Google

An AI Opportunity Agenda for ASEAN

Table of Contents

Executive Summary

Artificial Intelligence (AI) has the potential to radically transform the Association of Southeast Asian Nations (ASEAN)'s future, changing the ways people live, work, and learn across all sectors. Through its capacity to assist, complement, empower, and inspire, AI's ability to tackle problems at scale offers new ways to address some of ASEAN's most pressing and complex economic and societal challenges — from solving major public health problems and strengthening disaster resilience, to raising ASEAN's economic competitiveness.

Consider agriculture – a key economic sector for many ASEAN member states (AMS) and a major contributor to GDP, employment, and export earnings. Improving productivity in the agricultural sector means boosting overall ASEAN economic growth. But this has been a longstanding challenge, with rice production in ASEAN at risk of yield stagnation for example. Exacerbated by climate change and changing weather patterns, declining agricultural productivity has broader implications beyond economic growth — critically, it also impacts ASEAN's food security, since rice is the main staple consumed across the region.

AI can play a helpful, transformative role. Headquartered in the Philippines, the International Rice Research Institute (IRRI) – one of Google.org's AI for the Global Goals grantees, is using AI to identify ways to better utilize the world's largest, most diverse collection of rice seeds. With data-backed insights, they're developing climate-resilient rice varieties that will better equip farmers, including farmers in ASEAN, to adapt to climate change.

Flood forecasting is another great example of AI's ability to improve ASEAN's resilience and preparedness. Flooding is the most common disaster event in ASEAN, impacting millions of people each year, particularly AMS in the Mekong Delta. AI-powered flood forecasting tools enable timely preparatory action for riverine floods by providing locally relevant flood data and forecasts up to 7 days in advance.

The economic dividends are also significant. Initial studies have projected that at least IDR 2,612 trillion (or USD 167 billion) in economic benefits can be enjoyed by Indonesian businesses in 2030 if AI tools are used, equivalent to close to 13% of Indonesia's GDP in 2022. In Thailand, the projected economic benefit is THB 2.6 trillion (or USD 783 billion) in 2030, or 15% of Thailand's GDP in 2022.

With a young, tech-positive population, a dynamic digital landscape, and a burgeoning tech ecosystem, ASEAN is well-positioned to harness AI to unlock a multitude of new opportunities.

But this is not a given. The choices made by AMS, industry and civil society now will shape ASEAN's ability to realize AI's promise. We offer three key recommendations on how AMS individually, and collectively at the regional level, can harness AI responsibly and to its fullest potential:

Invest in Innovation Infrastructure

At the national level:

- Invest in research and development (R&D) and AI infrastructure, including cloud infrastructure and open government datasets, which can be used to facilitate innovation that addresses local needs.

- Given the cross-cutting nature of AI, build an interagency apparatus to formulate national AI strategy and frameworks. It is especially important to avoid siloed approaches so that the multiple equities and interests within a government such as privacy, cybersecurity, economic growth, trade, law enforcement, health, and finance are effectively represented and balanced, to advance the ultimate objective of harnessing trustworthy AI for everyone's benefit.

- Establish national legal and policy frameworks/principles that enable responsible innovation, including copyright frameworks that support innovation and creativity, privacy and security by design principles, and risk-based approaches to AI regulation.

At the ASEAN level:

- Ensure that AI is central to the ASEAN Community's Post-2025 Vision, including by establishing "AI for ASEAN" as a new ASEAN cross-sectoral pillar/initiative. AI does not sit neatly within any of the three existing ASEAN communities — its vast implications and applications span across the Political-Security, Economic and Socio-Cultural communities.

- Create ASEAN-wide AI infrastructure such as shared compute and open datasets, including datasets on ASEAN languages and cultural knowledge.

- Establish ASEAN-wide exchange fellowships on AI to spur the development of ASEAN AI expertise and talent.

- Foster regional coherence and consistency on a pro-innovation AI approach through the ASEAN Guide on AI Governance and Ethics and subsequent workstreams.

