ARTIFICIAL INTELLIGENCE
ADOPTION POLICY POSITION PAPER 2025

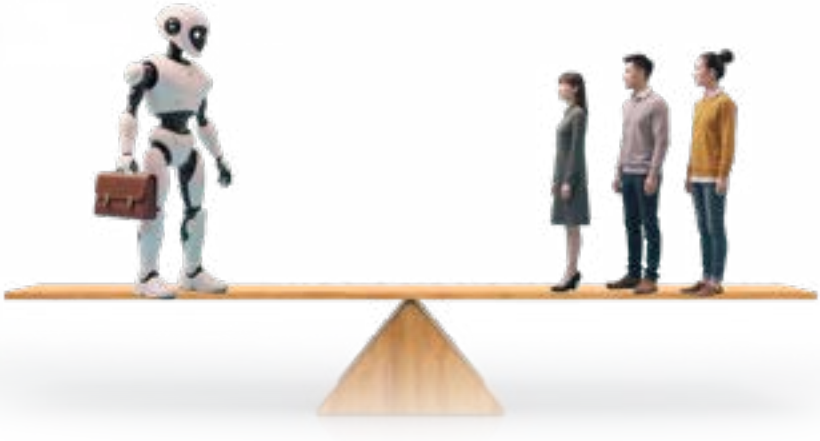
Foreword

This AI position paper was co-authored by both Young PAP and the Association of Small and Medium Enterprises' AI Action Group committee to focus on youth employment and employability in an AI-driven era through uplifting SMEs' capabilities and global competitiveness through AI adoption.

1. BACKGROUND

The democratisation of artificial intelligence (AI) technologies has profound implications for Singapore's economy. AI adoption has the potential to significantly enhance Singapore's economic productivity by automating operational processes, streamlining administration, creating marketing content, and improving predictive analysis. Businesses and individuals can harness these off-the-shelf technologies to boost efficiency and drive innovate across different sectors.

However, as a regional knowledge hub, Singapore faces disproportionate labour market disruptions from the impending AI integration. The rapid adoption of generative AI (GenAI) threatens to displace knowledge workers, creating new vulnerable groups among white-collar professionals.[1] Surveys indicate that 70% of surveyed Singaporeans recognised that GenAI's impact on their vocation, while 51% fear job displacement.[2] Yet, a more recent survey found that only 22% prioritise identified AI-related skills for reskilling. [3]



[1] Liana Tang, "AI, Technology & Singapore: Preparing for the Future", ETHOS no. 27, (Civil Service College Singapore), 2024, https://knowledge.csc.gov.sg/ai-technology-singapore-preparing-for-the-future/.

[2] Gigi Onag, "70% of SG workers say AI will impact jobs", Future CIO, 18 May 2023, https://futurecio.tech/70-of-sg-workers-say-ai-will-impact-jobs/.

[3] Vic Sithasanan, "Singapore lags reskilling for AI revolution", Futureiot, 20 November 2024, https://futureiot.tech/singapore-lags-reskilling-for-ai-revolution/.

Survey Data shows

70% recognise GenAI's impact on jobs.

51% fear displacement

Only **22%** prioritise AI reskilling

Each industrial robot replaces **1.6 jobs** in manufacturing.

78% of workers are unclear about AI's role in their careers.

While the precise scale of job displacement remains uncertain, historical parallels in the manufacturing sector offer insights. Singapore ranks as the world's second most robot-dense country, with 730 industrial robots per 10,000 employees.[4] Despite the growth in Singapore's manufacturing sector, the robotisation of the manufacturing industry continued to shrink the manufacturing labour force.[5] It is estimated that each new industrial robot replaces 1.6 manufacturing jobs.[6]

This paper proposes solutions to improve the employability of Polytechnic and ITE (PolITE) graduates amidst the AI revolution. As vocationally trained professionals, PolITE graduates are particularly vulnerable to AI-driven job displacement. Many students express uncertainty about the relevance of skills acquired from formal tertiary institutions, which manifests as a lack of confidence in the workplace. 78% of surveyed workers report that the role of AI skills in their careers remains unclear.[7]

[4] "Robot Density nearly Doubled globally", International Federation of Robotics, 14 December 2021, https://ifr.org/ifr-press-releases/news/robot-density-nearly-doubled-globally.
[5] Jon Emont, "How Singapore got its Manufacturing Mojo Back", The Wall Street Journal, 22 June 2022, https://www.wsj.com/articles/singapore-manufacturing-factory-automation-11655488002.
[6] Tappy Lung, "Artificial Intelligence and the Future of Singapore's Foreign Workforce", Center for Strategic & International Studies, 17 April, 2024, https://www.csis.org/blogs/new-perspectives-asia/artificial-intelligence-and-future-singapores-foreign-workforce.
[7] "AI skills could boost Singapore workers' salaries by more than 25% and accelerate career growth as AI adoption ramps up, finds new research", Amazon.Sg, 9 March 2024, https://press.aboutamazon.com/sg/2024/3/ai-skills-could-boost-singapore-workers-salaries-by-more-than-25-and-accelerate-career-growth-as-ai-adoption-ramps-up-finds-new-research.

