AI Governance in Southeast Asia

October 2023

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FOREWORD

The ASEAN region, consisting of Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, stand to gain significant socioeconomic benefits from the increasing adoption of innovative technologies like artificial intelligence (AI). Many ASEAN member states have already formulated national AI strategies. However, levels of public awareness and understanding of AI and gaps in policy implementation vary across the region.

AI faces a fragmented policy space as countries both in the region and internationally continue to explore approaches on how to govern this emerging technology, given the unique benefits and risks posed by generative AI. The ASEAN region will likely emerge as a globally relevant test bed of a variety of governance approaches, ethical guidelines, and regulatory scope.

This report provides a snapshot of the current AI policy landscape in the region as of September 2023. The report is organized by country to enable members and other key stakeholders to have better insight into the level of AI policy development in different ASEAN member states. It also tracks government talent development initiatives and AI adoption as well as emerging developments.

As the Government of Singapore leads a regional effort to develop an ASEAN Guide on AI Ethics and Governance, the Council will continue to monitor AI policy developments in the region and support efforts to advance trust in responsible AI. This includes building trust among stakeholders through open dialogues, expanding capacity-building initiatives for technical and non-technical audiences, and strengthening public-private partnerships. I highly encourage you to reach out to our staff if you have any questions. Through knowledge sharing, strong partnerships, and consistent collaboration, we hope to support an interconnected, interoperable digital economy in ASEAN.

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BACKGROUND

Artificial intelligence (AI) has the potential to add [nearly US$1 trillion](#) to the region's GDP by 2030, equivalent to a 10 to 18 percent increase in GDP at the national level. However, many ASEAN member states are still in the early stages of AI adoption while also confronting the potential for significant workforce disruption. A 2018 report by Oxford Economics and Cisco [estimated](#) that 28 million workers across ASEAN's six largest economies are at risk of being displaced. Although the report notes that job displacement in the region is predicted to be offset by job creation within a 10-year period, these jobs are expected to require increased digital literacy and higher-order skills. As AI continues to rapidly advance, it will be increasingly important for governments to invest in retraining and upskilling initiatives, align AI principles and standards, and foster interoperability and policy harmonization to enable AI innovation and entrepreneurship while mitigating potential challenges associated with AI.

Figure 1: Estimated Economic Impact of AI by 2030
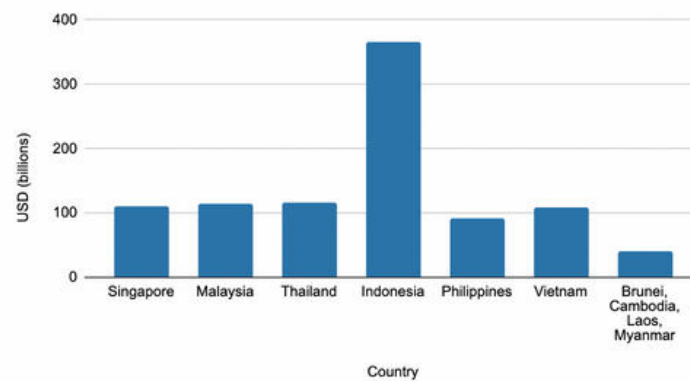
Data: Kearny and EDBI (2020)

With the rapid pace of AI advancements coupled with countries' transition to post-pandemic normalcy, some countries may also consider reviewing their national AI strategies. In May 2023, President Hammam Riza of the Indonesian Artificial Intelligence Industry Research and Innovation Collaboration (KORIKA) [highlighted](#) the importance of countries revisiting their respective national AI strategies to ensure that they remain relevant and effective in the face of ongoing developments such as generative AI.

At the regional level, Singapore has also pushed for the development of a regional AI guide to drive consensus toward a regional approach for AI governance and ethics. On February 10, 2023, the ASEAN Digital Ministers [announced](#) their intent to develop the ASEAN Guide on AI Governance and Ethics this year through a joint statement on the 3rd ASEAN Digital Ministers Meeting (ADGMIN). With the diversity of languages and cultures as well as differences in the technical, policy, and legal capacities of the ASEAN member states, the Guide has the potential to be an important guiding force in developing a strong regional consensus from which individual ASEAN member states can establish or build upon existing national approaches to AI governance. The Guide is expected to be released in early 2024 during the 4th ADGMIN in Singapore.

BRUNEI

Brunei has no national AI framework or roadmap, and there have been no signs that AI-related policy developments are underway. Under the Ministry of Development (MOD) Digital Paradigm Framework (2020-2025), Brunei seeks to strengthen the integration between policy, operations, and technology, enabling Brunei to improve service performance and provisions via smart infrastructure and emerging technology such as AI. In June 2020, the Digital Economy Council (DEC) launched the Digital Economy Masterplan 2025 to guide Brunei's digital economy initiatives and support the country's digital transformation to become a Smart Nation. The masterplan highlights four strategic thrusts, including industry digitalization with an emphasis on Industrial Revolution 4.0 technologies and manpower and talent development.

Government Initiatives

During the pandemic, the government began launching AI-enabled applications to improve healthcare and public access to information, including an AI-enabled web application to assist the Ministry of Health in mitigating COVID-19 as well as a health management mobile app originally used for contact tracing.

Talent Development

In 2022, the Brunei ICT Industry Competency Framework (BIICF) was released to serve as a guide for ICT occupations to support the Brunei Vision 2035 and Digital Economy Masterplan 2025 by providing a national standard for jobs and expected competencies for various roles in the ICT sector, including roles related to data and AI. The framework outlines work functions, technical and soft skills, entry requirements, and recommended technical training to mitigate skills gaps and mismatches among ICT graduates and professionals. Universities have also made efforts to introduce courses and degrees in artificial intelligence, and the Authority for Info-Communications Technology Industry (AITI) oversees various initiatives, such as the Digital Upskilling Program for Local Youth Jobseekers and Local Workforce (2022-2025), to provide skill-building opportunities relevant to Industry 4.0. However, many of these measures are targeted toward those already in the ICT field or with a strong STEM background rather than reskilling those whose jobs are most likely to be disrupted by AI.

CAMBODIA

Cambodia lacks a national AI framework and is still in the very early stages of AI adoption and use. Under the Cambodian Digital Government Policy (2022-2035), the government lists the development of policies and standards to develop important digital technologies as a priority action for Cambodia's digital governance, highlighting the expanded use of AI for data sharing and digital services as a key digital enabler. In May 2023, the Ministry of Industry, Science, Technology and Innovation (MISTI) released Artificial Intelligence Landscape in Cambodia: Current Status and Future Trends, detailing the local AI landscape and outlook and providing suggestions on how Cambodia can encourage the development of responsible AI that is in line with the country's development goals.

Cambodia is still in the early stages of AI development and adoption, with AI adoption largely concentrated in Cambodia's primary sectors. As Cambodia seeks to achieve upper middle-income status by 2030 and a high-income country by 2050, it will be increasingly important for Cambodia to tap into the benefits of emerging technology to enhance productivity and achieve greater economies of scale. However, Cambodia currently faces significant barriers to greater AI development and deployment, including a talent shortage and financial constraints.