- Ensure strong digital trade rules in the ASEAN Digital Economy Framework Agreement, which will facilitate trusted cross-border data flows essential for responsible AI development.

Build an AI-ready workforce

At the national level:

- Modernize skilling programs for the AI era by treating AI as a core component of education and professional development systems.

- Develop national AI training and support programs to give workers hands-on experience in applying AI.

- Support workers in transition through comprehensive cross-sectoral skilling and certificate programs, as well as through national AI adjustment assistance programs.

At the ASEAN level:

- Develop a comprehensive ASEAN AI skilling roadmap, with training and support programs for different constituencies including students/youth, micro, small and medium-sized enterprises (MSME), workers, etc.

- Work with Dialogue Partners and industry to exchange, design and scale best practices in AI skilling.

Promote Inclusive Adoption and Accessibility

At the national level:

- Conduct national AI opportunity assessments for public services and leverage AI for public service delivery, particularly in sectors that most immediately impact citizens such as health, education and transportation. This will help familiarize citizens with the underlying technologies, build trust that AI can be used in helpful ways, and model a forward-looking approach for the private sector, including MSMEs.

- Identify priority national sectors that have the highest need and/or lowest uptake of AI tools, and work with them on "proof of concept" initiatives to model effective AI deployment.

- Adopt cloud-first standards to promote AI uptake and transparent procurement rules that encourage fair competition.

- Give traditional industries and MSMEs an "AI jumpstart" through targeted AI training, technical assistance and improved access to capital.

- Adopt proportionate, risk-based regulation which enables broad adoption and deployment of AI by MSMEs.

At the ASEAN level:

- Adopt and promote the use of common technical standards, so that where a business is required to show its compliance with a regulation, it can do so by showing adherence to a common standard. This will be particularly helpful in reducing the compliance burden for MSMEs across ASEAN.

- Ensure that AI adoption and skilling is a strategic goal and a core part of the work program of the ASEAN Coordinating Committee on MSMEs (ACCMSME).

Introduction

We stand at a pivotal moment in the development of AI. The choices made by governments, industry, and civil society at early stages of technological development will determine if it will be adopted at scale and unlock opportunities for all.

AI has the potential to fundamentally change the ways we live, work, and learn, through its ability to assist, complement, empower, and inspire people in almost every field of human endeavor. It is already opening up new possibilities by enabling people to communicate across languages and abilities, helping people stay safe with fire and flood forecasting, reducing energy emissions, and improving our ability to detect and treat cancer and other diseases.

Take AlphaFold, Google DeepMind's AI system that uncovered the 3D structure of 200 million proteins – the building blocks of life. That single initiative is accelerating research in nearly every field of biology, speeding up progress on important real-world problems including finding new drugs to treat liver cancer, developing fully effective malaria vaccines and breaking down single-use plastics. The development of the world's first human pangenome reference – a resource that better represents human genetic diversity – will open doors to more inclusive and equitable genetic testing and treatment globally, enabling more accurate diagnoses and development of new therapeutics.

We believe AI can do so much more to help address some of the defining challenges of our time. The possibilities are immense: from addressing major public health challenges to boosting living standards and re-invigorating economies struggling from a lack of productivity growth.

Together we must ensure that AI makes lives easier, helps solve complex challenges, and enables us to reach big goals. To date, there has been a strong and appropriate focus on addressing potential future risks from AI. We have seen governments take important steps together with companies and other civil society stakeholders to address and mitigate these risks.

But to fully harness AI's transformative potential for the economy, for health, for the climate, and for human flourishing, we need a broader discussion about steps that governments, companies, and civil society can take to realize AI's promise. We must focus not only on the harms we want to avoid and the risks we want to mitigate, but on the potential we want to achieve.

