet needs, such as the mature workforce close to retirement, who may not easily access available opportunities. Efforts are being made to ensure they have access and training.

¹⁴⁰ [Smart Nation Singapore, National AI Strategy, 2023.](#)

¹⁴¹ [Infocomm Media Development Authority, Singapore proposes framework to foster trusted Generative AI development, 2024.](#)

Singapore stands out regarding workforce readiness and government efforts to ensure AI upskilling and reskilling for the population.¹⁴² These country-level efforts began many years ago with the SkillsFuture initiative and increasingly include preparation for AI-driven workforce transitions. The country's approach to ensuring workforce development and readiness is unique in that the government is targeting the unique training needs of each sector rather than a more general upskilling effort for the workforce as a whole. The question being asked is, "What are the contextual training needs of the manufacturing, services, and healthcare sectors?"¹⁴³

There is also a significant focus on developing a thriving ecosystem, evidenced by various government subsidies, substantial public funding, strategic partnerships, and educational integration to encourage citizens to upskill and remain competitive in their fields.¹⁴⁴

Key Policy Initiatives

National AI Strategy 2.0

Launched by the government in December 2023 and backed by a USD 1 billion investment over five years, this strategy aims to triple the workforce skilled in AI technologies by 2029.

The SkillsFuture Singapore

This ongoing government initiative, which started in 2015, offers financial support for Singaporeans pursuing skills development in high-demand areas like AI. As part of this initiative, the SkillsFuture Credit provides up to USD 4,000 for mid-career workers to refresh their skills, ensuring adaptability in a changing job market.¹⁴⁵

The Data + AI Boost SME Programme

Launched in May 2024 and supported by Salesforce and IMDA, this programme aims to empower 5,000 SMEs by providing training on trusted AI and data utilisation.

¹⁴² As extracted from expert interviews.

¹⁴³ As extracted from expert interviews.

¹⁴⁴ As extracted from expert interviews.

¹⁴⁵ [SkillsFuture, About SkillsFuture Singapore, 2024.](#)

Other Skilling Initiatives

- **Tech Skills Accelerator (TeSA):** A flagship initiative by the Infocomm Media Development Authority (IMDA) in partnership with SkillsFuture Singapore and Workforce Singapore (WSG). Launched in 2016, TeSA aims to enhance the tech skills of Singapore's workforce and address the growing demand for Infocomm Technology professionals.¹⁴⁶ The programme is a central pillar in Singapore's strategy to build a digitally skilled workforce. TeSA aligns its programmes with in-demand skills like AI and machine learning, cybersecurity, and data science and analytics.
- **AI Singapore:** A national programme launched in 2017 by the National Research Foundation (NRF) in Singapore, focusing on strengthening the country's artificial intelligence (AI) and data science capabilities. The goal of the programme is to support digital skilling by helping Singaporeans gain expertise in AI, machine learning, and data analytics, which are crucial for the digital economy. AI for Everyone (AI4E) is an introductory programme offered by AI Singapore which aims to raise awareness and understanding of AI among the general public. It includes basic workshops that cover the fundamentals of AI and machine learning and introduces participants to how AI is used across different sectors.¹⁴⁷



Of all the focus countries, Singapore would certainly be at the top in terms of its willingness to invest in the population in training... there really is a comprehensive government approach to this.

— SENIOR DIRECTOR OF AI GOVERNANCE, AI SINGAPORE, SINGAPORE

¹⁴⁶ [Infocomm Media Development Authority, 2024, TechSkills Accelerator \(TeSA\), 2024.](#)

¹⁴⁷ [AI Singapore, AI for Everyone, 2024.](#)

Gaps and Opportunities

Singapore began preparing its workforce for the impact of automation and AI nearly a decade ago. Consequently, it is among the markets with the lowest prevalence of essential skilling clusters. However, **Racial and Ethnic Minorities**, including the city-state's 1.4 million foreign workers in 2019—of whom 999,000 were low-wage work permit holders¹⁴⁸—remain a significant community with unmet needs. While Singapore's SkillsFuture Initiative provides subsidised training for citizens and residents, migrant workers are excluded from this programme, forcing them to bear the full cost of upskilling—a potentially significant financial burden.

Experts have highlighted a gap in skilling opportunities for educators, even as significant efforts have focused on upskilling students and recent graduates. Teachers in Singapore increasingly demand digital upskilling and reskilling opportunities, particularly for integrating AI tools into education.¹⁴⁹ To address this, the Ministry of Education has introduced the Teacher Work Attachment Plus Programme, which equips teachers to become future-ready and better prepared to guide students in navigating a changing work landscape.



Teachers came to us and told us it's great that we have all these skilling programmes for students, but we as teachers are not confident enough... we need programmes that equip us with using digital tools like AI in education.

— HEAD OF PROGRAMMES, AI SINGAPORE, SINGAPORE

¹⁴⁸ Centre for Strategic and International Studies, *Artificial Intelligence and the Future of Singapore's Foreign Workforce*, 2024.

¹⁴⁹ As extracted from expert interviews.

South Korea



South Korea's multifaceted approach focuses on workforce readiness and capacity building, setting clear policy targets and involving diverse stakeholders to enhance productivity and ensure improved access to technology-driven education solutions. The Talent Innovation Act (2021) established a legal framework for systematic skill development in strategic high-tech sectors, including AI.¹⁵⁰ The National AI Strategy Council coordinates efforts across sectors to manage AI's societal impact while promoting ethical considerations and governance. The government backs significant AI skilling programmes, such as the AI Voucher Programme (2023),¹⁵¹ which supports SMEs in adopting AI technologies, and infrastructure projects like the Gwangju AI Cluster Project to foster an AI ecosystem through public-private partnerships.¹⁵² International agreements, such as the Korea-Canada AI Cooperation Agreement (2016), further bolster these efforts through joint research and workforce training.

¹⁵⁰ [Library of Congress, South Korea: Special Act on High-Tech Industry Talent Innovation Promulgated, 2024.](#)

¹⁵¹ [Smart Times, The Ministry of Science and ICT has invited AI voucher support projects, 2023.](#)

¹⁵² [KoreaTechDesk, Gwangju's Artificial Intelligence Industry Cluster Agency \(AIICA\) Shaping South Korea's Rise as an AI Superpower, 2024.](#)

South Korea prioritises digital literacy and AI integration through various initiatives, including the Digital Care Experience Bus Programme, targeting populations like the elderly and disabled.¹⁵³ In education, AI is incorporated into curricula from primary schools to universities, with institutions like Seoul National University aligning their AI courses with industry needs.

In the private sector, initiatives like the Seoul AI Business Pledge (2024) encourage tech companies to collaborate with SMEs for responsible AI development.¹⁵⁴ Sector-specific initiatives, such as the Smart Livestock 2nd Generation Transition Policy (2024), aim to integrate AI technologies in agriculture, manufacturing, and services, upskilling workers accordingly.¹⁵⁵

Key Policy Initiatives

AI Talent Development Initiative

The South Korean government aims to produce over 130,000 skilled professionals by 2025, with support from the government's Ministry of Science and ICT and major corporations like Samsung.

The Digital Transition Labour Market Policy

Implemented in July 2021 and focused on mitigating the effects of automation, this policy aims to support workers who may lose their jobs due to AI technologies. Key components include expanding safety nets and promoting upskilling initiatives for mid-career professionals.

AI Professional Training Programme

This government-backed initiative provides free AI-related training programmes to residents and recent graduates.