Developing a National AI Policy

MISTI's 2023 report outlines various recommendations that could be incorporated under a national AI policy framework for Cambodia, highlighting the need for strategic investment across three major pillars: people, technological infrastructure, and a collaborative tech ecosystem. The report also puts forth the quadruple helix paradigm to encourage multistakeholder collaboration, building off the triple helix paradigm that has been adopted by many other countries. By incorporating civil society, in addition to stakeholders in academia, business, and government, the paradigm seeks to ensure societal needs and expectations are taken into greater account in the face of this potentially disruptive technology. The report outlines the OECD's AI principles and recommendations for government, noting concepts developed by the OECD and other major organizations should be examined in more depth as Cambodia seeks to formulate its future vision for AI adoption.

The report recommends the government focus on developing skilled AI talent and focus on AI solutions to deal with critical national focus areas before shifting to developing AI research and innovation and establishing Cambodia's position on a more global scale. Critical national focus areas identified in the report include SME services, manufacturing, transportation and mobility, education, finance and trade, healthcare, and tourism. In addition to the development of a

national framework, the report also calls for other relevant legal frameworks to be developed, including legal frameworks on cybersecurity and more comprehensive data protection to provide greater regulatory clarity and accountability.

Organizational Structure

The Cambodia Digital Economy and Society Policy Framework (2021-2035) has directed the Committee on Digital Government in coordination with the Ministry of Post and Telecommunications (MPTC), Ministry of Economy and Finance, and other relevant institutions to work on short and long-term measures to increase AI utilization in data-driven governance systems and infrastructure investment. MISTI's recent report recommends that Cambodia's AI regulations and guidelines be developed by a multi-ministry committee, highlighting potential responsibilities to be undertaken by MISTI, MPTC, and the Ministry of Education, Youth, and Sport.

Talent Development

Cambodia faces a significant shortage of local tech talent, with only 10.7 percent of Cambodia's labor force estimated to be engaged in medium- and higher-level technical occupations. Some local universities, including the Cambodia Academy of Digital Technology and the Institute of Technology of Cambodia, have begun to offer courses on AI to help develop local talent. To facilitate greater opportunities for upskilling and reskilling, MISTI's report proposes launching digital literacy programs, promoting STEM education, fostering international collaborations via scholarships and grants, and pursuing educational reform to ensure greater integration of AI programs into school curricula at the primary, secondary, and tertiary levels.

Government Initiatives

In March 2023, the Ministry of Post and Telecommunications (MPTC) shared that the Digital Government Committee had been utilizing ChatGPT to ease the ministry's workload over the past six months, including supporting administrative and translation tasks. The committee has also begun discussions with OpenAI about developing a Khmer language version of ChatGPT to be made available to the public.

INDONESIA

In August 2020, Indonesia released the National Strategy for Artificial Intelligence (2020-2045) to harness the potential of AI to drive domestic economic growth and technological development. The national strategy aims to build on existing government initiatives to advance AI development and integration by both the public and private sectors. President Jokowi has urged the acceleration of Indonesia's AI capabilities, previously comparing the competition to control AI to the Space Race and the Cold War.

A 2018 survey by the International Data Corporation found that Indonesian companies had the highest rate of AI adoption in Southeast Asia. However, Indonesia is projected to face a projected 9 million shortage in skilled and semi-skilled workers between 2015 and 2030, posing challenges to the country's ability to fully integrate AI across different sectors and use cases.

National Strategy

The National Strategy for Artificial Intelligence (Stranas KA) seeks to align Indonesia's national AI strategy with ongoing digital developments and support efforts to achieve Indonesia's broader development strategy, Vision of Indonesia 2045. Stranas KA outlines five national priorities where AI is expected to have the largest impact: health services, bureaucratic reform, education and research, food security, and mobility and smart cities. The strategy also highlights infrastructure and data, ethics and policy, research and innovation, and talent development as key focus areas. Over 180 programs, pilot schemes, and policies are identified in the national strategy, including the proposed establishment of a data ethics board to oversee AI development and create regulations and standards to support AI innovation.

Organizational Structure

The development of Stranas KA was coordinated by the Agency for the Assessment and Application of Technology (BPPT), which facilitated discussions amongst a working group comprised of various public and private stakeholders prior to the national strategy's release. Given the number of programs, pilot schemes, and policies identified in Stranas KA, responsibilities have been delegated across a wide range of ministries.

Under Stranas KA, the Artificial Intelligence Innovation Centre (PIKA) was created, with one of its main deliverables to be the creation of an orchestrating organization to help oversee the implementation of Stranas KA. In August 2021, the Artificial Intelligence Industry Research and Innovation Collaboration (KORIKA) was established to foster AI innovation and encourage AI

adoption across various sectors through facilitating a quadruple helix AI ecosystem between government, industry, academia, and communities.

Talent Development

Given Indonesia's AI talent gap, the government has launched several initiatives to encourage the development of AI talent and digital skills development more broadly. Under the Digital Indonesia Road Map (2021-2024), the Ministry of Communication and Informatics (KOMINFO) launched several programs to close Indonesia's digital talent gap, including the Digital Talent Scholarship (DTS). Indonesia has also sought to cooperate with international partners on talent development in the technology sector. The government has also launched the Indonesia AI Research Consortium and Artificial Intelligence Center Indonesia (AiCI) to encourage greater research and human resource development in the AI field.

Stranas KA builds upon these existing efforts, emphasizing the need to bridge the gap between industry needs and talent supply through various initiatives, including developing a national talent management system, AI competency standards, incentive schemes for research talent, and an integrated learning ecosystem.

Government Initiatives

Government adoption of AI and other emerging technology has been encouraged under Presidential Regulation No. 95/2018 on E-Government. The government has sought to integrate AI systems into several public services and tools, including public service portals, food data processing, and natural resource monitoring. Under the Blueprint for Digital Health Transformation Strategy 2024, Indonesia also aims to implement an AI-based health analysis system from 2023 to 2024 at the central and local levels as it seeks to establish more integrated health data and services.

AI has also become a key component of Indonesia's smart city developments, including the Jakarta Smart City (JSC) initiative. Under the JKC initiative, several AI projects have been rolled out, including traffic and rainfall prediction, transportation safety and vehicle tax revenue estimation, citizen feedback categorization, chatbots, and COVID-19 crowd detection.

Recent Developments

On August 30, KOMINFO announced that it is developing ethical guidelines on the use of AI. The ethical guidelines are also expected to touch on ensuring that the ethical use of AI is in line with existing policies, including the Personal Data Protection Law (PDPL) and Electronic Information and Transactions (ITE) Law. KOMINFO Deputy Minister Nezar Patria has noted data scraping's potential violation of personal data protection provisions under PDPL.

LAO PDR

Laos has no national AI framework or roadmap. The country shows low levels of preparedness, ranking 129th of 181 countries in the 2022 Oxford Government AI Readiness Index, behind all other ASEAN member countries except Cambodia. Government focus remains largely on broader advancements to advance digital transformation and grow the digital economy. Compared to its regional peers, Laos faces significant challenges in relation to internet accessibility, quality, and affordability, with estimated costs being equivalent to 27 percent of average household income in 2017.