This paper focuses on two key strategies: job creation and enhanced apprenticeships. First, it explores how the Singapore government can incentivise AI adoption among local Small Medium Enterprises (SMEs) to drive demand for AI literacy in the workforce. Second, it proposes a framework to strengthen apprenticeship programs, improving tacit skills transfer and enhancing the internship experience for PolITE students to improve their employability. And thirdly, it also sets out to support the creation of the "Fit-for-Purpose" Digital solutions powered by AI specifically for SME Business Owners.

2. GOVERNMENT EFFORTS

The Singapore government has made significant strides to foster AI adoption, implementing a range of initiatives to support businesses in AI training, technology deployment, and workforce upskilling, particularly for SMEs navigating the digital transition. These efforts are aligned with the Singapore National AI Strategy 2.0, published in December 2023.[8] Central to the AI strategy are the three systems, namely, Activity Drivers, People & Communities, Infrastructure & Environment. The illustration of the three systems is as shown below.

Singapore is preparing for AI's impact, but is it enough?

National AI Strategy 2.0 – building AI-ready infrastructure and talent.

Upskilling grants and wage subsidies – helping SMEs hire AI-skilled talent.

AI Readiness Index and CTO-as-a-Service – supporting SMEs in AI adoption.

Figure 1: Illustration retrieved from the Singapore National AI Strategy 2.0 [9]

HOWEVER, though training and support are available, adoption remains slow.

This paper recognises the government's efforts in promoting AI adoption nationally and will elaborate on two enablers that is most relevant to enhance the employability of PolITE graduates.

[8] "Singapore National AI Strategy 2.0: AI for the Public Good, for Singapore and the World", (Singapore Ministry of Communications and Information, 4 December 2023).
[9] Ibid 15.

Employment and Training Support

The Singapore government has actively promoted AI-related hiring and workforce integration by investing in upskilling initiatives and financial incentives to support companies in attracting and retaining AI talent. Programs such as training subsidies, company-led upskilling grants, and AI-focused educational pathways equip workers with industry-relevant AI competencies, ensuring they remain adaptable in an evolving job market. Additionally, financial support mechanisms, such as wage subsidies and innovation grants, help businesses–especially SMEs–offset the costs of hiring AI-skilled professionals, reducing barriers to AI talent acquisition. These efforts aim to bridge the AI skills gap, foster a future-ready workforce, and ensure Singapore remains a competitive hub for AI-driven innovation.

Technical Assistance

The Singapore government provides structured technical guidance and support to facilitate AI integration within SMEs, facilitating SMEs to harness AI-driven efficiencies. One such initiative is the AI Readiness Index (AIRI), developed by AI Singapore (AISG), which serves as a self-assessment tool for SMEs to evaluate their AI readiness. AIRI aims to empower businesses to make informed decisions about their AI strategies. Additionally, the SMEs Go Digital Program helps businesses implement AI-enabled solutions by providing access to pre-approved digital tools. This initiative also offers sector-specific AI strategies through Industry Digital Plans (IDPs), which are tailored to meet the unique technological needs of different industries. The Chief Technology Officer-as-a-Service (CTOaaS) program also helps SMEs receive expert consultation and customised recommendations on AI adoption and digital transformation strategies, ensuring they can navigate AI integration effectively. These programs are efforts from the Singapore government to lower the barriers to AI adoption.

3. SME AI ADOPTION

Despite efforts to facilitate the adoption of AI among SMEs, AI-related jobs are concentrated at multinational technological corporations, while AI adoption among SMEs remained low. Policies proposed in this paper aims to ease the adoption of AI solutions in local SMEs further to increase the demand for entry-level AI relevant jobs. Nevertheless, SMEs face significant barriers in integrating AI into their business processes. These challenges include the ambiguity of AI solutions, high financial and opportunity cost of implementing AI solutions, and uncertain AI regulatory frameworks. Overcoming these hurdles are essential to enabling SMEs to harness AI-driven productivity gains while creating more accessible pathways for entry-level AI-relevant employment.

SMEs want AI but face roadblocks.

Lack of AI expertise
– Big Tech dominates AI, leaving SMEs behind.