153 [Seoul Metropolitan Government, Elderly Care Becomes Smart in Seoul by Using Robots and AI Technology to Keep Seniors Healthy and Safe, 2024.](#)

154 [AI Seoul Summit, Seoul AI Business Pledge, 2024.](#)

155 [FFTC Agricultural Policy Platform, Major Policy Plans for 2024 of the Ministry of Agricultural, Food and Rural Affairs in Korea, 2024.](#)

Other Skilling Initiatives

- **Seoul Digital Foundation (SDF):** Established by the Seoul Metropolitan Government in 2016, the SDF prioritises bridging the digital divide for senior citizens through digital literacy programmes. The foundation adopts peer-based learning, where tech-savvy seniors train their peers in digital skills. One of its innovative approaches, particularly for seniors, involves using robots in community centres to provide personalised, easy-to-follow digital education sessions, helping thousands of elderly participants learn to use digital devices and services. This method alone has reportedly trained around 3,000 seniors. Annually, the foundation trains approximately 20,000 people across its various programmes.¹⁵⁶
- **Kakao Corporation:** Founded in 2010, Kakao Corporation is a major South Korean tech company known for its diverse digital services. The company offers AI and digital skills development, both internally and as part of broader initiatives to support South Korea's tech ecosystem. The Kakao AI Campus is Kakao Corporation's dedicated facility for research, development, and education in artificial intelligence. The campus offers AI and machine learning education programmes for Kakao employees and external participants. Kakao hosts hands-on workshops, seminars, and certification courses at the AI Campus, with topics ranging from AI programming to ethical considerations in AI development. Since its launch in 2021, the campus has trained a total of 6,000 participants in essential AI knowledge and tools, targeting Kakao employees, students, developers, and professionals.¹⁵⁷

Gaps and Opportunities

South Korea has a relatively low prevalence of essential skilling clusters compared to other focal markets.¹⁵⁸ However, similar to Japan, the **Elderly and Mature Workforce** stands out.

With the world's second-highest life expectancy and the lowest recorded fertility rate,¹⁵⁹ South Korea faces a rapidly ageing population and a workforce that increasingly extends into older age. There is a significant opportunity to empower mature workers by addressing the gaps in AI literacy, expanding access to reskilling opportunities, and creating tailored initiatives to help them navigate an increasingly competitive job market. By providing targeted support, these workers can adapt to technological advancements and remain valuable contributors to the workforce.

156 [ITU, Robots deliver digital skills training to Seoul's senior citizens, 2020.](#)

157 [Kakao AI Campus, AI era with infinite possibilities, a space for talents to grow, 2023.](#)

158 Consolidating the market representation of essential skilling clusters (Appendix A) and the comparison of essential skilling clusters per market (Figure 8).

159 [Statista, Aging population in South Korea—statistics & facts, 2024.](#)

Taiwan



Taiwan's government is dedicated to building a skilled workforce and ecosystem through various initiatives and substantial funding for training in AI-related industries. The new government, which took office in May 2024, has renewed its focus on talent cultivation, particularly in AI literacy.¹⁶⁰ The government is investing significant resources into AI research and development and skill-building initiatives. The aim is to use AI within industries and to industrialise AI itself.¹⁶¹ The Committee of Science and Technology has recently released a draft of the AI Basic Law, which serves as a preliminary ethical framework for AI development and talent cultivation and guides government policy discussions around AI.

Collaborations among tertiary institutions have led to the development of an AI literacy programme to prepare students from various fields for the workforce. For instance, The AI Talent Development Goal aims to train 200,000 professionals by 2028.¹⁶²

¹⁶⁰ As extracted from expert interviews.

¹⁶¹ As extracted from expert interviews.

¹⁶² [IEEE Spectrum, Taiwan's AI Goals Will Need More Tech Talent, Hoping to expand its AI footprint, Taiwan looks to attract foreign talent, 2024.](#)

A significant partnership between NVIDIA and the Taiwanese government to establish the NVIDIA AI Research Team seeks to enhance AI research and industry-academia collaboration, thereby creating job opportunities and boosting Taiwan's global AI standing. Additionally, collaborations among tertiary institutions have led to the development of an AI literacy programme to prepare students from various fields for the workforce.

Key Policy Initiatives

AI Talent Development Goal

This initiative aims to train 200,000 professionals by 2028, which involves collaboration between government bodies and educational institutions.

AI Basic Law

This law establishes a regulatory framework for ethical AI development, focusing on safety, accountability, and transparency. It also promotes talent cultivation among local professionals, government bodies, industry leaders, and academic institutions. This draft bill was published in July 2024.

Digital Talent Demand Policy

This policy addresses the need for skilled workers in technology sectors, especially AI engineers. It involves collaboration between employers and educational institutions to align training programmes with industry requirements.

The Foreign Trade Association

This initiative focuses on enhancing the international competitiveness of MSMEs through AI. It involves developing a trade data platform that provides customised trade insights, along with workshops and mentorship programmes to help businesses reduce AI adoption anxiety and improve their digital capabilities.¹⁶³

¹⁶³ [United Daily News, 北市兩地都更審議通過 改建千戶社會住宅, 2024](#)

Other Skilling Initiatives

- **Taiwan AI Academy (TAIA):** With a diverse curriculum, the academy offers programmes ranging from technical and management courses to industry-specific modules such as smart healthcare, smart manufacturing, and edge AI. The programmes emphasise practical learning and proof-of-concept projects, targeting students entering into employment and young professionals. Since its inception, TAIA has trained over 8,000 professionals through its campuses.¹⁶⁴
- **NVIDIA-National Taiwan University (NTU) Artificial Intelligence Joint Research Center:** NVIDIA is actively involved in advancing AI and digital skills in Taiwan through multiple initiatives in collaboration with local institutions. A prominent example is its partnership with National Taiwan University (NTU), where NVIDIA established the NVIDIA-NTU Artificial Intelligence Joint Research Center in 2023. This centre aims to foster AI talent by conducting interdisciplinary research and training for students, as well as encouraging AI applications across various sectors. This initiative trains NTU instructors to integrate AI into their curricula, promoting both educational and technological innovation among students and faculty.¹⁶⁵

Gaps and Opportunities

In Taiwan, the key essential skilling clusters include **Recent Graduates and Young Adults**, as well as the **Elderly and Mature Workforce**.¹⁶⁶

Like South Korea and Japan, Taiwan faces significant challenges related to its ageing population, with Taiwan projected to become a “super-aged society” (where 20% or more of the population is 65 or older) by 2025. This places Taiwan among the fastest-ageing nations globally.¹⁶⁷ In response, the Education Ministry has launched a digital learning programme aimed at helping seniors adapt to the digital age.¹⁶⁸ Additionally, the Ministry of Education, Ministry of Digital Affairs, Ministry of Health, and other agencies are collaborating on a comprehensive government strategy to address the challenges an ageing population poses. The Education Ministry is currently in the third phase of its mid-term plan for senior education, which aims to create a learning environment that eliminates age discrimination, bridges intergenerational gaps, and narrows the digital divide.

¹⁶⁴ [Taiwan AI Academy, AI in Taiwan, 2022.](#)

¹⁶⁵ [NVIDIA-NTU Research Center, NVIDIA-NTU Artificial Intelligence Joint Research Center, 2023.](#)

¹⁶⁶ Consolidating the market representation of essential skilling clusters (Appendix A) and the comparison of essential skilling clusters per market (Figure 8).