Under the National Digital Economy Development Vision 2040 (2021-2040), Laos seeks to expand its digital economy from 3 percent to 10 percent of GDP by 2040. The Digital Economy Strategy (2021-2030) and the National Digital Economy Development Plan (2021-2025) outline the need for Laos to develop digital infrastructure and policies, expand high-speed internet access, promote digital technology skills, and increase public awareness of digital technologies. According to the 2022 UN E-Government Survey Member State Questionnaire (MSQ) submitted by Laos, the government intends to establish regulation on emerging technology, including AI, under its draft development plan, but public details have yet to emerge.

Talent Development

ICT workforce development programs are limited throughout Laos. Under the National Digital Economy Plan (2021-2025), Laos seeks to increase its digital workforce from 0.3 percent to 1 percent of the total workforce. Technological skills and the concept of STEM are rarely included in primary school curriculum due to limited government investment in school technology equipment. The problem similarly persists at a university level, with ICT-related degrees remaining a small proportion of the overall degrees currently offered. A 2016 household survey by the World Bank found that less than 0.5 percent of employment in Laos was in the ICT sector.

Recently, Laos has made efforts to collaborate with foreign universities to foster greater talent development and research opportunities related to AI. The Lao-Korean College is affiliated with the Institute of Advanced Technology Education & Research (iATER), which has been working with Korean universities through joint research opportunities, such as Lab AI, since late 2020. In February 2023, the Research Institute for Smart Technology under the Ministry of Technology and Communications (MoTC) and the Chongqing College of Electronic Engineering in China signed a memorandum of understanding (MoU) with key points related to artificial intelligence. Through the MoU, Chongqing College will provide technical training and education programs for the

development of smart technology-related human resources in Laos. The college will also support MoTC by providing facilities and infrastructure, including AI laboratories.

AI Adoption

AI adoption in Laos is limited. In January 2021, Laos opened a smart expressway in partnership with Yunnan Construction. Technology partners Huawei and Yunnan Huayuan Electronics Co Ltd intend to upgrade smart traffic monitoring and emergency response components through the integration of 5G and AI technologies. Smart city projects in Vientiane and Luang Namtha and Oudomxay provinces were also put forth in 2021, presenting the potential for greater AI adoption in Laos. A smart city project is underway in Luang Namtha province, focusing on establishing e-government practices from 2021-2025 to improve people's quality of life and business.

MALAYSIA

Malaysia has yet to release its National AI Framework (NAIF), which was expected to guide the development of Malaysia's AI ecosystem. In March 2021, the Ministry of Science, Technology, and Innovation (MOSTI) issued the Malaysia National AI Roadmap 2021-2025 (AI-Rmap), a living document that seeks to guide Malaysia's AI development and adoption and support Malaysia's goal of becoming a high-tech nation by 2030. Under the National 4th Industrial Revolution (4IR) Policy, artificial intelligence was identified as one of five foundational 4IR technologies. In addition to the National 4IR Policy, the AI-RMap aligns with the aims of the National Policy on Science, Technology, and Innovation (DSTIN) 2021-2030, the 10-10 Malaysia Science, Technology, Innovation, and Economy Framework (10-10 MySTIE), Malaysia Digital Economy Blueprint, and other national policies and programs that support AI development and implementation.

The Malaysia Digital Economy Corporation (MDEC) was set to complete the National AI Framework (NAIF) by the end of 2019 and establish a dedicated unit consisting of local and international experts to support NAIF but has yet to publicly release the framework. NAIF is believed to outline 20 initiatives that span across six key building blocks and five goals related to the economy, government, industry, and public and society.

The 2021 Malaysian Artificial Intelligence (AI) Roadmap Survey found that over 50 percent of organizations surveyed were behind in AI technology application, with many organizations' budget allocations for AI-related projects making up less than 5 percent. Lack of AI talent and expertise as well as lack of funding remain major barriers to AI adoption, and substantial gaps between government and private sector adoption were present.

National Roadmap

By 2025, Malaysia seeks to create a self-sustaining AI Innovation Ecosystem for AI development, leveraging collaboration between government, academia, industry, and society while being guided by Responsible AI Principles. The AI-RMap outlines seven key principles to guide responsible AI use and innovation, including fairness, transparency, accountability, and privacy and security. Six strategies are detailed to support Malaysia's AI innovation system related to AI governance, research and development, digital infrastructure, talent development, acculturation, and multistakeholder collaboration.

The AI-Rmap recommends an annual economic impact assessment to measure the progress of the roadmap's implementation, proposing that the assessments begin during Horizon 2 (2023-

2024). During Horizon 2, Malaysia is also expected to put greater emphasis on emerging opportunities that require substantial investment. Five national priority areas have been identified for AI adoption, namely agriculture and forestry, medical and healthcare, smart cities and transportation, education and public service.

Figure 2: AI Coordination and Implementation Unit (AI-CIU) Governance Structure

Source: Ministry of Science, Technology, & Innovation, Malaysia National AI Roadmap 2021-2025

Organizational Structure

Currently, Malaysia lacks a centralized AI governance coordination structure. The AI-Rmap was designed by experts from the Universiti Teknologi Malaysia and supported by consultants from the National Tech Association of Malaysia and the Ministry of Science, Technology and Innovation's (MOSTI) National Science and Research Council. Under the AI-Rmap, lead agencies and collaborators include the Ministry of Science, Technology, and Innovation (MOSTI); MDEC; Ministry of Investment, Trade, and Industry (MITI); Malaysian Communications and Multimedia Commission (MCMC); Ministry of Higher Education (MOHE); and Ministry of Human Resources (MOHR).

The establishment of the AI Coordination and Implementation Unit (AI-CIU) is listed as a target under Horizon 1 (2021-2022) of the AI-Rmap. The AI-CIU will become the main government body responsible for matters related to AI and will be answerable to the Minister of Science, Technology, and Innovation. Once established, the AI-CIU will be tasked to establish a Foresight Committee and later establish ad hoc committees based on anticipated priorities, such as research and development (R&D), ethics, and talent development.

The Malaysian Standards Department (JSM) has recently established a National Mirror Committee to develop national AI standards. The committee is chaired by MIMOS, Malaysia's national applied research and development center, and consists of representatives from MOSTI, other government agencies, academia and industry.