High costs – AI infrastructure and training require big investments.

Unclear regulations
– SMEs fear data risks and compliance uncertainty.

Without support, SMEs struggle to compete in an AI-driven economy.

Ambiguity of AI Solutions

Competence and knowledge on AI are concentrated in Big Tech Multinational Corporations (MNCs). With the exception of tech-centric start-ups, most SME lack the technical know-how to understand AI, putting SMEs in a disadvantageous position as compared to Tech MNCs.[10] This deficiency in technical knowledge may lead to the inadequate adoption of AI, not tailored to the SME's needs and niches. Additionally, the lack of competence in data-driven management may deter SMEs from adopting AI solutions.

Financial and Opportunity Cost

Implementing AI solutions entails a substantial perceived upfront expense, including technological infrastructure, software, and training.[11] SMEs often depend on government grants to mitigate these financial burdens. However, the current government grant schemes require SMEs to bear the initial cost before they are reimbursed, demanding significant capital reserves from SMEs. This liquidity constraint discourages AI adoption as many SME struggle with cashflow and may be deterred from the upfront investment despite the availability of government support.

Uncertain Regulatory Framework

The uncertainty of AI regulations deters SMEs due to concerns over data security, accountability, and trust. SMEs fear proprietary data misuse when AI-generated content is trained on their data, risking loss of competitive advantage. AI adoption also requires constant cybersecurity upgrades to protect confidential information from cyber threats, which many SMEs find costly. Furthermore, AI adoption demands robust IT infrastructure and information security protocols, yet compliance requirements remain vague. Without clear regulations addressing data protection, system integrity, and liability, SMEs hesitate to invest in AI, fearing legal, financial, and ethical risks that could undermine their business.

4. EMPLOYABILITY OF POLITE GRADUATES

Polytechnic and ITE (PolITE) graduates are most vulnerable to job displacement in the AI-driven economy. While they possess vocational skills, many lack practical AI literacy essential for staying competitive. Classroom learning alone is insufficient–hands-on experience through internships is crucial for building AI-relevant skills. However, internship opportunities for PolITE students in AI-related roles remain scarce in Singapore, limiting students' exposure to real-world applications. SMEs, even if they adopt AI solutions, often struggle to transfer AI knowledge effectively due to resource constraints and a lack of structured mentorship. Without industry engagement, PolITE graduates risk falling behind in an evolving job market.

Admittedly, there are efforts to improve engagement between industry and PolITE students. For example, AI Spring for Workforce an initiative by Amazon Web Services (AWS) to provide up-to-date curriculum for Pre-Employment Training (PET) and Continuing Employment Training (CET) at tertiary institutions, including Polytechnics and ITEs.[12] Polytechnics have also developed curriculum for specialisations in generative AI to future-proof their students.[13] Other projects involving tertiary institutions and industry include Temasek Polytechnic FutureX programme.[14]

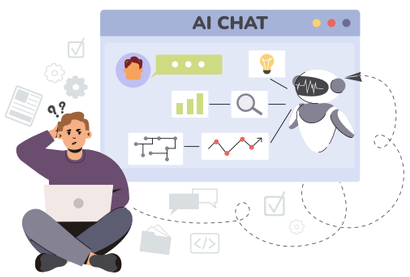
[10] Axel Aarstad and Michal Saidl, "Barriers to Adopting AI Technology in SMEs: A Multiple-Case Study on Perceived Barriers Discouraging Nordic Small and Medium-sized Enterprises to Adopt Artificial Intelligence-Based Solutions", Master's Thesis, (Copenhagen Business School, September 2019), https://research-api.cbs.dk/ws/portalfiles/portal/60704162/790410_Aarstad_Saidl_Barriers_to_Adopting_AI_Technology_in_SMEs.pdf.
[11] Ibid 16.
[12] "AWS deepens commitment to Singapore with additional S$12 billion investment by 2028 and new flagship AI programme", Amazon Web Services, 9 May 2024, https://www.aboutamazon.sg/news/aws/aws-deepens-commitment-to-singapore-with-additional-sg-12-billion-investment-by-2028-and-new-flagship-ai-programme.
[13] Ang Yiying, Manuelle Chia and Tan Wei Xuan, "What went on at polytechnic open houses and what's new", The Straits Times, 8 January 2024, https://www.straitstimes.com/singapore/what-went-on-at-polytechnic-open-houses-and-what-s-new.
[14] "FutureX centre at Temasek Polytechnic set to advance efforts in digital innovation and capability development", Temasek Polytechnic, 15 October 2024, https://www.tp.edu.sg/about-tp/media-centre/press-release/Future-centre-at-Temasek-Polytechnic-set-to-advance-efforts-in-digital-innovation-and--capability-development.html.