¹⁶⁷ [Asia Times, Taiwan fast graying into a ‘super-aged’ society, 2023.](#)

¹⁶⁸ [Radio Taiwan Intl, Taiwan launches digital learning demonstration centers to support elderly, 2024.](#)

Vietnam



Vietnam's approach to AI skilling and workforce transformation is defined by a strategic blend of public funding, international collaboration, and private-sector engagement. Government support is further demonstrated through legislative actions such as Decision No. 749/QĐ-TTg 2020 on Digital Transformation, which promotes digital skills across sectors.¹⁶⁹ Policies like the Law on Foreign Investment (2020) attract foreign direct investment that contributes to skill enhancement through training programmes and scholarships.¹⁷⁰ As seen in Da Nang's enterprise-training centre linkage initiative, infrastructure development is also fostered to align educational outputs with industry demands.¹⁷¹

Initiatives like the Universalising Digital Skills Project (2020) and Inclusive Digital Literacy Project (2023) aim to enhance digital capabilities across various groups, ensuring comprehensive access to technology and necessary skills for participation in the digital economy.¹⁷² Educational integration is a key focus, with AI being incorporated into curricula at multiple academic levels. Programmes such

169 [LuatVietnam, Decision No. 749/QĐ-TTg 2020 national digital transformation programme through 2025, 2020.](#)

170 [Socialist Republic of Vietnam, Law on Investment, 2020.](#)

171 [VietnamPlus, Da Nang IC, AI research and training centre established, 2023.](#)

172 [OpenDevelopment Vietnam, Vietnam Digital Transformation Agenda, 2023.](#)

as the ASEAN Youth for Digital Action (AYDA) empower youth with essential digital skills through structured training, including boot camps and internships.¹⁷³ At the same time, local universities offer AI-related courses within their computer science programmes to prepare students for future job markets.

Funding and investment are crucial in supporting these initiatives. The VinAI Residency Programme represents a sustainable investment in AI talent development. International collaborations, such as partnerships between Naver and Hanoi University of Science and Technology, establish research centres focused on advancing AI technologies and ensure Vietnam remains competitive in the Southeast Asian tech landscape.¹⁷⁴ Sector-specific initiatives, like precision farming training programmes, aim to modernise agricultural practices using data analytics for improved productivity.

Key Policy Initiatives

National AI Strategy

This strategy aims to establish the country as an AI innovation hub by 2030. It will prioritise funding for computing centres and educational frameworks related to AI technologies.¹⁷⁵ The government released the strategy in January 2021.

VinAI Residency Programme

Launched in 2019 and aimed at nurturing AI talent, this programme intends to address the local talent gap in artificial intelligence through training and scholarship opportunities.¹⁷⁶

Vocational Education Law (2014)

This law focuses on developing vocational training programmes that align with industry demands, encouraging partnerships between vocational schools and businesses to integrate technological advancements, including AI.¹⁷⁷

173 [ASEAN Youth for Digital Action, Preparing ASEAN Youth for The Digital Transformation Era, 2023.](#)

174 [Hanoi University of Science and Technology, Cooperation Between HUST and NAVER Will Open Up A New Future, 2023.](#)

175 [Ministry of Science and Technology, Vietnam makes efforts to promote responsible AI development, 2024.](#)

176 [VinAI, Nurturing Young AI Talents and Leaders, 2024.](#)

177 [Socialist Republic of Vietnam, Law on Vocational Education, 2014.](#)

Other Skilling Initiatives

- **Vietnet Information and Communication Technology (ICT) Foundation:** A non-profit organisation providing access to technology and digital skills for disadvantaged groups in Vietnam. The organisation offers various programmes targeting communities with unmet needs, focusing on digital literacy, safety, and other key ICT skills. They implement three programmes that contribute to narrowing the digital gap: digital skills for youth, ICT for non-profit organisations, and ICT in the community. Each programme focuses on addressing specific problems with a customised intervention strategy. Vietnet-ICT Foundation has reached over 1.5 million people through its programmes.¹⁷⁸
- **FPT Corporation:** A major Vietnamese technology company well-known for its contributions to digital transformation, IT services, and tech solutions for both local and global markets. FPT Corporation prioritises investment in nurturing digital talent and fostering innovation in advanced tech. The company has invested heavily in skilling its workforce and offers training programmes through FPT Software Academy, which focuses on preparing young IT talent and experienced professionals. The academy trains approximately 5,000 IT professionals annually, equipping them with skills in software engineering, AI, and emerging tech trends.¹⁷⁹

Gaps and Opportunities

The essential skilling clusters in Vietnam include **People with Low Digital Literacy, Migrant and Informal Workers**, and **Recent Graduates and Young Adults**.¹⁸⁰ Among these, **people with low digital literacy** are the most notable group, being significantly overrepresented in Vietnam compared to other focal markets. When coupled with appropriate reskilling and upskilling opportunities, an AI Just Transition can offer substantial benefits for low-income workers, women, and individuals with lower educational attainment. While Women are the most significant group in terms of absolute volume across most focal markets, in Vietnam, the most prevalent group facing challenges is individuals with low digital literacy. This is largely due to a notable skills gap, compounded by insufficient educational infrastructure capable of producing graduates with the necessary expertise. Many universities in Vietnam struggle to meet the high demand for IT professionals, resulting in a shortage that impacts local companies and foreign investors seeking talent. It is estimated that Vietnam has only around 300 AI specialists to meet the growing needs of various sectors,¹⁸¹ underscoring the urgent need for widespread AI skilling initiatives.

178 [Vietnet-ICT, We Think Digital, 2023.](#)

179 [FPT Software, FPT Software Academy accompanies you in developing your career, 2024.](#)

180 Consolidating the market representation of essential skilling clusters (Appendix A) and the comparison of essential skilling clusters per market (Figure 8).

181 [Vietnamet Global, Vietnam has only 300 artificial intelligence experts, 2021.](#)

Designing Effective AI-Skilling Initiatives

This section highlights the key lessons drawn from the thousands of skilling efforts analysed in this study. These initiatives were examined, categorised, and distilled into seven core principles for programme efficacy. These principles are further informed by the challenges and preferences shared by members of the identified Essential Skilling Clusters, as discussed in Section 4.

The principles are organised into the following categories:

Programme Design

Focuses on how programmes are structured to maximise reach and effectiveness.

- **Principle 1: Ensure Access**
Ensuring Affordable and Accessible Learning Resources for Communities with Unmet Needs
- **Principle 2: Be Targeted**
Targeted Recruitment and Community Engagement to Bridge AI Skill Gaps
- **Principle 3: Measure Outcomes**
Measuring Programme Outcomes for Continuous Improvement

Programme Content

Focuses on what is being taught to ensure job readiness and ethical considerations.

- **Principle 4: Foster Job-Readiness**
Emphasising Practical AI Skills and Job-Oriented Training and Certification
- **Principle 5: Include Ethical Lens**
Integrating Ethical AI and Accessible AI into Skilling Opportunities

Beyond Content

Focuses on Strengthening Ecosystems for Sustainable Learning.

- **Principle 6: Enable Continuity**
Establishing Continuous Learning and Support Systems Through Mentorship and Networking
- **Principle 7: Leverage Collaboration**
Collaborating with Local Partners, Industry Experts, and Educational Institutions

Principle 1

Ensure Access: Ensuring Affordable and Accessible Learning Resources for Communities with Unmet Needs

The best practice programmes demonstrate that providing free, low-cost, and flexible access to learning resources in local languages is crucial to making AI and digital skills training accessible, particularly for communities with unmet needs. **Simplilearn Solutions** and the **Infosys Foundation**, both examples from India, are exemplary in offering affordable digital skills training platforms that remove financial barriers. These platforms empower participants to acquire AI skills without the burden of tuition fees, ensuring that even those from financially constrained backgrounds can participate in AI-driven learning without the cost being a limiting factor.

In addition to financial accessibility, hybrid learning models implemented by institutions like **AI Singapore** and the **Futuretech Institute** make education more accessible by blending online and in-person formats. This allows individuals who may face geographical or technological constraints to engage in AI training effectively. Combining live classes, on-demand content, and hands-on labs, hybrid models cater to a range of learning styles and personal schedules, making training more flexible. Public services like libraries could also provide a unique dimension of accessibility by fostering learning environments specifically tailored for communities with unmet needs. Initiatives like **Australia's SSI digital literacy courses** address specific regional challenges, ensuring that mature-aged refugees gain access to pertinent training.¹⁸² Complementing this, **Singapore's 'Digital for Life' movement** enables cross-generational learning, thereby engaging diverse age groups in digital skill development.¹⁸³ These initiatives demonstrate how leveraging community spaces can help ensure digital literacy is accessible to all, further empowering communities with unmet needs through shared learning experiences.