Building on Google's three-pillar agenda for responsible AI progress – unlocking **opportunity**, promoting **responsibility**, and enhancing **security** — this paper proposes three key recommendations for ASEAN policymakers, companies, and civil society to deliver AI's benefits to as broad a range of people as possible. To achieve this, we must work in partnership to: **1) Invest in innovation infrastructure; 2) Build an AI-ready workforce; and 3) Promote inclusive adoption and accessibility.**

ASEAN's AI Opportunity

With a young, tech-positive population, a dynamic digital landscape, and a burgeoning tech ecosystem, ASEAN is well-positioned to harness the AI opportunity. If done right, AI has the potential to revolutionize every sector in ASEAN, propelling economic growth and transformation, lifting living standards and addressing major societal challenges such as health and climate.

From climate and agriculture to healthcare and retail, AI is already enabling ASEAN member states (AMS) in tangible and immediate ways.

Forecasting floods

Natural disasters, like flooding, are increasing in frequency and intensity due to climate change, threatening people's safety and livelihood. Flooding is the most common disaster event in ASEAN, with 13% of ASEAN's population and over USD 900 billion exposed in 2020.

Google Research has developed AI models to forecast floods in 80 countries, including AMS most exposed to flood risk such as **Cambodia, Laos, Myanmar, Thailand and Vietnam.** AMS can use Google's Flood Hub platform to take timely action and prepare for riverine floods, seeing locally relevant flood data and forecasts up to 7 days in advance. Forecasts are updated daily, and all information is free of charge, publicly available, and can be shared over social networks. Such AI tools also complement the ASEAN Framework on Anticipatory Action in Disaster Management.

Boosting operational and retail productivity

Increasing labor productivity is key to raising GDP and driving economic growth. Between 1971 and 2018, labor productivity in ASEAN grew by 2.96% annually. AI can help to supercharge this by orders of magnitude, if adopted broadly and uniformly across ASEAN. It is already helping to transform business and production methods, and making traditionally labor-intensive operations more efficient and effective in some ASEAN businesses.

One example is **SM Supermalls**' usage of AI to improve its operational efficiency in the **Philippines**. SM Supermalls' in-house portal for tenants to submit tax forms was time-consuming, and prone to human error. With Document AI and Google Cloud, an AI-powered portal was created to enable digital tax form submission and automate the process of tenants submitting key tax forms to the authorities, with an increase in accuracy from AI in interpreting input. This reduced submission times by 67%, and lowered the cost and workload for SM Supermalls' tenants and its internal accounting team.

FairPrice – **Singapore**'s leading supermarket chain – is using AI to support its mission of bringing about social impact and fulfilling its role as a key national stockpile agent. AI is used to improve business operations by forecasting workload and manpower needs to ensure optimal staffing at each store, as well as pre-empting supply chain disruptions, such as the Suez Canal blockage in 2021. Working with Google Cloud and BCG consultants, FairPrice is planning to use Generative AI to predict and identify food products close to expiry, which could then be marked down for consumers or the cooked food sellers under its affiliates, to reduce food wastage.

Keeping children safe on the roads

Road traffic crashes are the leading cause of death among children and young people worldwide. The combination of poor road design and vehicle speeds puts children at risk on their daily journeys to school. According to the World Health Organization (WHO), this challenge is particularly acute in Southeast Asia, with the region registering the highest number of fatalities in 2021, or 28% of the global burden.

With funding support from Google's philanthropic arm, Google.org, International Road Assessment Program is using AI and satellite imagery and street-view images to detect road safety risks to provide a country-wide star-rating evaluation of road infrastructure around schools in Vietnam, with potential to scale to other countries. By making this data more accessible, they aim to inform new policies and investment in pedestrian-friendly roads that will minimize preventable harm.

Boosting the agriculture sector

Agriculture is a key economic sector for many AMS, as a contributor to GDP, employment as well as export earnings. In Cambodia and Myanmar, agriculture contributes over 22% of GDP. More than one in every four jobs in Indonesia, the Philippines, Thailand and Vietnam come from the agriculture sector. Agriculture is also a key driver of export growth for Indonesia, Laos, Malaysia, Myanmar, the Philippines, Thailand and Vietnam.