Talent Development

AI talents in Malaysia have traditionally been sourced by upskilling employees, industry-university partnerships, and advertisements. The AI-Rmap seeks to develop AI talents through comprehensive and inclusive AI education, reskilling and upskilling employees, and attracting overseas talent. In addition to strategic initiatives outlined in the AI-Rmap, Malaysia has launched various tools and initiatives to encourage AI talent development, including the MyIndustry AI Scholarship Program and Digital Skills Training Directory by MDEC.
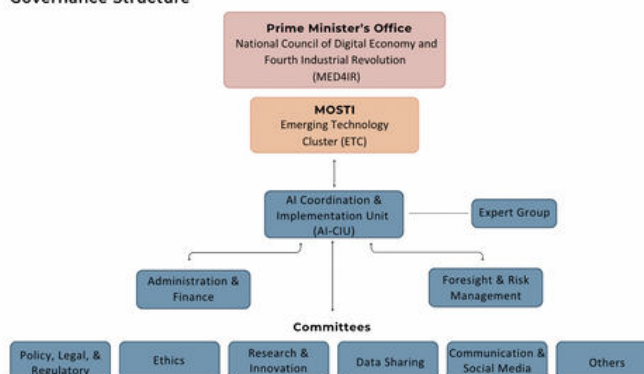
Government Initiatives

The government has also launched tools and programs aimed at making AI more accessible to encourage greater industry adoption. In 2021, MDEC launched the Data, Analytics, Artificial Intelligence (AI) Readiness Assessment Tool with the support of the International Data Corporation (IDC) to enable enterprises and organizations to become Industrial Revolution 4.0-ready by better understanding their data, analytics, and AI readiness and identifying strengths and areas for improvement. In 2021, the Malaysian Investment Development Authority (MIDA) launched the AI for SMEs (AI4S) Program in collaboration with Intel Malaysia and Malaysia Productivity Corporation (MPC) to enable SMEs to implement AI pilot projects using Intel's AI Starter Kit.

Outside of capacity-building initiatives for businesses and individuals, government organizations at the national and state level have begun to adopt AI for several use cases, including traffic management, an integrated immigration system, and pilot sentencing tools for judicial use.

In June 2023, Minister of Higher Education Khaled Nordin shared that MOHE had issued and distributed a set of guidelines on the use of ChatGPT to institutions of higher learning (IPTs), detailing cases where the chatbot can and cannot be used.

Recent Developments

Malaysia aims for the AI industry to create 10,000 jobs and lead to 30 percent growth in the local economy. In July 2023, Minister of Science, Technology, and Innovation Chang Lih Kang told local media that the MOSTI is considering spearheading the drafting of a bill to regulate AI, including requiring the labeling of AI-generated content to increase transparency and engaging in multistakeholder discussions to ensure regulatory action is robust and relevant. MOSTI is currently working with Universiti Teknologi Malaysia as well as representatives from government agencies, academia, and industry to develop a code on AI governance and ethics. This governance and ethics code will form the basis of Malaysia's AI regulation and is expected to be ready by 2024.

MYANMAR

Myanmar has no national AI framework or roadmap, and there have also been no signs that AI-related policy developments are underway. AI adoption is limited due to financial, human capital, and physical capital constraints as well as limited awareness among the general public. Although Myanmar has yet to issue policies to support the development of AI, the government had released several plans and strategies related to the digital economy, such as the Myanmar Digital Economy Roadmap and Universal Service Strategy (2019-2023), which provide Myanmar the opportunity to establish a stronger foundation from which to encourage local AI development and use. Myanmar's rapid increase in its rate of smartphone penetration presents an opportunity for digital and financial leapfrogging, enabling the country to accelerate its pace of development and change via technology. However, AI adoption is still limited, with many use cases, such as AI-enabled chatbots, coming from foreign companies that have done business in Myanmar.

Talent Development

Educational opportunities and initiatives related to AI are limited, with some universities offering diplomas or courses in AI, including the Myanmar Institute of Business and University of Yangon. In the National Education Strategic Plan for 2016-2021, ICT and digitalization are mentioned in relation to improving digital access and facilities, but the plan makes little mention of employer demand for digital skills and competencies necessary for AI-related professions. Additionally, frequent internet disruptions, rising internet prices, and slowing internet connections since February 2021 have placed major barriers on workers' ability to access digital educational resources.

THE PHILIPPINES

In 2021, the Department of Trade and Industry (DTI) launched the Philippines' Artificial Intelligence Strategy Roadmap to prepare the country for the Fourth Industrial Revolution through its commitment to progress in the new "nation defining capability." According to Trade Undersecretary Rafaelita Aldaba, AI could likely contribute US$92 billion, approximately 12 percent of the Philippines' GDP, to the economy by 2030. Prior to the roadmap's release, the Philippines spent less than 0.2 percent of its annual GDP on AI research and development (R&D), far below the global benchmark of 1-2 percent. Compared to regional leader Singapore which spent US$68 per capita on AI investment in 2019, the Philippines spent less than US$0.01 per capita on AI during the same period. The national AI roadmap cites a relative lack of R&D personnel and weak data infrastructure and governance as major inhibiting factors to previous AI investment and progress. The strategy targets AI investment as a key area for increased public spending given AI's critical role in the Fourth Industrial Revolution and its potential multiplier effect in advancing workforce development. Civil society organizations, such as the Alliance for Technology Innovators, have also shown increased interest in AI, including its impact on the future of work and key ethical considerations.

National Roadmap

The National AI Strategy Roadmap underscores the need for a triple-helix approach to R&D collaboration among government, industry, and academia partners to propel national AI development and increase digital competitiveness. The roadmap provides a framework for investments, infrastructure, and implementation in four dimensions of AI readiness: digitization and infrastructure, research and development (R&D), workforce development, and regulation. These priority areas are supported by seven measurable strategic imperatives and forty-two strategic tasks assigned to various government departments. The Philippines' approach to AI regulation is also guided by its White Paper on Developing an AI Governance Framework, a living document outlining governance principles released in 2022.

A key policy prescription of the roadmap is the establishment of the Center for AI Research (CAIR) under the Department of Trade and Industry (DTI). The center will serve as a public-private partnership hub for data scientists and researchers to perform collaborative AI R&D and technology application among government agencies, researchers, universities, research institutes, start-ups, and multinational companies. CAIR is also expected to build and administer both the National Data Center (NDC) and the National Research Cloud (NRC). According to the framework, the hub will also offer consultancy services and AI tech products to support the

digital transformation of industries to help generate investments and employment in the country and seek to attract leading global firms to set up their R&D activities in the country. The hub is expected to be a center for talent development, including data literacy programs and learning modules aimed at reskilling and upskilling Filipinos. As of June 2022, the private sector has committed to invest US$20 million to help establish the center. However, the funding for the CAIR has yet to be approved by the Department of Budget and Management.

Organizational Structure

Along with mandates for increased funding and the establishment of the CAIR, the AI roadmap also outlines the need for a council to steer and oversee the implementation of the national strategy. The body would be composed of representatives from government, industry, and academia. Key government agencies include those assigned strategic tasks in the roadmap: the DTI, Department of Information and Communications Technology (DICT), Department of Science and Technology (DOST), Commission on Higher Education (CHED), National Economic and Development Authority (NEDA), and Technical Education and Skills Development Authority (TESDA).

Talent Development

A May 2023 report by Access Partnership estimated that generative AI alone may unlock US$79.3 billion in productive capacity in the Philippines; however, only an estimated 40 percent of Filipinos are equipped with at least one of six basic ICT skills. Universities, including the country's national university, the University of the Philippines, offer graduate degrees in AI. Under the Philippine Skills Framework Initiative, the DTI has worked in collaboration with the Analytics Association of the Philippines (AAP) to establish a framework for analytics and AI to guide workers in enhancing skills necessary for related jobs. TESDA is currently developing the National Technical Education and Skills Development Plan (NTESDP) 2023-2028 to provide guidance to the technical and vocational education and training (TVET) sector, with the plan expected to focus on digitalization in response to the Fourth Industrial Revolution.