Hybrid learning blends live classes, on-demand content, and hands-on labs, offering flexible AI training that overcomes barriers like geography and fosters inclusive, community-driven education.

¹⁸² SSI, [SSI Digital Literacy Course Gives Mature-Aged Refugees Better Education, Employment Opportunities, 2023](#).

¹⁸³ *ibid.*

Principle 2

Be Targeted: Targeted Recruitment and Community Engagement to Bridge AI Skill Gaps

Many of the best practice programmes in the analysis use targeted recruitment and community engagement to reach communities with unmet needs and those traditionally underrepresented in the tech sector. Community engagement campaigns, such as those run by the **International Solar Alliance**, effectively raise awareness about the importance of AI and digital skills in today's workforce, driving participation from individuals who may not have been aware of available opportunities. **Coursera** collaborates with local NGOs to foster trust and further connect underrepresented groups to AI training programmes.

Principle 3

Measure Outcomes: Measuring Programme Outcomes for Continuous Improvement

Measuring the impact and outcomes of training programmes is crucial for ensuring their effectiveness and continuous improvement. The best practice case studies used for this analysis track enrollment figures, completion rates, job placement outcomes, post-training confidence levels, and metrics on how well participants transition into the workforce. For example, **Tafe Queensland** tracks job placement rates in the Australian state to evaluate how effectively their training helps participants secure employment. Similarly, the **Ministry of Education and Culture in Indonesia** tracks its programmes' retention and completion rates to ensure that they remain effective and relevant.

The analysis also highlights the importance of incorporating feedback-driven iteration, which enables programmes to refine their offerings based on participant experiences. **Aidemy Inc.** uses participant feedback to ensure the training remains responsive to evolving needs. As seen in **FPT Software**, setting targeted skill development goals—such as the number of participants trained or specific skills acquired—helps maintain accountability. Such measures can be effective in addressing the unique challenges of a diverse workforce, including those highlighted by workers in Essential Skilling Clusters.

Principle 4

Foster Job-Readiness: Emphasising Practical AI Skills and Job-Oriented Training and Certification

Specific to content and curriculum development, the analysis points to the importance of focusing on practical skills and job-oriented training. Treating AI as a tool rather than a theoretical framework enables participants to engage with practical applications, directly enhancing their employability. It equips learners with the hands-on expertise required to meet industry demands. Programmes like **FutureSkills Prime in India**, which has trained nearly 1.4 million learners across 2,000 colleges and 100 corporates with 42% female participation, and **Indonesia's Digital Talent Scholarship**, which has reached 250,000 participants with 48% female participation, demonstrate the value of combining technical training with recognised certifications. These programmes provide industry-relevant skills and credentials that boost participants' competitiveness in the job market.

Offering recognised certifications, like those from Microsoft and Salesforce, significantly enhances participants' employability in competitive job markets.¹⁸⁴ According to Skillssoft, the introduction of digital badges has further increased the appeal of learners to potential employers.¹⁸⁵

Principle 5

Include Ethical Lens: Integrating Ethical AI and Accessible AI into Skilling Opportunities

Several skilling organisations emphasise the need to incorporate ethical and sustainable AI as crucial perspectives in AI training programmes. By integrating ethical frameworks into AI education, learners can better understand the broader societal impacts of AI technologies, such as data privacy, algorithmic bias, and transparency. For instance, training programmes like **Coursera's** AI ethics courses provide learners with insights into these issues, equipping them with the knowledge to navigate ethical challenges responsibly. Integrating discussions on ethical AI practices within the curriculum to foster responsible engagement with technology is essential. According to UNESCO, emphasising the ethical implications of AI in training programmes prepares participants to critically assess AI technologies, ensuring they are not only technically proficient but also socially responsible.

¹⁸⁴ [Microsoft, Get digital skills for in-demand jobs: free training and low-cost certifications available now, 2020.](#)

¹⁸⁵ [Skillssoft, Announcing Digital Badges: Boost Learner Engagement with Company-Branded Credentials, 2022.](#)

Tailored approaches, such as those implemented by **Schneider Electric**, which focuses on sustainability and ethical AI practices, aim to empower communities to engage with AI in a manner that promotes improved access. Integrating ethical considerations into AI education requires a multifaceted approach prioritising accessibility and outreach to communities with unmet needs. Programmes should be designed to specifically address the unique needs of these workers, including persons with disabilities and those from low-income backgrounds, ensuring access to AI education through tailored content and delivery methods. Initiatives like **Google AI for Everyone** can serve as models for creating educational programmes that demystify AI concepts for non-technical audiences, particularly targeting groups that may feel excluded from technological advancements. Furthermore, PwC reports that addressing these ethical concerns is not just a moral imperative but also improves trust and engagement in AI technologies.¹⁸⁶

Principle 6

Enable Continuity: Establishing Continuous Learning and Support Systems through Mentorship and Networking

Looking beyond programme accessibility and content, establishing continuous learning and support systems, particularly through mentorship, networking, and community support, ensures continuous learning during and after the programme. According to the analysis, incorporating such mechanisms significantly boosts confidence and job placement rates. For example, mentorship initiatives by the **National Skill Development Corporation in India** connect learners with industry experts, helping them navigate the complexities of the tech workforce. Programmes that integrate forums or workshops, such as those facilitated by the **New Taipei City Government**, provide valuable networking opportunities where participants can engage with industry professionals and build connections that often lead to job placements. In addition, continuous support systems—such as those implemented by **Google Research** and **Endeavor Indonesia**—offer ongoing mentorship and online resources to help participants stay competitive as AI technologies evolve.

¹⁸⁶ PwC, [Building ethical AI through leadership and trust](#), 2019.

Principle 7

Leverage Collaboration: Collaborating with Local Partners, Industry Experts, and Educational Institutions

The analysis emphasised the importance of collaborating with local partners, industry experts, and educational institutions to reach the desired target populations and create impactful AI training programmes. For example, **Honeywell Hometown Solutions Foundation** partners with local communities in India, working with vocational training centres and community organisations to upskill workers from communities with unmet needs, contributing to effective outreach and trust-building within these communities. Public services like libraries and community centres are well-positioned to provide essential digital infrastructure, offering access to computers and internet services, as seen in Indonesia's efforts under East Java Governor Khofifah's leadership, which emphasises the transformation of libraries into central hubs for enhancing digital literacy. In Singapore, public-private initiatives between government agencies and companies like Microsoft help reskill professionals, particularly those displaced by automation, while supporting 2,000 SMEs through mentorship and industry-relevant training. **AWS** and the **Indian School of Business** collaboratively offer tailored AI training programmes, enhancing employability by providing hands-on experience in AI technologies and creating clear pathways for job placements. By leveraging the expertise and resources of multiple sectors, these analysed programmes equip participants with the skills and confidence needed to thrive in the rapidly evolving AI landscape.

Conclusion

This report provides an overview of the key factors shaping AI workforce development in the APAC region. It explores how AI is reshaping skill demands today, identifies the communities that would benefit most from support in transitioning to an AI-driven workforce—categorised as Essential Skilling Clusters—and examines existing skilling initiatives designed to meet emerging skilling needs. It also offers valuable insights from end-beneficiaries, highlights market-specific trends and opportunities, and presents design principles for developing effective skilling programmes. A deeper understanding of these elements enables stakeholders to harness existing opportunities, create more impactful initiatives, and adopt a more strategic and collaborative approach to navigating the AI transition.

To ensure an AI Just Transition, AI skilling efforts must be targeted, accessible, and aligned with market demands. To effectively address the workforce's diverse needs, these efforts must also consider the three critical lenses of Transformation, Adaptation, and Access. By focusing on these priorities, we can create a workforce that is not only prepared for the AI-driven future but also empowered to shape it.

