

MALAYSIA

Advancing with AI at the fore

Nurfadhlina Mohd Sharef

Chairperson of the Young Scientist Network at the Academy of Sciences Malaysia; Professor at the Faculty of Computer Science and Information Technology, Universiti Putra Malaysia



Key takeaways:

- Malaysia aims to become a high-tech nation by 2030 through the strategic integration of AI, as set out in key policies including the National Science, Technology and Innovation Policy 2030–2021 and the National Artificial Intelligence Roadmap –2021–2025. These policies promote the adoption of AI in sectors like health care, education, agriculture and finance, to boost economic development and societal well-being.
- Major global technology companies like Oracle, Google, Microsoft, NVIDIA and Amazon Web Services have invested billions of dollars in Malaysia to enhance AI and cloud computing infrastructure, underscoring Malaysia’s role in the global AI landscape.
- A National AI Office, newly established in 2024, aims to position Malaysia as a key AI player in the Association of Southeast Asian Nations (ASEAN) and globally, and demonstrates Malaysia’s commitment to AI innovation.

As Malaysia strides boldly into the Fourth Industrial Revolution (4IR), the convergence of science, technology and innovation becomes paramount for sustainable growth. At the heart of this transformation lies the strategic integration of AI, propelling Malaysia towards its vision of becoming a high-tech nation by 2030. Guided by pivotal policy frameworks, Malaysia’s journey unfolds as a testament to the nation’s commitment to leveraging AI for scientific advancement and economic prosperity.

Enabling policies

In 2021, the Government of Malaysia introduced its *National Science, Technology and Innovation Policy 2021–2030* (MoSTI, 2020) to intensify the development of local technology. As part of this initiative, the Academy of Sciences Malaysia (ASM) developed the *Malaysian Science, Technology, Innovation and Economy (10-10 MySTIE) Framework* (ASM, 2020), specifically to boost economic development and enhance levels of innovation, wealth generation, inclusion and well-being in society.

At the same time, the Economic Planning Unit of the Prime Minister’s Department developed a *National Fourth Industrial Revolution Policy* (EPU, 2021a) to serve as a comprehensive national strategy for the 4IR. Aligned with the *National Science, Technology and Innovation Policy 2021–2030*, it provides guiding principles and strategic direction to ministries and

agencies, aiming to optimize resource allocation and manage emerging risks. The policy supports national development policies such as the *Twelfth Malaysia Plan and Shared Prosperity Vision 2030*, and complements the *Malaysia Digital Economy Blueprint* (EPU, 2021b) in driving the growth of the digital economy and bridging the digital gap.

In line with these policies, Malaysia's *National AI Roadmap 2021–2025* (MoSTI, 2021) aims to kickstart a thriving AI innovation ecosystem in Malaysia, and encourage industry leaders and academicians to develop and implement AI solutions. To coordinate and monitor implementation of this roadmap, the Ministry of Science, Technology and Innovation (MoSTI) established a National Blockchain and Artificial Intelligence Committee (Ministry of Communications, 2022). This committee aims to accelerate the adoption of AI adoption, using the roadmap to identify national cases of AI use in supply chains, health care, education, agriculture and finance.

Malaysia's national roadmap also recommends embarking on fundamental and applied research and development (R&D) in relevant entities within the AI innovation ecosystem, and encouraging AI adoption for all fields of R&D. Accordingly, each state in Malaysia has a digital transformation strategy, with Selangor, Sarawak, Terengganu, Penang and Melaka showing robust adoption of AI, through for example increasing digital labour and growing awareness of R&D.

To support this work, and provide national AI standards, Malaysia's Department of Standards formed an AI technical committee with representatives from various sectors (DSM, 2023). Malaysia is also actively participating in the development of International Organization for Standardization (ISO) AI standards (ISO/IEC42000).