As one of the four key pillars of AI readiness, workforce development is a key priority in the national AI strategy. The roadmap emphasizes the need to better incorporate Data Science and Analytics (DSA) foundations in secondary education, properly train teachers in AI, reskill and upskill the existing workforce, and increase the number of research-oriented graduate students in AI fields. These priorities are assigned to the government departments identified earlier (DICT, DTI, CHED, TESDA, DOST, and NEDA) as well as the Department of Labor and Employment (DOLE) and Department of Education (DepEd). According to the strategy, TESDA will seek to establish sector skills councils, recognized industry boards, or associations that can provide specific learning and development programs for workers and employers.

Other talent development initiatives include:
- **DOST AI Pinas Trainings**: DOST has hosted three AI Pinas trainings in collaboration with the Development Academy of the Philippines (DAP), the Analytics Association of the Philippines

(AAP), and Coursebank. The trainings are part of the [Smarter Philippines through R&D, Training, and Adoption (SPARTA) project](#) which aims to train 50,000 Filipino data scientists by 2029 to meet the needs of the industry moving towards a digital transformation.

- **DOST-SEI scholarships and programs**: DOST Science Education Institute (DOST-SEI) offers several [scholarships](#) targeted to students pursuing graduate studies in STEM fields and hosts [capacity-building programs](#) for science and technology teachers.
- **IBPAP partnership**: CHED, TESDA, and DepEd have also partnered with non-governmental organization IT and Business Process Association of the Philippines (IBPAP) to upskill the existing workforce. Initiatives under this partnership have included working to [embed](#) training programs designed by the IT-BPM sector into higher education curriculum.
- **Intelligent Systems Laboratory (ISL)**: On March 1, 2023, DOST inaugurated the P5-million ISL in collaboration with the Mindanao State University – General Santos City (MSU-GSC). The establishment of the research hub will facilitate research activities in artificial intelligence, robotics, and automation.
- **[Philippine Space Agency Pagsasanay para sa Kalawakan program](#)**: The Philippine Space Agency Space Security Technologies Division (PhilSA SSTD) has used its "Introduction to AI Training Series" to train government agencies including the national police, coast guard, the Naval Research and Technology Development Center (NRTDC) and the Philippine Air Force Research and Development Center (AFRDC).

Government Initiatives

Following the publication of the national strategy, in June 2021, DOST Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD) launched its first round of AI infrastructure capacity programs. The nine programs [focused](#) on the health, [transportation](#), environmental protection, and scientific development sectors. Among these initiatives is the Philippine Sky Artificial Intelligence Program (SkAI-Pinas). Its main research component is the [Automated Labeling Machine – Large-Scale Initiative (ALaM-LSI)](#), conducted in partnership with the DOST Advanced Science and Technology Institute (DOST-ASTI). The program has produced several AI-powered innovations for agricultural risk monitoring, [presented](#) at the Consumer Electronics Show in January 2023. DOST-ASTI has also begun to develop a natural language interface to relational databases (NLIDB) called [iTANONG](#) powered by AI. The Philippine National Police (PNP) have used AI in [monitoring drones](#) and intends to expand adoption to [cyber-crime prevention efforts](#). AI-powered tools have also been implemented in [rail safety features](#) by the Philippine National Railways.

Recent Developments

As rapid AI advancements have led to increased public attention and scrutiny, several lawmakers have brought forth bills to address AI development and regulation. In March 2023, H.B. 07396 was [filed](#) in the Philippines House of Representatives, which calls for the creation of an Artificial Intelligence Development Authority (AIDA) responsible for the development and implementation of a national AI strategy. In May 2023, [H.B. 07913](#) was filed, seeking to establish a regulatory framework for AI development, application, and use.

SINGAPORE

In 2019, Singapore announced the National Artificial Intelligence Strategy (NAIS), which aims to position the country as a global hub for AI solutions by 2030. The strategy is part of Singapore's broader Smart Nation plan to transform Singapore through technology. The country's coordinated effort to encourage innovation and the responsible use of AI has earned it top places in global AI governance rankings. In the 2022 Oxford Insights' Government AI Readiness Index, Singapore ranked second globally, signaling its government's high degree of readiness to implement AI in delivering public services. Singapore trailed behind the United States in only one of three pillars assessed—the technology sector pillar. The government's commitment to AI implementation and interest in training highly skilled AI talent as outlined in the NAIS has been complemented by large-scale investments in AI development, implementation, and workforce education. Over the last five years, the government has invested approximately S$500 million (US$368 million) into AI research and development.

Singapore has positioned itself as a thought leader in AI governance and ethics, engaging in international forums such as the Global Partnership on Artificial Intelligence (GPAI). Via the ASEAN Digital Ministers Meeting (ADGMIN) platform, Singapore initiated the development of a regional guide on AI ethics and governance in 2023, with the final version of the guide expected to be released in early 2024.

National Strategy

The NAIS defines nine key sectors where focused AI innovation and implementation will yield the most social and economic benefits for Singaporeans: transport and logistics, manufacturing, finance, safety and security, cybersecurity, smart cities and estates, healthcare, education, and government. Innovation within these sectors is dependent upon the development of a vibrant and sustainable AI ecosystem, with AI talent and education, data architecture, multi-stakeholder partnerships, international collaboration, and the development of a progressive, trusted environment identified as key enablers. The NAIS outlines an initial group of five national AI projects for consideration: intelligent freight planning, efficient municipal services, chronic disease screening and management, personalized education, and enhanced border clearance operations. The strategy envisions progress on these five projects among its broader mandate to identify other opportunities for scalable and impactful AI solutions by 2030.

Organizational Structure

The National AI Office (NAIO) under the Smart Nation and Digital Government Office (SNDGO) was formed in 2019 to set Singapore's national agenda for AI and catalyze efforts across various stakeholders to work on national AI priorities. NAIO also collaborates with the Infocomm Media Development Authority (IMDA) and the Personal Data Protection Commission (PDPC), which leads the charge on guidance and regulations related to responsible, trusted AI. The three agencies report to the Minister of Communications and Information Josephine Teo, who holds the concurrent position of Minister-in-charge of the Smart Nation Initiative. SNGDO and its implementing arm, the Government Technology Agency (GovTech), are set to merge with the digital development functions of the Ministry of Communication and Information (MCI) to form an expanded Smart Nation Group. No changes are expected to occur to the status or structures of the statutory boards and agencies under the MCI, SNGDO, or GovTech.

Established in 2018, the Advisory Council on the Ethical Use of AI and Data is also a key player in guiding AI policy. Members of the Advisory Council include Alibaba Group, DBS Group, Google, Microsoft, Temasek International, and Singapore University of Technology and Design. The Advisory Council advises the government on issues arising from the commercial deployment of AI that may require policy or regulatory attention, working closely with the IMDA and PDPC. They also support and engage industry on the responsible development and deployment of AI. Government agencies, such as MOH and MAS, have also played key roles in developing sector-specific guidance.