Asia-Pacific is in a position to capitalise on this opportunity. As detailed in this report, it is clear that AI presents significant opportunities for economic growth and workforce transformation in the region. To unlock this potential, it is imperative that governments, social investors, and skilling delivery partners collaborate to unlock the full potential of AI and build a future that is empowering, fair, and prosperous for all.

AVPN, supported by Google.org and ADB, aims to ensure that all workers are meaningfully engaged in and can benefit from the AI Transition. The [AI Opportunity Fund: Asia-Pacific](#) is a bold step in the right direction, and we look forward to working with our member network to drive this agenda forward.



Methodology

This research takes a fivefold approach to surface insights:

Phase I: AI-Powered Data Collection and Analysis

Data were gathered from publicly available resources, including news media, academic articles, policy documents, reports, and website content. From the beginning of 2022 to July 2024, the source material comprised 350,000 news articles in seven different languages (English, Mandarin Chinese, Hindi, Malay, Indonesian, Japanese, and Korean), 60,000 academic articles, over 350 policy documents, and web content collected through more than 6,000 automated web searches.

To analyse this vast and diverse dataset, proprietary AI-powered text analytics pipelines were designed, utilising large language models and Natural Language Processing operations to filter irrelevant information, extract and structure relevant data, and cluster it bottom-up. These methods enabled the identification of patterns and efficient summarisation of critical insights within the data, leveraging AI to process and synthesise information on a massive scale.

Phase II: Beneficiary Surveys

Surveys were conducted in each target market in the local language, focusing on essential skilling clusters and their perceptions, familiarity, and challenges regarding the AI transition. The survey included multiple-choice and open-ended questions to gather structured data and capture respondents' unique perspectives. A total of 2,840 responses were collected, distributed as follows across non-exclusive categories: 51% women, 43% young adults, 18% mature workforce, 16% job seekers, 11% people with low digital literacy, and 5% racial and ethnic minorities.

Phase III: Insight Extraction Through Data Clustering

From this extensive source material, information on essential skilling clusters, skilling stakeholders and their programmes, and policy activities were identified and extracted for each focal market. The analysis revealed clear insights into the who, how, and where of these groups, providing a comprehensive overview of skilling organisations and their activities. It offered a deep understanding of the policy landscape surrounding AI and its impact on the workforce.

Phase IV: Expert Validation through Interviews and Workshops

The information and insights extracted from the automated analysis were validated and strengthened through interviews and a panel workshop with subject matter experts.

Phase V: Comprehensive Insight Synthesis

Based on the above, high-level insights were synthesised and compiled in a roadmap for providers of AI skilling.

Glossary

AI	Artificial intelligence
AI Just Transition	An AI Just Transition requires actively addressing skill gaps by providing accessible AI education and training to ensure that all workers are equipped with the necessary knowledge and tools to benefit from AI-driven opportunities.
Essential skilling clusters	This term encompasses all segments of the workforce that are likely to benefit most from skilling opportunities in AI-driven workforce transitions. These clusters are identified based on their specific needs and challenges, making them the most in need of support to adapt to AI transformation.
Mature workforce	Those in the workforce who are between 50 and 65 are considered to be mid-career or nearing retirement.
ML	Machine learning
Recent graduates	Those groups have recently finished tertiary education with minimal work experience and are now entering the workforce with higher qualifications.
Target end-beneficiaries	This includes the profile of workers who stand to benefit from essential artificial intelligence (AI) knowledge and tools as part of the AI Opportunity Fund: Asia Pacific.
Underprivileged communities	Groups who are disadvantaged due to lack of opportunities, etc., that the average person is able to access. <i>This term was identified as part of Phase 1 of the methodology, which sought to identify communities that could most benefit from an AI Just Transition.</i>
Young adult workers	Those younger groups in the workforce are within the age range of 15–29 years old.

Appendix A

Essential Skilling Clusters, Their Frequency of Mentions, and Market Representation

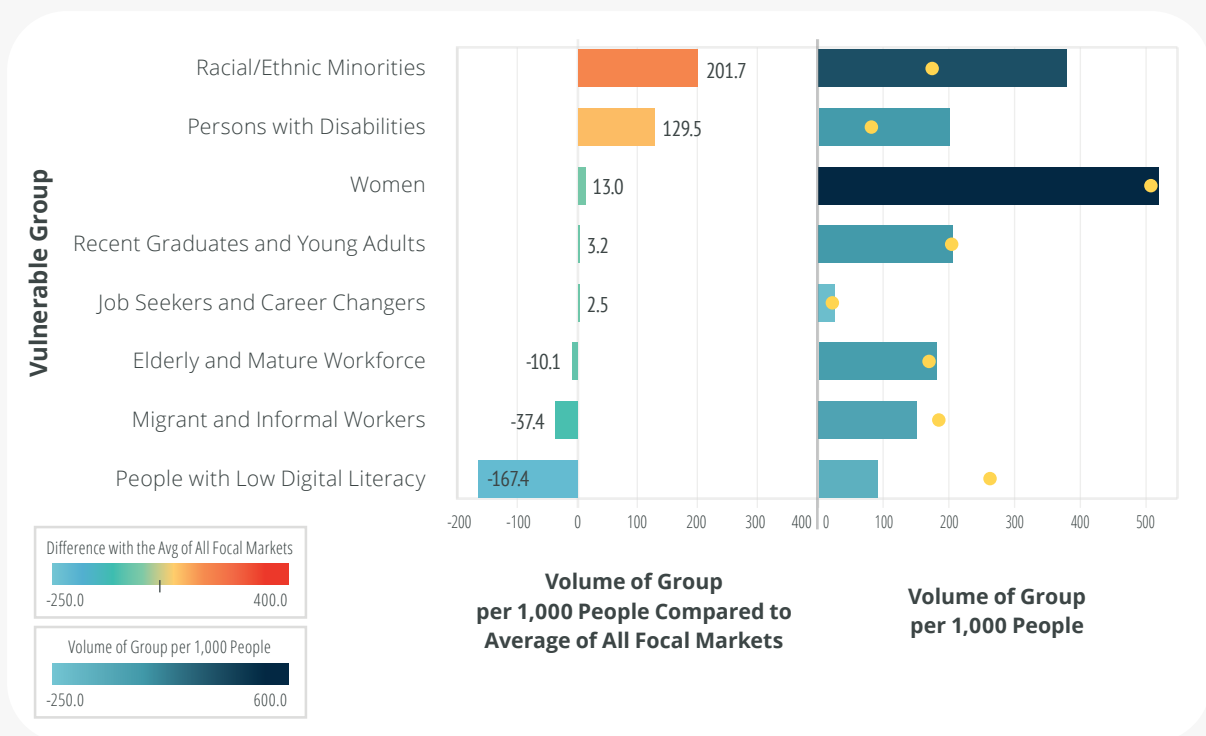
	<i>"High" if >2% of mentions; "Medium" if 1–2% of mentions; "Low" if < 1% of mentions</i>	<i>"Strong" if present among groups with highest association to a skill set; "Medium" if present but with lower association</i>	<i>Based on the comparison of projected volumes per 1,000 people in each focal market</i>	<i>Based on the online discussion about each group and market</i>
ESSENTIAL SKILLING CLUSTER	FREQUENCY OF MENTIONS AS GROUP	ALIGNMENT WITH SKILL SETS	MARKETS WHERE THE GROUP IS MOST OVERREPRESENTED	MARKETS MOST STRONGLY ASSOCIATED WITH THE GROUP IN THE SOURCE MATERIAL
Recent Graduates and Young Adults	High	Strong	India, Indonesia, Vietnam	Indonesia, Taiwan, Vietnam, India
Women	High	Medium	–	Indonesia, India, Australia
Job Seekers and Career Changers	Medium	Strong	Indonesia	Japan, Vietnam, Singapore, India, Australia
Racial/Ethnic Minorities	Medium	Medium	Australia, India, Singapore, Indonesia	Australia, Vietnam, Indonesia
People with Low Digital Literacy	Low	Strong	Indonesia, Vietnam, India	Japan, Australia, Vietnam
Migrant and Informal Workers	Low	Strong	Vietnam, India, Indonesia	Japan, Indonesia, Vietnam
Persons with Disabilities	Low	Medium	Australia, Indonesia	South Korea, Australia
Elderly and Mature Workforce	Low	Medium	South Korea, Japan	South Korea, Singapore, Japan, Taiwan, Vietnam

