MALAYSIA

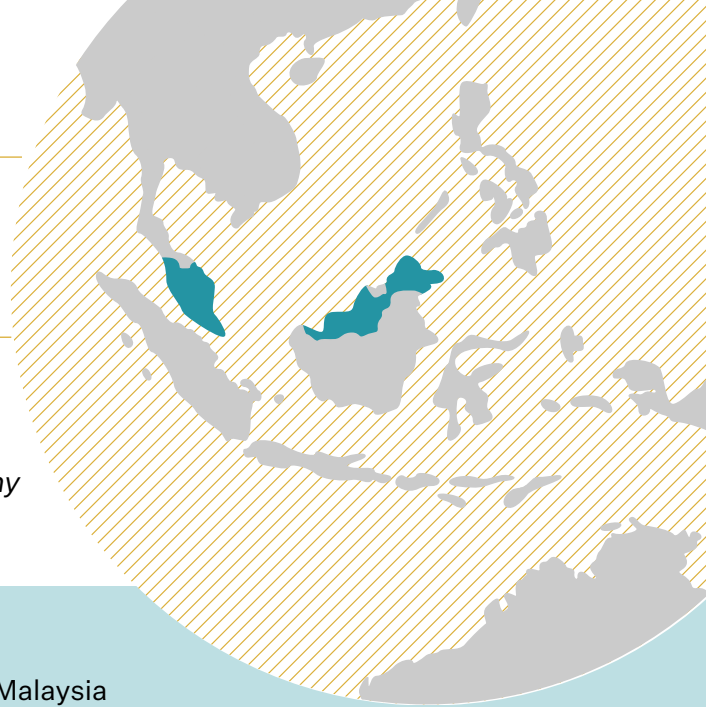## Enabling the Fourth Industrial Revolution

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Key takeaways:
- The cross-cutting guidelines and policies on AI in Malaysia have involved actors from different sectors. The Ministry of Higher Education (MoHE) and Malaysia Qualification Agency provide guidance for responsible AI use in academia.
- The approach to AI for science is focused on innovation through technology. AI upskilling is being led by both the academic and industry sectors.

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

The Malaysian government introduced the National Science, Technology and Innovation Policy (DSTIN) 2021–2030 (MoSTI, 2020) to intensify local technology development. As part of this initiative, the Malaysian Science, Technology, Innovation and Economy (10-10 MySTIE) framework developed by the Academy of Sciences Malaysia (ASM, 2020) was specifically designed to boost economic development and enhance the level of innovation, wealth generation, inclusion and wellbeing of society.

A National 4IR Policy was also developed by the Economic Planning Unit, Prime Minister's Department in 2021 (EPU, 2021a) to serve as a comprehensive national strategy for the 4IR. Aligned with the DSTIN 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.

National roadmap

The National AI Roadmap 2021–2025 (MoSTI, 2021) is an initiative aimed at developing and implementing AI in Malaysia. The roadmap is structured around several key strategies, including establishing AI governance, acculturating AI and kickstarting an AI ecosystem. It aims to create a thriving AI innovation ecosystem in Malaysia and encourage industry leaders and academicians to develop and implement AI solutions.

Seven principles of responsible artificial intelligence from Malaysia's National Roadmap

- Fairness
- Reliability
- Safety and control
- Privacy and security
- Pursuit of human benefit and happiness
- Accountability
- Transparency

These principles provide guidelines for the development of trusted and privacy-conscious AI.

The Ministry of Science, Technology and Innovation (MoSTI) established the National Blockchain and Artificial Intelligence Committee to coordinate and monitor the action plan implementation planned in the National AI Roadmap (Ministry of Communications, 2022). Additionally, the Department of Standards Malaysia, which functions as the national standards body and the national accreditation body and an agency under the Ministry of Investment, Trade and Industry, formed an AI Technical Committee with representatives from various sectors (DSM, 2023) to provide national AI standards.

To propel AI adoption, the roadmap identifies national AI use cases in supply chains, healthcare, education, agriculture and finance. The roadmap also recommends embarking on fundamental and applied research and development (R&D) in the relevant entities within the AI innovation ecosystem, and encouraging AI adoption in R&D for all fields. Each state in Malaysia has a digital transformation strategy, with states like Selangor, Sarawak, Terengganu, Penang and Melaka showing robust AI adoption due to factors such as digital labour and growing R&D awareness.

Research streams

Academic research advancement with AI is led by the Ministry of Higher Education (MoHE) and the Malaysia Qualification Agency, such as through the release of advisory notes and guidelines for scaffolding responsible use of generative AI. A cascading effect for AI transformation within higher educational institutions is conducted at each institution, such as through smart campus and digital education initiatives. MoSTI is also supporting the AI transformation for academic development and research.