Improving productivity in the agriculture sector is therefore critical to boosting economic growth in ASEAN. But productivity growth has been a longstanding challenge in the agricultural sector. In particular, rice production in ASEAN is at risk of yield stagnation, which is concerning given that rice is the main staple consumed across ASEAN. This has been exacerbated by climate change and changing weather patterns, with broader implications for ASEAN's food security.

AI can play a helpful role. Headquartered in the Philippines, the International Rice Research Institute (IRRI) – one of Google.org's AI for the Global Goals grantees, is using AI to identify ways to better utilize the world's largest, most diverse collection of rice seeds. With data-backed insights, they're developing climate-resilient rice varieties that will better equip farmers, including farmers in ASEAN, to adapt to climate change. Economists from the IRRI project that the benefit of farmers in Asia and Africa adopting new varieties is enormous: an estimated $30 billion after five years.

Delivering better health outcomes

One of the most common chronic diseases in ASEAN is diabetes. According to the WHO, more than 96 million people in the region are estimated to have diabetes, and another 96 million are pre-diabetic. This also means a growing problem with diabetic retinopathy, a condition where diabetes creates lesions in the back of the retina that can lead to total blindness. The good news is that permanent vision loss is not inevitable. With early detection and treatment, blindness can be prevented. But conducting screening at scale is a challenge, as it is severely limited by the number of trained eye specialists to conduct screening programs.

Google's Automated Retinal Disease Assessment (ARDA) uses AI to help healthcare workers detect diabetic retinopathy at scale. Google worked with a large team of ophthalmologists who helped us train the AI model by manually reviewing more than 100,000 de-identified retinal scans. This led to the development of ARDA, which is helping doctors expand high-quality diabetic retinopathy screening programs in countries without enough eye specialists, such as India and Thailand. Google is currently partnering with the **Rajavithi Hospital and the Department of Medical Services, under the Ministry of Public Health in Thailand**, to pilot ARDA.

Cutting down on traffic and travel emissions

Traffic congestion is a common challenge across most AMS, affecting productivity, air quality, and quality of life. Urban greenhouse gas emissions are especially problematic at city intersections where pollution can be 29 times higher than on open roads. About half of the emissions at intersections comes from traffic stopping and starting, a challenge which can be mitigated by leveraging AI to optimize traffic lights.

Green Light, a Google Research initiative, uses AI and Google Maps driving trends to model traffic patterns and make recommendations for optimizing existing traffic light plans. City engineers can implement these in as little as 5 minutes, using existing infrastructure. By optimizing not just one intersection, but coordinating across several adjacent intersections to create waves of green lights, cities can improve traffic flow and further reduce stop-and-go emissions. Early numbers indicate a potential for up to 30% reduction in stops and up to 10% reduction in emissions at intersections. Within ASEAN, Green Light is live in **Jakarta and Bali, Indonesia** and we aim to expand to more locations soon.

An Affirmative AI Policy Vision for ASEAN

The examples above only scratch the surface of what's possible. There is potential for AI to do so much more for ASEAN, significantly improving the lives of everyone in the region. But as we've learned from prior waves of technology, these benefits are not automatic. Unless people trust and see the benefit in using the technology, it will not be adopted at scale.

The upcoming ASEAN Guide on AI Governance and Ethics can lay the foundation for ASEAN's AI future by putting forward an approach to AI governance that builds trust and promotes responsibility, while enabling innovation and adoption. If ASEAN wants to fully harness AI's transformative potential, it must focus its attention on what it wants to achieve, not just what it wants to avoid.

In this light, we offer **three key recommendations on how AMS – individually and at the ASEAN level — can harness AI responsibly and to its fullest potential:**

Invest in Innovation Infrastructure – meeting the moment of this technology by investing in AI research and development, cloud infrastructure, compute capacity, and open government data sets; and establishing national and regional policy frameworks/principles that enable responsible innovation.