Appendix B

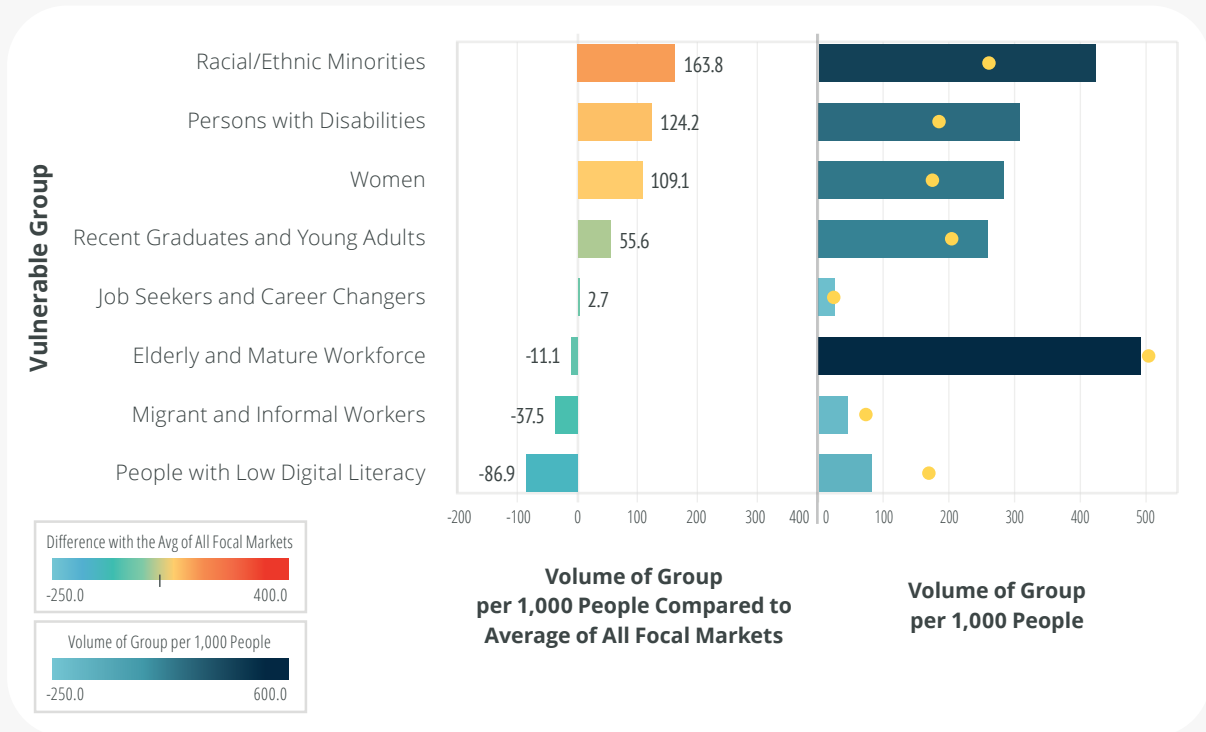
Comparison of Essential Skilling Clusters Per Country or Territory

The charts per market below compare volumes for different essential skilling clusters per focal country or territory and the absolute volumes per 1,000 people based on the projected numbers. The yellow circles on the absolute volume charts indicate the average volume for all focal countries or territories.