Government of Malaysia principles for AI

In line with national and ISO standards, and aligning with principles established by organizations including the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Organisation for Economic Co-operation and Development, and the European Commission, the Government of Malaysian government has proposed seven principles for the development of trusted and responsible AI. These principles relate to:

- fairness
- reliability
- safety and control
- privacy and security
- inclusiveness
- transparency
- accountability
- pursuit of human benefit and happiness

New ministry, AI office and guidelines

To further strengthen the AI agenda, Malaysia established in 2024 a new Ministry of Digital. Under this ministry, the country approved a National AI Office, with the aim of positioning Malaysia as a key player in AI within ASEAN and the global landscape. This office focuses

on enhancing AI capabilities, promoting cross-sector collaboration, and supporting the integration of AI into various framework. It will spearhead initiatives that leverage AI to strengthen the digital economy, improve public services and contribute to sustainable development goals.

In September 2024, MoSTI released *National Guidelines on AI Governance and Ethics* (MoSTI, 2024), so that policy-makers and practitioners can develop and deploy AI in a safe, trustworthy and ethical manner. The guidelines provide consumer protection principles in AI, and ‘Dos and don’ts’ for adopting AI technology. According to the guidelines, key factors in effective AI governance are: awareness on AI and ethics; a centre for sustainability and AI ethics; institutional support and regulations; ownership and data sharing; buy-in from stakeholders; funding and infrastructure; and champions consisting of certified and trained professionals and a skilled workforce.

Malaysia has not enacted specific legislations on the governance of AI. However, the new national guidelines have emphasized that AI must be adopted in a way that promotes accountability and transparency, protects data privacy and security, mitigates risks, and builds public trust in parallel with Malaysia’s existing laws.

Research budgets

The 2025 budget unveiled by the Malaysian Prime Minister expands funding for AI initiatives at research universities to MYR 50 million (more than USD 11 million) – up from MYR 20 million (around USD 4.5 million) in 2024. This represents a significant leap forward for AI education and research, and demonstrates the government’s commitment to positioning Malaysia as a leader in AI innovation.

Each university is tasked with a unique focus area for AI research, aligned with national priorities. Universiti Malaya will focus on AI applications in medicine, specifically targeting the fight against cancer and other deadly diseases. Universiti Putra Malaysia, in collaboration with the National Cyber Security Agency, will establish a Malaysian cryptology technology and management centre, advancing quantum computing AI to strengthen cybersecurity against emerging threats.

Meanwhile, Universiti Sains Malaysia will align its AI research with the nation’s growing role as a global hub for semiconductors, working closely with industry leaders like Intel and Infineon. And Universiti Kebangsaan Malaysia will take on the challenge of AI-driven translation to elevate the status of the Malay language in scientific research and communication.

The budget also strengthens R&D efforts within government, increasing funding to MYR 600 million (nearly USD 135 million) for the Ministry of Higher Education and the Ministry of Science, Technology and Innovation. Additionally, the Malaysia Science Endowment will provide MYR 170 million (more than USD 38 million) in matching grants to encourage private sector investment in R&D. And to cultivate local talent and foster youth expertise in robotics and AI, the Malaysia Techlympics programme will receive MYR 10 million (around USD 2.25 million).

The 2025 budget allocates an additional MYR 20 million (around USD 4.5 million) to Universiti Teknologi Mara – to increase the number of Bumiputera engineers in the high-growth electronics and electrical sector, crucial for Malaysia’s semiconductor industry. The budget also provides for the digital transformation of public institutions. Most notably, the Malaysian Communication and Multimedia Commission will receive MYR 120 million (nearly USD 27 million) to enhance internet connectivity across public higher education institutions and RM100 million is dedicated for the Fixed Line Broadband Infrastructure Connectivity Programme for rural schools supporting the growing need for digital infrastructure in education and beyond.

To further drive innovation in education, the Government of Malaysia will offer tax breaks to private universities that develop new programmes in digital technology, including AI, robotics, the ‘internet of things’, data science and financial technology. These initiatives are expected to create high-income jobs, attract students, and position Malaysia at the forefront of digital transformation.

Research streams

To facilitate the provision of end-to-end online services, the Malaysian Government Central Data Exchange provides data integration services across agencies. This platform is led by the National Digital Department under the Ministry of Digital. Services are also informed by a main database platform developed by the Ministry of Economy in 2024 to centralize socio-economic data for targeted subsidies, enhanced data security and consolidated management. In addition, the Malaysia Open Science Platform championed by ASM is a national research asset facilitating open science and data sharing.