Build an AI-ready workforce – investing in people to make sure they can use and benefit from AI, from students to workers, and from small businesses to traditional industries.

Promote Inclusive Adoption and Accessibility – harnessing AI across governments and all sectors of the society to address major societal and economic challenges and ensure the benefits of AI are widely shared, while adopting a regulatory framework that supports a healthy AI ecosystem.

All of the above will require collaboration and deep engagement across AMS, industry and civil society. No single nation, no single industry, and no single company or organization will be able to build the AI future on their own. We will only succeed together.

Investing in Innovation Infrastructure

Countries have historically excelled when they support technological change and harness it to improve living standards. ASEAN's openness to technological development and adoption positions it well in this regard. But unlocking the immense AI opportunity will require sound and deliberate investment in innovation infrastructure, which includes not just technical infrastructure but also legal and policy frameworks at the national and regional levels that enable responsible AI innovation.

Investing in R&D and AI Infrastructure

AMS can support scientific and technological competitiveness by investing in long-term R&D and standing up new public-private approaches to build out AI infrastructure. Policymakers should tailor these efforts to make AI tools accessible to as many entrepreneurs and scientists as possible, allowing more developers to propel AI technology itself and to leverage AI to accelerate discoveries in other fields. We will also require new strategies to reach the remaining 28% of ASEAN's population which still does not have access to internet services, to ensure AI is truly accessible.

There is no one AI investment strategy that will work for all governments, but one basic formula for success is to **invest in basic and applied research and technologies (such as graphics processing units and supercomputers), cloud infrastructure, and open government datasets** – and then to put in place policies encouraging private sector innovation and product development that are built on top of these foundational initiatives. Such a model can drive innovation leadership by creating a sense of shared responsibility between the public and private sectors for developing AI and other emerging technologies.

Within ASEAN, Singapore has highlighted in its National AI Strategy 2.0 its intention to invest in compute infrastructure, and to enable access to compute in support of meritorious use cases for capability building, innovation, and the Public Good. The Philippines' National AI Roadmap recommends the establishment of the National Center for AI Research (N-CAIR) as a shared research hub which will support Filipino businesses including MSMEs, in adopting AI technology. Indonesia's National Strategy on AI 2020-2045 recommends the establishment of the National AI Super Computer Center (INAISCC), which will serve as a hub for research centers, industries and government agencies in need of large compute services.

In addition to these national efforts, AMS could consider **creating ASEAN-wide AI infrastructure** so that AI development and research opportunities can flourish throughout the region. This could include facilitating access to shared compute and open datasets, including on ASEAN languages and cultural knowledge. This will help ASEAN researchers and companies develop innovative AI products and services that address local and regional needs. **ASEAN-wide AI exchange fellowships** could also be established to spur the exchange and development of ASEAN AI expertise.

AMS could also support the establishment of a **Global Resource for AI Research (GRAIR)** to enable AI research globally. The GRAIR would help create a "global commons" of data, resources, and infrastructure to support AI development globally. For instance, it could drive the creation of open data sets related to low-resource languages and cultural knowledge, to ensure greater diversity and accuracy for non-Western languages and culture. Beyond providing technical resources, the GRAIR should also provide support for countries at different levels of development to build up domestic AI workforce capabilities, including application developers and researchers.

Public-private partnerships may be effective in accelerating research and creating shared resources across the AI ecosystem. Both governments and industry can help support academic and civil society researchers through programs such as tech transfer frameworks, fellowships, and direct support for research. Public-private initiatives to support the creation of impactful AI use cases for businesses should also be encouraged, with the AI Trailblazers initiative between Google Cloud and the Singapore Government as a positive model. These efforts must also broaden the range of participants beyond the usual suspects in academia and industry, to reflect the geographic, linguistic and cultural diversity of national and global communities.