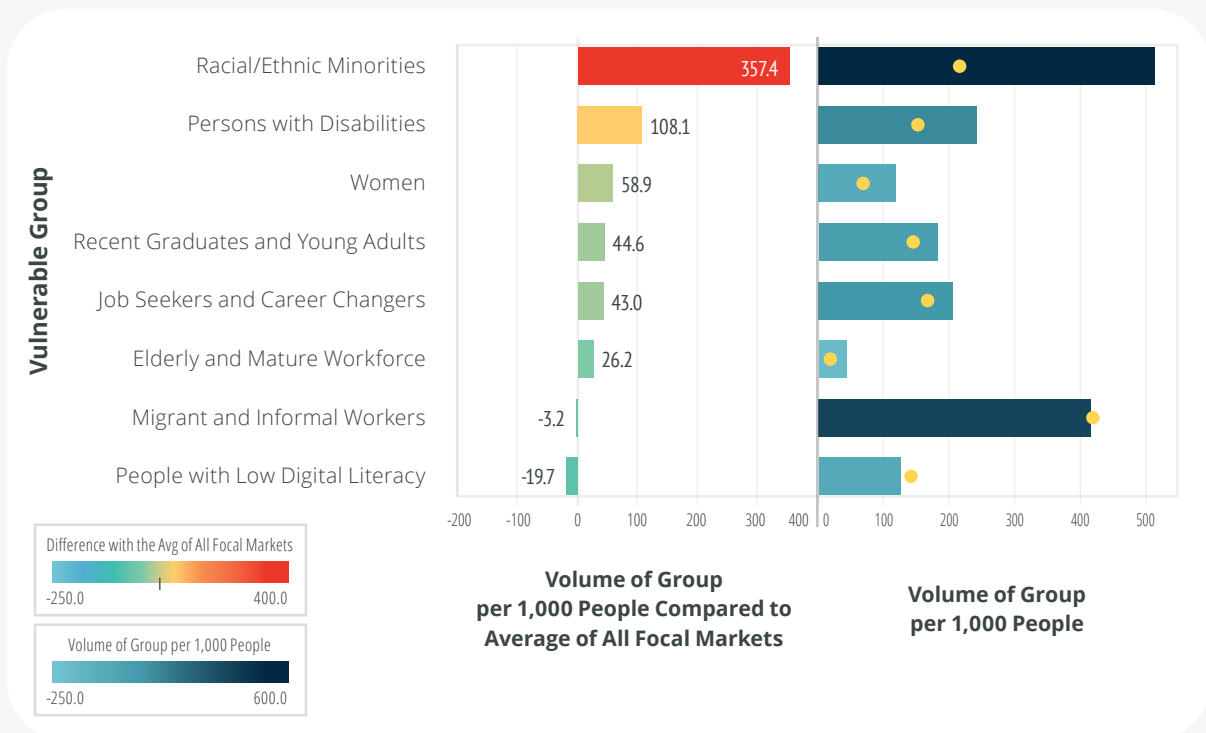
Australia



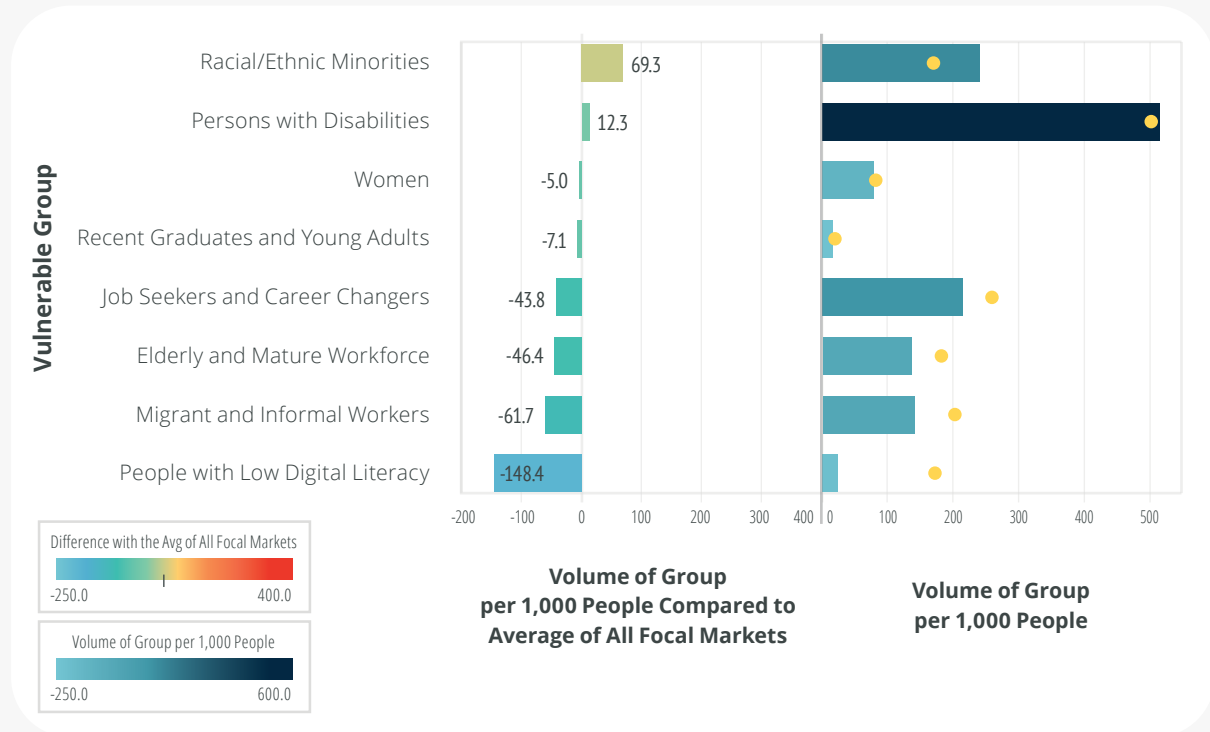
India



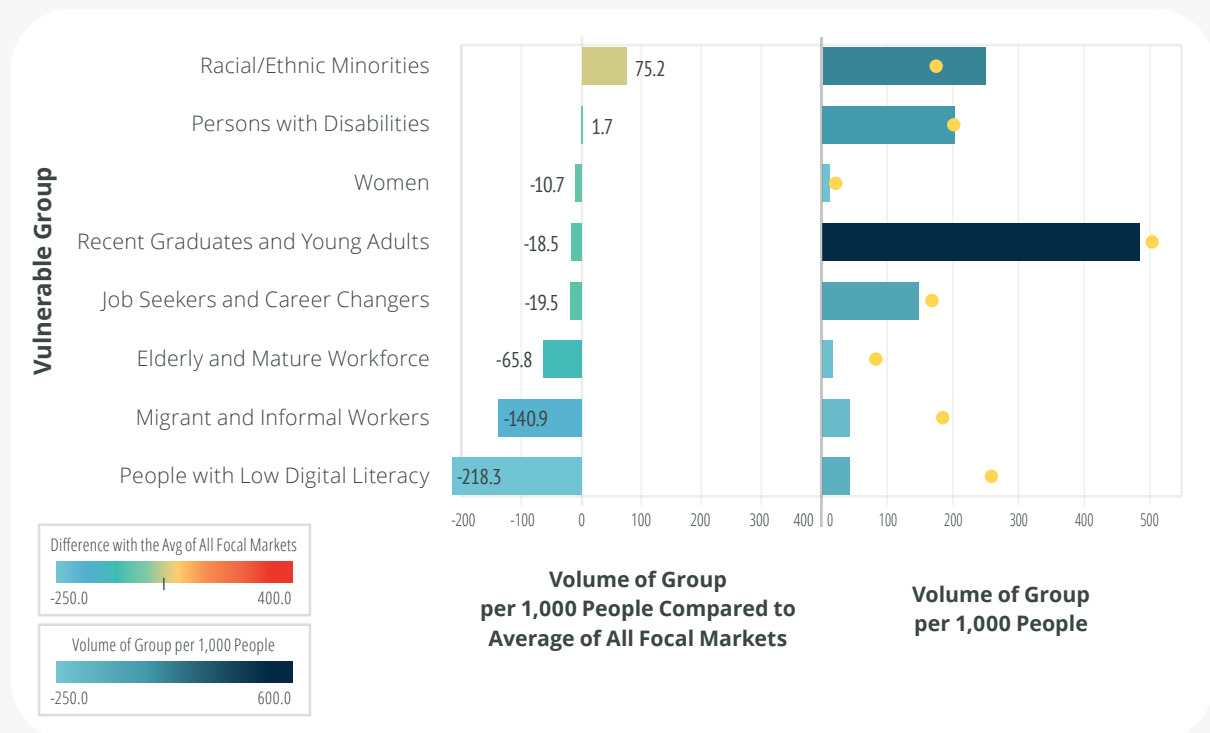
Indonesia



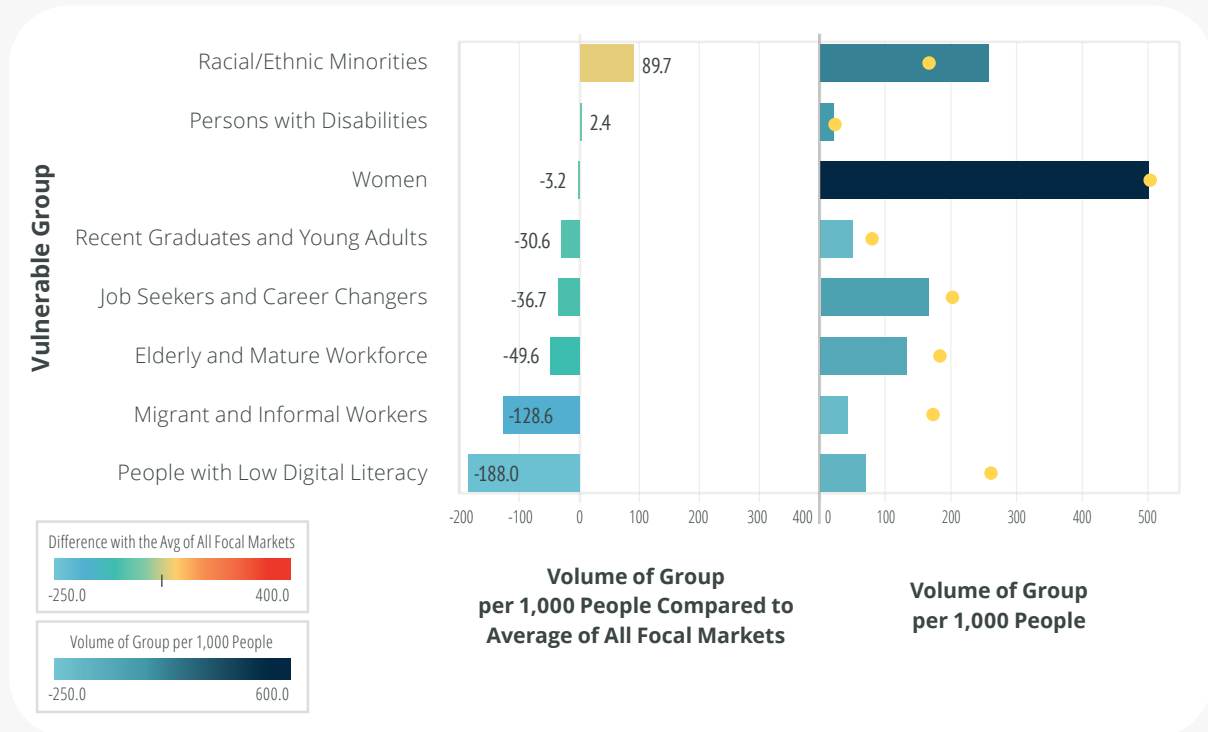
Japan



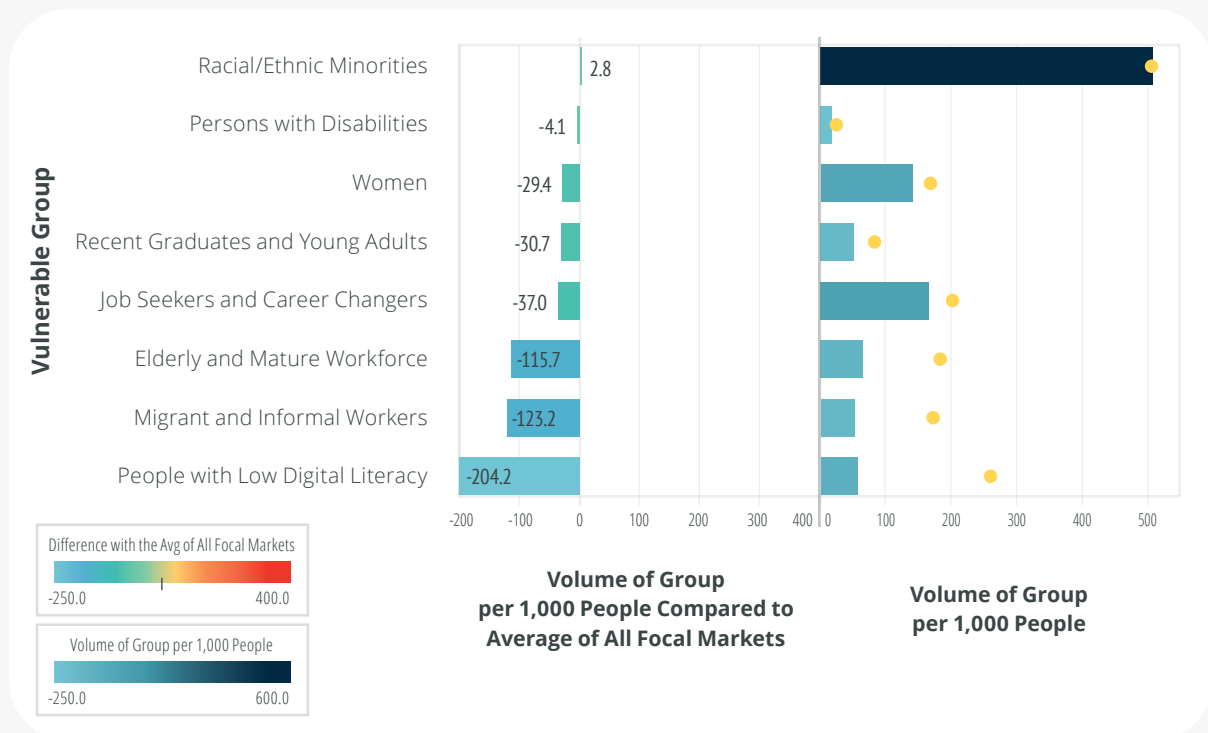
Singapore



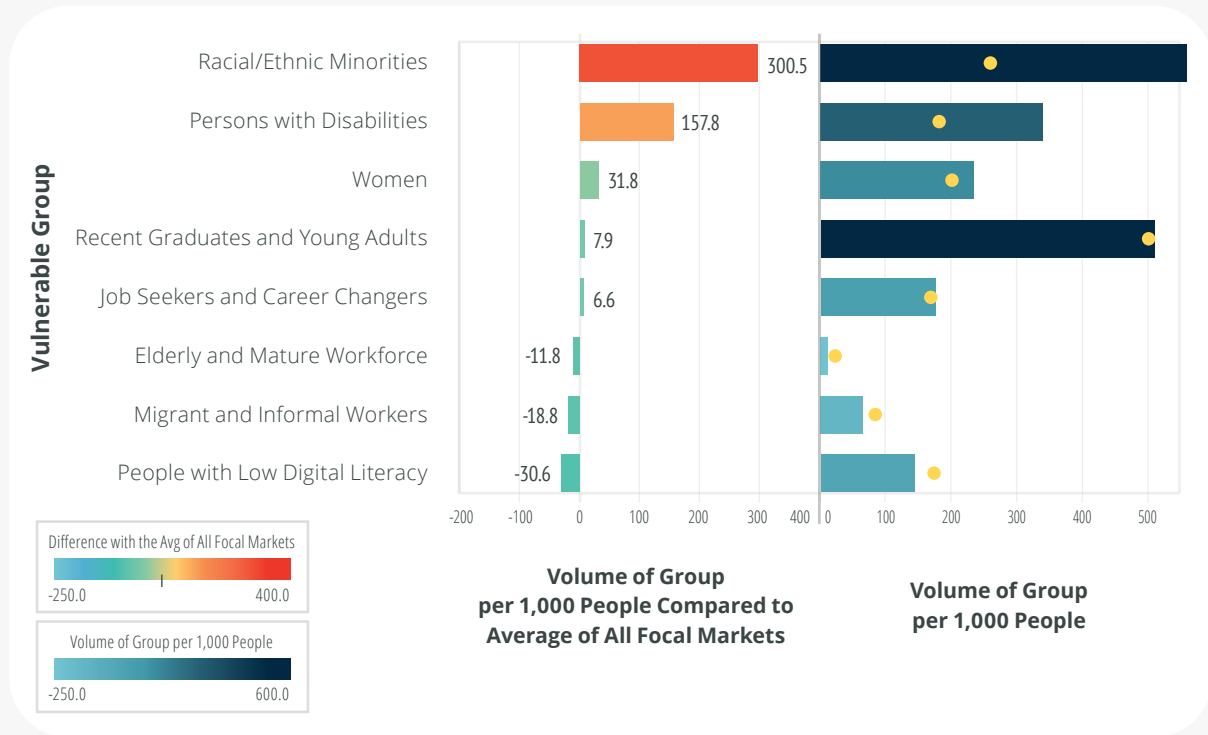
South Korea



Taiwan



Vietnam



Appendix C

A 10-Dimensional Policy Framework Across the Asia-Pacific Region

The matrix below indicates each country or territory's strengths along each of the 10 policy dimensions assessed, using scores from 1 (weak support) to 3 (strong support).

		Score			● 1			● 2			● 3		
DIMENSION	AUSTRALIA	INDIA	INDONESIA	JAPAN	SINGAPORE	SOUTH KOREA	TAIWAN	VIETNAM					
Digital Divide & Inclusion	● 3	● 3	● 3	● 2	● 3	● 2	● 3	● 2					
Educational Integration & Curriculum Development	● 2	● 2	● 2	● 3	● 3	● 3	● 3	● 1					
Funding & Investment	● 3	● 2	● 1	● 3	● 3	● 2	● 2	● 3					
Government Support & Infrastructure	● 3	● 2	● 3	● 2	● 3	● 3	● 3	● 3					
International Collaboration & Standards	● 3	● 2	● 2	● 3	● 2	● 2	● 2	● 1					
Legislative Action	● 2	● 1	● 2	● 2	● 2	● 3	● 1	● 2					
National AI Strategy & Policy Targets	● 2	● 2	● 3	● 3	● 3	● 3	● 2	● 2					
Private Sector Engagement	● 3	● 2	● 2	● 2	● 2	● 3	● 2	● 2					
Sector-Specific AI Initiatives	● 2	● 3	● 2	● 3	● 3	● 3	● 2	● 2					
Workforce Readiness & Capacity Building	● 3	● 2	● 2	● 3	● 3	● 3	● 3	● 2					



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