Responsible AI

In 2020, Singapore's Personal Data Protection Commission (PDPC) released the second edition of the Model AI Governance Framework to provide policymakers and industry actors with practical tools to address current and potential AI challenges, with the goal of facilitating trust in the use of AI technologies. The framework is grounded in two principles: 1) AI actors should ensure the decision-making process is explainable, transparent, and fair and 2) AI solutions should be human-centric. The government has worked to provide tools to help AI actors ensure that their products are attentive to these principles.

In May 2022, Minister of Communications and Information Josephine Teo announced the launch of AI Verify at the World Economic Forum's Annual Meeting in Davos. AI Verify is a voluntary AI governance testing framework and toolkit. The tool seeks to enable trust-building by encouraging greater transparency, accountability, and safety through the verification of the performance of an AI system against developers' claims. In June 2023, Minister Teo announced the establishment of the AI Verify Foundation to promote the development of tools for responsible AI and boost AI testing capabilities to meet the needs of companies and regulators globally. The seven pioneering members include IMDA, Aicadium (Temasek's AI Centre of Excellence), IBM, Microsoft, Google, Red Hat, and Salesforce. At the Foundation's launch, IMDA also released a discussion paper co-written with Temasek's AI Center of Excellence Aicadium, on generative AI, which details opportunities and risks associated with generative AI and the ways in which Singapore's

approach to generative AI fits into its existing governance frameworks.

Sector-specific Guidance

The NAIS also lays out the intent to develop sector-specific AI governance frameworks and publish assessment guides for organizations to assess their AI governance processes in line with the Model AI Governance Framework. Thus far, Singapore has released principles and guidelines for the financial services and health sectors. In 2018, the Monetary Authority of Singapore (MAS) released the Principles to Promote Fairness, Ethics, Accountability, and Transparency (FEAT) in the Use of Artificial Intelligence and Data Analytics in Singapore's Financial Sector to serve as a foundational framework for consideration as an increasing number of financial institutions utilize AI and data analytics. Announced in 2019, the Veritas Initiative acts as an extension of the NAIS, aiming to create a framework in partnership with the financial industry for the responsible use of AI and the incorporation of FEAT principles into AI and data analytics (AIDA) solutions. The first phase concluded in 2021 with the publication of two white papers. In June 2023, MAS released the Veritas Toolkit version 2.0, an open-source toolkit to enable the responsible use of AI in the financial industry, and published a white paper detailing key lessons learned by leading financial institutions. The consortium included 31 financial industry players, with Accenture and Bank of China as the main developers of the toolkit. BNY Mellon, DBS Bank (DBS), OCBC Bank (OCBC), and United Overseas Bank Limited (UOB) also contributed to the pilot testing of this toolkit.

In 2021, the Ministry of Health (MOH) published the Artificial Intelligence in Healthcare Guidelines (AIHGle) in collaboration with the Health Sciences Authority (HSA) and the Integrated Health Information Systems (recently relaunched as Synapxe). The AIHGle seeks to share best practices for developers and implementers of AI in healthcare. It also complements the existing HSA regulatory requirements for AI Medical Devices (AI-MDs). Other related guidelines include regulatory requirements for Software Medical Devices (SaMDs) published by HSA. Updated in April 2022, the Regulatory Guidelines for Software Medical Devices - A Life Cycle Approach provide clarity on the regulatory requirements for software medical devices in their entire life cycle. The Guidelines offer guidance on the division of responsibilities at the development and deployment stages of AI Medical Devices (AI-MDs). In May 2023, the Bioethics Advisory Committee opened a two-month public consultation following the release of a consultation paper on ethical, legal, and social issues related to the use of big data and AI in human biomedical research. A final advisory report will later be issued to guide various stakeholders in the field on the use of big data and AI.

Talent Development

Talent development in AI is a key pillar of the NAIS, focused on providing basic AI literacy to students from a young age, upskilling Singaporeans for higher value-added AI careers, and attracting high-quality global AI talent. In recent years, IMDA has launched a variety of programs to support these priorities in partnership with other organizations. Programs aimed at reskilling and upskilling Singaporean professionals in the AI field include the SkillsFuture for Digital Workplace program, the AI Apprenticeship Program (AIAP) hosted by AISG, and the National

Research Foundation's (NRF) [AI Fellowship](#). The [TechSkills Accelerator (TeSA)](#) similarly seeks to encourage the acquisition of relevant in-demand skills, offering job placement as well. Additional partnerships aimed at training professionals with industry experience as AI PhDs have been developed with industry partners such as Alibaba, Nvidia, SenseTime, and Grab. Other programs such as [SGInnovate](#) and AI Singapore's (AISG) [Learn AI platform](#) offer opportunities for individuals to engage in talent development programs and knowledge-sharing sessions, some aimed specifically at young learners. In October 2022, Deputy Prime Minister and Coordinating Minister for Economic Policies Heng Swee Keat [announced](#) additional commitments in which the government planned to invest US$50 million in developing local AI talent and double the number of AI apprenticeships by 2027. At the time of the announcement, Singapore had invested more than US$450 million in AI research and development in the preceding five years.

In April 2023, Singapore [introduced](#) a new visa scheme aimed at attracting global talent in fields including AI and ICT. The scheme includes new bonus criteria for fresh employment pass (EP) applicants who possess skills in shortage in Singapore. The jobs detailed on the [Shortage Occupation List (SOL)](#) include cybersecurity and cyber risk professionals, AI engineers and scientists, and systems and software development specialists. The visa scheme complements the existing Tech@SG Programme in which the Economic Development Board (EDB) and Enterprise Singapore (ESG) help facilitate EP applications for prospective employees for fast-growing tech companies.

Government Initiatives

- [AI Singapore (AISG)](#): The national program was launched in 2017, seeking to further collaboration between researchers and industry. AISG offers research grants, AI PhD fellowships, innovation, and talent development-related programs for Singaporeans.
- [National AI programs](#): In 2021, two additional national AI programs were announced as updates to the original programs outlined in the NAIS. These new programs focus on government and financial sector AI adoption. The announcement also highlighted the development of SELENA+, an AI tool used in health screening, and OneService Chatbot, a reporting tool for municipal issues.
- [Smart Urban Co-Innovation Lab](#): Southeast Asia's first industry-led lab for smart city solutions development was initiated by CapitaLand Investment (CLI) and supported by CapitaLand Ascendas Real Estate Investment Trust, IMDA, and Enterprise Singapore (ESG). The lab focuses on smart city solutions including advanced manufacturing, cloud computing, healthcare, intelligent estates, smart mobility, smart wellness, sustainability, urban agriculture, and urban logistics.
- [SMU-A*STAR Joint Lab in Social & Human-Centric Computing](#): Hosted by the Agency for Science, Technology and Research (A*STAR) and Singapore Management University (SMU), the S$10 million (US$7.5 million) lab researches computational social science and human-AI synergy and their use to best enable the deployment of AI-based assistive technologies for human tasks.