On top of isolated initiatives by tertiary institutions, policies should focus on expanding AI-focused internships and equipping SMEs with knowledge-sharing capabilities. Strengthening collaboration between educational institutions, SMEs, and industry leaders will help bridge the gap between classroom learning and AI-driven workplace demands, enhancing PolITE graduates' employability.

PolITE graduates risk being left behind in AI's rise.

High risk of job displacement due to limited AI literacy.

Classroom learning does not fully translate to AI workplace skills.



Expanding AI internships and SME collaboration is key for their future.

5. POLICY PROPOSALS

Proposal 1: One-Stop AI Consultancy Centre

The One-Stop AI Consultancy Centre creates a platform for subject matter experts to contribute their expertise in AI regulation and assess the viability of AI-related grants. By assigning business and trade associations to operate the One-Stop AI Consultancy Centre, the Singapore government can capitalise on the industrial knowledge to execute Singapore's AI regulation and assess AI-related grants more effectively. Thereby allowing SMEs interested in implementing AI solutions to get the support they require.

Additionally, this One-Stop AI Consultancy Centre can also serve as an innovation incubator with shared infrastructure and facilities. Through these shared facilities, the One-Stop AI Consultancy Centre can serve as a venue for networking to provide AI intrapreneurship programmes and unlock networks for students aspiring to apply off-the-shelf AI products to SMEs.

Proposal 2: Apprenticeship Guideline

PolITE students are encouraged to take up internship roles to benefit from on-the-job training (OJT). Central to the concept of OJT is the transfer of tacit knowledge from the organisation to the employee. However, SMEs suffer from resource strain and may not have the capacity to develop guidelines to engage interns even if they intend to groom and develop the PolITE interns. Therefore, the Singapore government should develop a non-enforceable Apprenticeship Guideline to provide SMEs with a framework to transfer tacit knowledge.

Proposal 3 : Creation of the "Fit-for-Purpose" Digital Solutions Powered by AI specifically for Micro and Smaller Business Owners

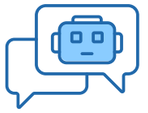
The overall intent of this recommendation is to uplift our SME's by making market access to higher-end AI tech products more accessible and possible. These solutions should focus on 4 key focus areas of AI & Digitisation.

They should encompass:

Digital marketing

Data & Sentiment Analytics

Creation of Digital Influencers



Chatbot formation as a starting point.

The intent is for these customized digital solutions to be built and serviced by SME business owners who are better able to understand the challenges of fellow Singapore small business owners who are facing struggles to manage and scale their businesses.

Proposal 4: Creation of "Super Users" of AI systems by our youths from ITE's and Polytechnics

Many local SME businesses face staff challenges in both internal capability and willingness to change for digitalization. It is the intent to provide incentives and support to train Student Digital Champions that combine hard/technical skills training, and the right ability to operate digital tools, with good data interpretation and presentation skills to drive and meet business objectives for our SME's.

This ensures a win-win for both the students and the SME Business Owners. We should support the recent MOU's with our local Polytechnics and ITE's during the AI Festival Asia 2025 to encourage training of such students and then allowing students to be matched and tagged to the different SME's as interns first, and then to build staff who would better manage and operate such AI systems as a "Super User" not only able to operate such Tech, but also able to better glean business insights and present them competently to Senior Management of such SME's.

Proposal 5: AI Integration with Industry Transformation Map

The Industry Transformation Map (ITM) was launched in 2016 as part of Singapore's Committee on Future Economy's strategy to drive industry-specific productivity growth.[15] While recommendations to transform each of the 23 identified industries have concluded in 2023, the emergence of AI has not been a factor in the development of these ITMs. Therefore, it might be useful to review and consider the impact of AI in all 23 ITMs.

[15] "Future Economy Council (FEC) – 2017 to 2023", Singapore Ministry of Trade and Industry, n.d., https://www.mti.gov.sg/FutureEconomy/Overview.

FIVE KEY PROPOSALS TO FUTURE-PROOF SINGAPORE'S WORKFORCE.

01 **One-Stop AI Consultancy** – expert support for SMEs on AI grants and adoption.

02 **Apprenticeship Guidelines** – structured AI training for PolITE interns.

03 **Fit-for-Purpose AI Solutions** – affordable AI tools for micro and small businesses.

04 **Super Users Initiative** – training students as AI specialists for SMEs.

05 **AI in Industry Transformation Maps** – integrating AI into all 23 key sectors.

AI will drive a new era of competitiveness. Singaporeans and Singapore SMEs cannot afford to fall behind.

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