AI Trailblazers

AI Trailblazers is a joint initiative between Google Cloud, Singapore's Ministry of Communications and Information (MCI), Digital Industry Singapore (DISG), and Smart Nation and Digital Government Office (SNDGO) to accelerate the development of impactful Generative AI solutions in Singapore.

Under the AI Trailblazers initiative, two Innovation Sandboxes have been established to provide up to 100 organizations in Singapore with seamless access to Google Cloud's high-performance graphics processing units (GPUs), Vertex AI platform, pre-trained generative AI models, and low-cost developer tools, at no cost for up to three months. With access to these comprehensive, custom-built, and easy-to-use generative AI toolsets, organizations can build and test their own generative AI solutions in a controlled and dedicated cloud-based environment. The goal is to identify and address 100 generative AI use cases across government and industry within 100 days.

Pro-Innovation Legal and Policy Frameworks

AI is too important not to regulate – and too important not to regulate well. At this moment, the challenge faced by all policymakers is **how to govern AI in a way that mitigates risks and potential harms without impeding beneficial innovation**. There is a risk that conflicting and fragmented regulatory approaches will block innovators and governments around the world from harnessing trustworthy and beneficial AI applications to achieve strengthened economies, find cures for cancer, and ensure longer, better lives for billions of people.

Several AMS have come up with policy frameworks on AI governance, including Indonesia's Circular Letter on Ethical Guidelines for the use of AI and Singapore's Model AI Governance Framework. **At the ASEAN level, the ASEAN Guide on AI Governance and Ethics can help to establish regional coherence and consistency as AMS develop their national AI governance frameworks.**

But as we improve our collective capacity across industry and governments to address AI risks, we must also turn to the comparably important challenge of building and optimizing policy frameworks that unleash new opportunities from AI.

We believe there are four major universal policies that policymakers in ASEAN should consider to ensure AI researchers and innovators can convert ideas and data into new discoveries, products, and services.

First, AMS should build an interagency apparatus to avoid siloed approaches to national AI regulation. While we need case-specific answers for the unique issues of each sector, it will often be true that a regulatory debate on an issue like data will implicate multiple equities and interests within a government – agencies responsible for privacy, cybersecurity, economic growth, trade, law enforcement, health, and finance all may have a reason to weigh in on the issue. AMS need to build an interagency apparatus that can effectively represent and balance these competing equities – leaving a critical element of AI policy to one agency, without weighing trade-offs, risks an overall AI strategy that is misaligned with the public's broader interests.

At the regional level, ASEAN should ensure that AI is central to the ASEAN Community's Post-2025 Vision, including by establishing "AI for ASEAN" as a new ASEAN cross-sectoral pillar/initiative. AI is a cross-cutting issue which has implications, applications and dependencies across multiple areas, including national security, trade, privacy, copyright, health, labor, and the environment. This also means it does not sit neatly within any of the three existing ASEAN Communities. A new cross-sectoral pillar/initiative focused on AI — AI for ASEAN — should be established to ensure that regional AI discussions and initiatives are not undertaken in a siloed manner, and that strong efforts are made to explore and scale AI solutions across all sectors.

Second, establish copyright frameworks that support innovation and creativity – including limitations and exceptions that allow developers to train AI models on publicly available data. An AI-innovation friendly copyright framework is one strong predictor of whether a country will be a leader on AI. For AI systems to learn from and engage with diverse information sources and datasets, copyright frameworks must allow for broad usage of data inputs. And for copyright frameworks to achieve these goals, governments must ensure that users, scientists, innovators, researchers, and creators using these tools are fully represented within the policymaking process. Within ASEAN, Singapore updated its Copyright Act in 2021 to include a computational data analysis exception, which supports Singapore's national AI aspirations by providing legal certainty for AI researchers, innovators and companies.

Third, adopt a risk-based approach to AI regulation. This is crucial to provide clarity to developers, deployers, and regulatory agencies about which uses are disallowed, and to encourage alignment around addressing the most severe concerns related to AI. A risk-based approach also allows regulators to identify which parties (developers, deployers, or users) are most likely to have control over harm prevention and mitigation and therefore should be held accountable.