- Artificial Intelligence Government Cloud Cluster (AGCC): Announced in May 2023 and hosted by SNDGO and Google Cloud, the platform is designed to accelerate AI adoption in Singapore's public sector. It has been implemented for use by Singapore's government agencies and research, innovation, and enterprise (RIE) ecosystem. The Government Technology Agency (GovTech) is the first public sector organization to use the AGCC and is exploring the use of its models in Pair, which was announced in February 2023 to enable civil servants to boost productivity with the use of large language model-powered assistants while safeguarding privacy, security, and confidentiality.

Recent Developments

On August 31, PDPC ended a public consultation for the proposed Advisory Guidelines on the Use of Personal Data in AI Recommendation and Decision Systems. The proposed guidelines are not legally binding, providing guidance on how the PDPC interprets provisions of the Personal Data Protection Act 2012 (PDPA) throughout the AI lifecycle to encourage organizations to comply with transparency and explainability standards and enable customers to know when and how AI is being used to process personal data.

During the October 2023 U.S.-Singapore Critical and Emerging Technology (CET) Dialogue, Singapore and the U.S. announced they will strengthen cooperation in AI to foster a more conducive environment for AI deployment and innovation. The two countries seek to expand bilateral research collaboration and establish a bilateral AI Governance Group to promote AI safety and innovation. The next CET dialogue will be held in Singapore in 2024.

THAILAND

In July 2022, the Prime Minister's Cabinet Office approved the National AI Strategy and Action Plan (2022-2027), aimed at promoting AI development and application to enhance Thailand's economy and quality of life by 2027. Thailand's drop in the Government AI Readiness Index has been cited as a motivating factor behind the development of Thailand's national AI strategy, seeking to use the national strategy as an opportunity to align its vision and take a more coordinated strategy with measurable goals. In the 2022 Government AI Readiness Index, Thailand ranked 31st globally, up from 59th in 2021, primarily due to a significant increase in the government pillar. Over the last three years, there has been over US$200 billion in government funding for AI-related research projects.

National Strategy

The National AI Strategy and Action Plan seeks to bolster Thailand's human capacity and technology, economic growth, and social and environmental impact. The document outlines five strategies: 1) preparing the country's readiness in social, ethics, law, and regulation for AI application, 2) developing national infrastructure for sustainable AI development, 3) increasing human capacity and improving AI education, 4) encouraging AI technology and innovation development, and 5) promoting AI adoption by both public and private sectors.

The national AI strategy also details 15 work plans across the five strategies, including increasing Thailand's AI competitiveness via AI applications with a minimum aggregate valuation of 60 billion baht (US$1.7 billion) and developing at least 100 R&D prototypes. Under the first phase (2022-2023) of the Plan, Thailand will focus on three key industries: government services, food and agriculture, and healthcare and medical. Under the second phase (2023-2027), Thailand also plans to put greater emphasis on research and development and AI applications across additional target sectors including energy and environment, tourism and creative economy, logistics and transportation, manufacturing, security, finance and commerce, and education.

Developing Ethical AI

In 2019, the Ministry of Digital Economy and Society (MDES) worked in coordination with experts from Mahidol University and Microsoft Thailand to develop the Thailand AI Ethics Guidelines, covering six aspects of AI development: competitiveness and sustainable development; legal regulations and international ethical standards; operational codes and duties; security and privacy; equality, diversity, and fairness; and credibility. The draft guidelines seek to provide a manual and ethical codes for AI development for government agencies, private firms, regulatory

bodies, researchers, designers, developers, and users but have yet to be approved by the Cabinet.

Organizational Structure

Thailand's national AI strategy was developed in coordination by the Ministry of Higher Education, Science, Research, and Innovation (MHESI) and the Ministry of Digital Economy and Society (MDES). The National AI Committee under the National Digital Economy and Society Committee (NDESC) was appointed in August 2022 to serve as a driving committee for the implementation of Thailand's national AI strategy, with the Prime Minister serving as Chairman of the committee and Deputy Prime Minister and Minister of Foreign Affairs serving as Vice-chairman. The MHESI National Science and Technology Development Agency (NSTDA) and the MDES Office of the National Digital Economy and Society (ONDE) are assigned to serve as secretaries for the committee. The National AI Committee is also comprised of several AI subcommittees focusing on data and infrastructure, regulation and society, human resource development and research, and industry promotion and investment, which consist of representatives from government organizations, private sector, academia, and other relevant stakeholders.

The Electronic Transaction Development Agency (ETDA) has partnered with the National Electronics and Computer Technology Center (NECTEC), a government organization affiliated with NSTDA, to achieve goals outlined in the implementation plan. In November 2022, the ETDA signed a memorandum of understanding with NECTEC, the Ministry of Public Health's Department of Medical Services, and the Department of Health Service Support to kick off the AI governance and adaptation framework, beginning with the medical sector. During the same month, ETDA also launched the AI Governance Clinic (AIGC) in cooperation with local and overseas partners to develop an AI governance framework regarding electronic transactions and serve as a source of human resource and capacity development. Under AIGC, ETDA released AI Governance Guidelines for Executives in August 2023 to serve as a foundational document in promoting good governance, outlining best practices to guide corporate executives as more organizations implement AI systems. Application of the guidelines will be piloted in the medical industry following the signing of a Memorandum of Understanding with Mahidol University.

Talent Development

A 2018 Microsoft-IDC study found approximately 30 percent of jobs in Thailand are expected to become automated, outsourced, or obsolete; however, an equal number of new jobs are expected to emerge given technological developments, highlighting the importance of digital upskilling and reskilling. Under the Digital Economy and Society Development Fund, the Artificial Intelligence Center of Thammasat University (Thammasat AI Center) was established in collaboration between MDES and Thammasat University to advance AI research and development and serve as a knowledge source on AI for the public.

The third strategy under the National AI Strategy and Action Plan focuses on AI talent development through improving AI education and scholarships as well as increased cooperation with foreign researchers and experts. In December 2022, the National AI Committee convened for its augural meeting, leading to the establishment of a central platform to provide AI services and the approval of the Manpower Development Plan to produce at least 13,500 talents annually, ranging from supporting professional development of basic AI skills to AI developers.

Government Initiatives

Prior to the release of Thailand's national AI strategy, the Digital Government Development Agency established a government AI center to serve as a resource for government agencies to utilize AI to improve the efficiency and quality of their services. Under the National AI Strategy and Action Plan (2022-2027), Thailand seeks to promote the development of at least 100 AI-related innovations and promote the use of AI by 600 government agencies. Several government agencies and organizations have already integrated AI tools into their workflows, including the Department of International Trade Promotion (DITP), Electricity Generating Authority of Thailand (EGAT), and Ministry of Finance (MOF). At the local level, pilot AI initiatives have also been introduced for crime mitigation and traffic management.

According to its 2022 annual report, the Bank of Thailand (BOT) is conducting a feasibility study to assess the use of AI and machine learning to detect fraud in the Bank of Thailand Automated High-value Transfer Network (BAHTNET) system, which enables the real-time transfer of high-value funds among financial institutions and organizations.