Alongside the provision of open data, the Malaysia AI Consortium plays a crucial role in fostering collaboration, promoting AI research and development, and driving the commercialization of AI technologies. It also supports talent development and contributes to the creation of frameworks for AI governance.

MoSTI is another ministry supporting AI transformation for academic development and research. One of its flagship programmes focuses on digitalization and the internet of things, with a pilot project at the Pasoh Reserve Forest spearheaded by ASM. This project introduces robots, systems for managing the internet of things, AI- and machine learning-based systems for species digitalization, profiling and analysis, and an ecology simulator for facilitating AI-infused forest management (ASM, 2023).

MoSTI’s National Technology and Innovation Sandbox is also driving the development of AI, providing support and financial assistance amounting to MYR 115 million (nearly USD 26 million) to 202 projects since 2020. Nearly a fifth of the projects supported were in agriculture and forestry, which benefits from AI in areas such as analytical data and image processing to determine quality classifications for fruit and vegetables.

The agricultural sector also benefits from a *Smart Agriculture Directory* developed by the Ministry of Agriculture and Food Safety as an online resource pioneering technological solutions developed through public–private partnerships; for example, a hydroponic

controller which integrates AI, the internet of things and cloud technology to manage, monitor and control pH, electrical conductivity, water temperature and humidity through a mobile phone.

Education and services

Academic research into AI is supported by the Ministry of Higher Education and the Malaysia Qualifications Agency, which release advisory notes and guidelines on the responsible use of generative AI. Higher education institutions provide additional support, through 'smart campus' and other digital initiatives. Institutions including Universiti Putra Malaysia, Universiti Teknologi Malaysia and Universiti Malaysia Pahang Al-Sultan Abdullah have developed guidelines for teachers, students and postgraduate researchers, while others such as Sunway University are drafting guiding principles for the integration of AI.

These institutional and national initiatives combined have led to a significant shift in demand, readiness and motivation among participants. Compared to earlier university cohorts, tutors and lecturers in 2024 demonstrate higher enthusiasm for AI and clearer goals, driven largely by the growing global influence of AI and data science. As these educators become more familiar with generative AI, they also develop new prompting skills, enabling them to unlock the full potential of the new tools.

A key educational development of 2024 is the Faculty of Artificial Intelligence at Universiti Teknologi Malaysia, funded by the Government of Malaysia as the first university faculty dedicated solely to AI. Launched in May 2024, this leading centre offers undergraduate, Master's and PhD programmes, focusing on cutting-edge research, practical learning and industry collaborations to prepare students for successful AI careers. It aims to position Malaysia as a leader in AI within ASEAN and globally, contributing to the country's robust AI research ecosystem. Other educational developments include the new Malaysia Centre 4IR, established by the Ministry of Economy under the MyDIGITAL initiative, and the 'AI untuk Rakyat' (AI for People) programme (MyDIGITAL, 2024).

To guide all educational endeavours relating to AI in Malaysia, ASM has prepared a white paper entitled *A New Horizon for Science, Technology and Innovation* (UPM, 2023), which contains recommendations to the Ministry of Higher Education on how to manage technological disruptions in teaching and learning and the governance of higher education. This paper is in line with the *Malaysia Higher Education Blueprint 2015–2025* (JPT, 2013) and the new blueprint which will be released soon, which promotes accessible online learning while tailoring experiences to each student's needs.

Across Malaysia and online, various conferences, talks, hackathons, forums, exhibitions and digital channels have been identifying educational opportunities for AI, addressing challenges such as talent gaps, and communicating best practice for implementation. The AI for Citizen by MyDigital in collaboration with Intel, and the MCMC Microsoft AI TEACH Programme aims to enhance AI skills and awareness among the public, ensuring that underserved groups, including the B40 community, Persons with Disabilities (PWD), women, and the unemployed be trained with AI tool proficiency. One example for the public workforce AI readiness is a symposium held by the National Institute of Public Administration (INTAN)

in October 2024. INTAN has also taken the lead on talent development in the government workforce, offering several AI-related courses for example in the area of precision agriculture, digital and e-commerce using Microsoft Azure.