One national flagship based on AI is the Digitalisation and Internet of Things (IoT) program, with a pilot project at the Pasoh Reserve Forest spearheaded by ASM. The project introduces robots, IoT systems, AI and machine learning–based systems for species digitalization, profiling and analysis, and an ecology simulator for facilitating AI-infused forest management, besides offering training programs (ASM, 2023a). A precision biodiversity alliance has also been formed as part of the change management and transformation enculturation in sustainable biodiversity and forest management.

Meanwhile, Cancer Research Malaysia (2020) has developed an AI-enabled mobile app called MeMoSA (Mobile Mouth Screening Anywhere) for early detection of oral cancers. MeMoSA collects oral lesion images and uses AI and image processing for oral cancer detection. The app has the potential to reach a large number of people in low-cost settings, making it particularly beneficial for individuals in rural areas with limited access to healthcare facilities.

Education and services

ASM has prepared a white paper titled *A New Horizon for Science, Technology and Innovation* (UPM, 2023) with recommendations to MoHE to manage technological disruptions in teaching and learning and the governance of higher education. The paper is in line with the Malaysia Higher Education Blueprint 2015–2025 (JPT, 2013), which promotes globalized online learning to provide accessible education while tailoring learning experiences to each student's needs. Recommendations address policies including on resource sharing and establishment of centres for high-end infrastructure; open education technologies policy and national open innovation platforms among many other considerations.

Digital government initiatives to support AI expansion are also ongoing. A data sharing platform called the Malaysian Government Central Data Exchange provides data integration services across agencies to facilitate the provision of end-to-end online services, led by the Digital Department under the Ministry of Digital. The Main Database platform developed by the Ministry of Economy centralizes socio-economic data for targeted subsidies, enhancing data security and consolidating management. The Malaysia Open Science Platform championed by ASM fosters a national research asset adhering to open science guidelines.

Spaces for innovation

The National Technology and Innovation Sandbox provides a 'safe place' for innovators to test and validate their tech solutions in a live environment with relaxations on regulations and laws. It is coordinated by the Malaysian Research Accelerator for Technology & Innovation and Malaysia's Applied Research and Development Centre, two agencies under MoSTI, and Futurise, a company under the Ministry of Finance. The Sandbox is open to all technologies, but priority is given to ten science and technology drivers guided by the 10-10 MySTIE. It offers capacity building programs, market access, funding facilitation, testbed and test environment facilitation, and facilitation/review of regulations and laws.

The Malaysia Development Corporation is entrusted to be the AI technology endorser with the collaboration of ministries such as the Ministry of Agriculture and Food Security,

while the strategic agency to MoSTI, MIMOS – the national Applied R&D Centre, focuses on accelerating industrial use cases. The government sector is also moving towards digital transformation with AI, managed by the Digital Department under the Ministry of Digital. The concept paper *GovTech* presents a single platform for integrated government services and outlines the strategic initiatives and innovative technology solutions offered using sophisticated and inclusive digital services (The Star, 2023).

To foster AI talent preparation and scouting for recruitment, various upskilling and reskilling data and AI literacy programs are offered by academia, industry and their combination, in the form of certifications and courses for all layers of society. For the government workforce, the National Institute of Public Administration, the training arm of the Public Service Department, has taken the lead. TalentCorp and the Malaysia Digital Economy Corporation are also actively promoting AI talent and initiatives in Malaysia. TalentCorp's Future Skills Talent Council aims to bridge the gap between graduates' skills and industry needs, and they have launched sector-focused industry–academia collaboration workshops to address talent gaps within the Malaysian workforce.

Recent events

AI events such as the Chinese Chambers of Commerce and Industry Tech Conference (ACCCIM, 2023), UK MY AI Conference 2023 (BHCKL, 2023) and ASM's AI Forum (ASM, 2023b) have highlighted examples of implemented AI initiatives and calls for closer collaboration to democratize the promises of AI for all. Talks, hackathons, intellectual discourses, forums, exhibitions and digital channels have been created to identify opportunities such as upskilling and reskilling programs, challenges such as talent gaps and infra/infostructure necessities, and best practices for AI implementation including use cases. The government is also investing in AI education and research by funding the first AI faculty in Malaysia at Universiti Teknologi Malaysia, expected to start in 2024 (Fam, 2023).

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The establishment of the Malaysia Centre4IR in MyDIGITAL (under the Ministry of Economy) is a further example of unwavering commitment by the government to foster innovation and facilitate the co-design of policies and regulatory frameworks necessary to maximize the social benefits and minimize the risks associated with these advanced technologies. The 'AI untuk Rakyat' (AI for People) program (MyDIGITAL, 2024) is another such initiative, aimed at enhancing public literacy in AI and bridging the digital divide, with a focus on inclusivity and participation in AI-related developments. The program consists of two courses, AI Aware and AI Appreciate, that are available in four local languages, based on original courses by Intel. The courses are free and compulsory for all government servants.

Harnessing artificial intelligence

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, the integration of AI into the fabric of scientific endeavours promises to unlock new frontiers of knowledge, propel economic prosperity and foster a future where innovation knows no bounds. With unwavering commitment and strategic foresight, 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.

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