Recent Developments

The second phase of Thailand's national AI strategy is set to begin in 2024. The National AI Policy and Action Plan Steering Committee is planning to request that the new government allocate a 1 billion baht (US$28.9 million) budget to accelerate the creation of 30,000 AI jobs over the next three years.

In October 2022, the MDES Office of the National Digital Economy and Society Commission (ONDE) released the draft Royal Decree on Artificial Intelligence System Service Business for public comment. The draft royal decree adopts a risk-based approach, prohibiting high-risk AI applications, including those that utilize social scoring or real-time remote biometric identification in public spaces, access sensitive personal information (i.e., age or disabilities), or employ subliminal techniques to covertly influence human behavior. AI system service providers located outside of Thailand will be expected to appoint a local representative and comply with registration requirements outlined under the draft decree. However, the draft royal decree will not apply to providers already under the supervision of specific regulators, including the Bank of Thailand and the Office of the Securities and Exchange Commission, under the presumption that the regulators' standards for ensuring transparency and fairness are not lower than those outlined under the decree.

In August 2023, the ETDA closed a one-month public hearing on the draft Act on Promotion and Support of Artificial Intelligence Innovation in Thailand, which covers AI sandboxes, data sharing, standards, contract standards, and risk assessments. The ETDA will seek to establish an AI certification system to engender greater trust in the quality and safety of AI systems among consumers. Furthermore, the government has set out criteria for conducting risk assessments as outlined in the draft Notification on Guidelines for Setting Criteria and Risk Assessment Methods from the Use of Artificial Intelligence Systems. Based on the public draft act, the ETDA may be granted the authority to designate a list of AI systems that can be strictly surveilled if needed.

VIETNAM

In 2021, Vietnam issued the National Strategy for Artificial Intelligence Research, Development, and Application through 2030 to promote the research, development, and use of AI and enable Vietnam to become a regional leader in AI. The strategy supplements a broader effort to promote the country's digital transformation, which the government believes will provide a strong foundation for Vietnam's development as an AI powerhouse. AI has already begun to be applied in several sectors, including banking, health, and transportation. Vietnam's limited data and computing infrastructure has presented a significant barrier in its effort to nationalize "Artificial Intelligence In Vietnam" technologies. In recent years, the country's AI readiness score has improved. The 2022 Oxford Government AI Readiness report ranked Vietnam 55th globally, up seven places from 2021 when it first surpassed the global average score. By 2030, Vietnam aims to rank in the top 4 regionally and top 50 globally in AI research, development, and application.

National Strategy

Vietnam's national AI strategy outlines various targets in R&D, education, innovation, and AI adoption the government aims to achieve by 2025 and 2030. The AI strategy outlines five priority programs for implementation within the decade and details the organizing and coordinating agencies assigned to support each goal. The strategy details plans to incorporate AI widely into public administration services and national defense and security and upskill workers with the aim of boosting labor productivity and increasing standards of living. By 2030, the government aims to establish three national innovative centers on AI, three national centers for big data and high-performance computing, ten new AI research and training institutions, and 50 open, linked, and connected data sets. The first of these AI international research centers, the Naver AI Centre, was launched at the Hanoi University of Science and Technology (HUST) in 2021. Jointly run by HUST and Naver Group from South Korea, the AI Centre will serve as the place to connect domestic and international AI operators to deploy basic research and to create "Made in Vietnam" core technologies. However, given the broad goals and directives outlined under the strategy, several supporting documents will be needed to enable Vietnam to fully realize its AI ambitions.

Organizational Structure

Vietnam's national AI strategy delegates responsibilities across 19 ministries and government agencies. The Ministry of Information and Communications (MIC) is responsible for developing additional legal and policy frameworks to facilitate electronic transactions, data sharing, and AI testing as well as establishing standards and technical regulations. The Ministry of Science and

Technology (MOST) is also tasked with developing legal documents, with a narrower focus on intellectual property rights related to AI. The national strategy also emphasizes the Ministry of Planning and Investment's (MPI) role in encouraging domestic organizations and foreign investors to invest in the local AI industry. Other ministries and agencies are tasked with responsibilities related to sectors under their purview, including the Ministry of Finance (MOF), Ministry of Industry and Trade (MOIT), and Ministry of Public Security (MPS).

Talent Development

While Vietnam has made a concerted effort to integrate talent development as part of developing the AI ecosystem during the fourth industrial revolution, progress in local talent development and retention remains slow. Only 10 percent of domestic demand is met by the local AI talent pool. According to the World Intellectual Property Organization (WIPO), less than 2,000 Vietnamese study and work in AI-related fields, and less than 300 Vietnamese are AI experts. Currently, about 50 universities and institutes are teaching AI-related majors in Vietnam. Many higher education institutions, including Hanoi University of Science & Technology and Ho Chi Minh City International University, have added new majors such as artificial intelligence and data science and have created vocational programs focused on training digital skills. Given the recent inception of these programs, most established in 2019 or later, the opportunities have not yet translated into a significant boost in the local tech talent supply. Other initiatives include public-private partnerships, scholarships, and longer-term AI training programs.

Government Initiatives

MOST has also partnered with the Australian Embassy in Vietnam through the Aus4Innovation program, which has enhanced partnerships between Vietnamese and Australian institutions, sponsored capacity-building activities, and provided technical assistance to MOST's AI research efforts. Vietnam's high-tech application projects in e-commerce, fintech, and AI have secured nearly US$1 million in funding through the Aus4Innovation program. The ministry has also annually sponsored the Vietnam National AI Day (AI4VN) since 2018, and the Vietnam AI Grand Challenge focused on developing and commercializing AI solutions which began in 2019. MOST is also committed to collaborating with MPI to support Vietnam's AI communities in digital technology R&D. Furthermore, the ministry stated that it had set all favorable conditions to attract domestic and international investment in Artificial Intelligence In Vietnam. These include tax incentives and preferential credit terms for science and technology firms.

The Vietnamese government has invested in attracting investment capital into Vietnamese AI startups. In 2022, MOST and Intracom Group launched a public-private partnership model to develop the national startup and innovation complex. The government has also concretized the support for the AI startup community by establishing institutions such as the National Technology Innovation Fund (NATIF), the National Agency for Technology Entrepreneurship and Commercialization Development (NATECD), the National Startup Support Center (NSSC) under MOST, the Vietnam National Innovation Center under MPI, and the National Association of Entrepreneurship (NIC).

In May 2023, the People's Committee of Ho Chi Minh City approved a 10-year AI program to develop AI applications for HCMC over the 2020-2030 period. HCMC intends to establish an e-portal for AI solutions and execute a project for the development of human resources for AI. In August 2022, the city began piloting AI technology to supervise as well as handle complaints and suggestions in real time. The city also plans to pilot AI technology for the urban railway supervision system, forecasting passenger demand, analyzing traffic behavior, and forecasting the possibility of disease transmission.

Recent Developments

In June 2023, a two-month public comment period on the draft National Standard on Artificial Intelligence and Big Data ended. The draft standard seeks to encourage quality assurance and greater transparency throughout the AI module lifecycle. However, the draft standard will be unable to come into full effect without the development of related implementing rules and regulations, which have not been announced.