Investment and the future

Recently, Malaysia has attracted significant AI investments from major global companies. Oracle has committed over USD 6.5 billion to enhance AI and cloud computing infrastructure in the country. Google is investing USD 3 billion to boost AI capabilities and establish new data centres in Malaysia and Thailand. Additionally, Microsoft is channelling USD 2.2 billion into advancing cloud and AI infrastructure, creating AI skilling opportunities, and setting up a national AI centre of excellence in Malaysia.

Nvidia and Amazon Web Services have also made significant AI investments. Nvidia has partnered with YTL Power International, committing USD 4.3 billion (MYR 20 billion) to build an AI data centre in Johor, which will use advanced AI chips to power supercomputers. And Amazon Web Services announced a USD 6.2 billion investment to expand its cloud infrastructure and AI capabilities. These substantial investments underscore Malaysia's growing role as a key player in the global AI landscape.

In conclusion, Malaysia stands at the forefront of a paradigm shift in scientific inquiry, driven by the strategic deployment of AI across various sectors. Through the concerted efforts outlined in its comprehensive policy frameworks, Malaysia has laid a robust foundation for fostering AI innovation, talent development and responsible governance. As the nation continues to chart its course towards the 4IR, Malaysia is poised to harness the full potential of AI for the betterment of its people and the advancement of science on a global scale.

References

- ASM. 2020. *10-10 Malaysian Science, Technology, Innovation and Economy (MySTIE) Framework*. Kuala Lumpur, Academy of Sciences Malaysia. <https://www.akademisains.gov.my/10-10-mystie/>.
- ASM. 2023 'Precision Biodiversity Task Force organises IoT Training Program 2023'. *ASM Focus*, 15 October. Kuala Lumpur, Academy of Sciences Malaysia. <https://www.akademisains.gov.my/asm-focus/precision-biodiversity-task-force-organises-iot-training-program-2023/>.
- DSM. 2023. *National Standards Committee on Information Technology, Communication and Multimedia (NSC 07)*. Putrajaya, Department of Standards Malaysia. <https://www.jsm.gov.my/standards/standards-development-committee/sectoral/electrotechnical-ict-and-construction>.
- EPU. 2021a. *National Fourth Industrial Revolution (4IR) Policy*. Putrajaya, Economic Planning Unit, Prime Minister's Department. <https://www.ekonomi.gov.my/sites/default/files/2021-07/National-4IR-Policy.pdf>.
- EPU. 2021b. *Malaysia Digital Economy Blueprint*. Putrajaya, Economic Planning Unit, Prime Minister's Department. <https://www.ekonomi.gov.my/sites/default/files/2021-02/malaysia-digital-economy-blueprint.pdf>.

JPT. 2013. *Malaysia Education Blueprint 2015–2025 (Higher Education)*. Putrajaya, Department Of Higher Education, Ministry Of Higher Education. <https://jpt.mohe.gov.my/portal/index.php/en/corporate/policy-documents/16-malaysia-education-development-plan-2015-2025>.

Ministry of Communications. 2022. 'Animation experts to enhance use of AI in creative industry'. *News*, 4 December. Putrajaya, Ministry of Communications. <https://www.kkd.gov.my/en/public/news/25108-animation-experts-to-enhance-use-of-ai-in-creative-industry>.

MoSTI. 2020. *National Science, Technology and Innovation Policy 2021–2030*. Putrajaya, Ministry of Science, Technology and Innovation. <https://www.mosti.gov.my/wp-content/uploads/2022/03/National-Science-Technology-and-Innovation-Policy-2021-2030.pdf>.

MoSTI. 2021. *Malaysia National Artificial Intelligence Roadmap 2023-2025*. Ministry of Science, Technology and Innovation. <https://airmap.my/wp-content/uploads/2022/08/AIR-Map-Playbook-final-s.pdf>

MoSTI. 2024. *The National Guidelines on AI Governance and Ethics*. Putrajaya, Ministry of Science, Technology and Innovation. <https://mastic.mosti.gov.my/publication/the-national-guidelines-on-ai-governance-ethics/>

MyDIGITAL. 2024. *AI untuk Rakyat [AI for People]*. Putrajaya, MyDIGITAL. <https://www.mydigital.gov.my/ai-untuk-rakyat/>.