Fourth, policymakers should encourage privacy and security by design principles so that individuals' personal data is safeguarded, they are given appropriate notice and controls related to their personal data, and the outputs of AI systems protect individual privacy. At the same time, privacy frameworks should continue to preserve the ability to process publicly available data, while supporting privacy preserving technologies throughout AI systems.

Beyond these substantive areas, AMS should also seek to obtain a clear view of the *existing* regulatory landscape within their jurisdictions by undertaking holistic audits of regulations relevant to AI across the ecosystem. Such a survey will be helpful to identify both regulatory gaps and areas of overlap or inconsistency that can impede innovation.

Strong Trade and Investment Policies

Given the cross-border nature of AI, enabling trade and investment frameworks will be essential for the development, deployment, and governance of AI.

One of the most meaningful steps that AMS can take to support responsible AI is by committing to support trusted cross-border data flows. Data flows enhance the capability of partners to work together to ensure AI systems are trained on demographically and geographically diverse datasets, which helps mitigate potential bias in these systems and makes them more useful and relevant to users around the world.

Digital trade commitments that reflect countries' support for trusted cross-border data flows give much-needed certainty and enable the development of responsible AI. Four AMS — Brunei Darussalam, Malaysia, Singapore and Vietnam — have committed to enabling cross-border data flows through the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Singapore has also signed digital economy agreements with Australia, the UK and South Korea, as well as the Digital Economy Partnership Agreement (DEPA) with Chile and New Zealand, which contain similarly strong commitments on cross-border data flows.

Through the ASEAN Digital Economy Framework Agreement (DEFA), ASEAN has the opportunity to put in place enabling trade rules and mechanisms to support AI innovation and adoption and to enhance regional interoperability. These include strong rules on the free and trusted flow of data, promoting regulatory interoperability and least-trade-restrictive regulation, and non-discrimination. DEFA should also promote new trade principles such as responsible and ethical standards governing the use of AI and emerging technologies.

The strategic importance of AI should also drive renewed attention to investment strategies, particularly when it comes to building transcontinental AI infrastructure and subsea cables through initiatives like the [Partnership for Global Infrastructure and Investment](). Such initiatives can encourage greater public and private investment in technical infrastructure by conditioning investment on the creation of a stable and predictable policy environment.

Recommendations

At the national level:

- Invest in R&D and AI infrastructure, including cloud infrastructure and open government datasets which can be used to facilitate innovation that addresses local needs.

- Given the cross-cutting nature of AI, build an interagency apparatus to formulate national AI strategy and frameworks. It is especially important to avoid siloed approaches so that the multiple equities and interests within a government such as privacy, cybersecurity, economic growth, trade, law enforcement, health, and finance are effectively represented and balanced, to advance the ultimate objective of harnessing trustworthy AI for everyone's benefit.

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- Establish ASEAN-wide exchange fellowships on AI to spur the development of ASEAN AI expertise and talent.

- Foster regional coherence and consistency on a pro-innovation AI approach through the ASEAN Guide on AI Governance and Ethics and subsequent workstreams.

- Facilitate trusted cross-border data flows essential for responsible AI development through strong digital trade rules in the ASEAN Digital Economy Framework Agreement.

Building an AI-ready Workforce

AI presents immense opportunities to catapult ASEAN forward through increased productivity and economic activity that can benefit everyone. Recent studies have projected that at least IDR 2,612 trillion (USD 167 billion) in economic benefits can be enjoyed by Indonesian businesses in 2030 if AI tools are utilized, equivalent to close to 13% of Indonesia's GDP in 2022. In Thailand, the projected economic benefit is THB 2.6 trillion (USD 73 billion) in 2030, or 15% of Thailand's GDP in 2022.

But AI can also be a disruptive force, and it will present unique challenges compared to prior waves of technology, requiring new solutions. Given these dual possibilities, the question becomes: **how can AMS equip the workforce to harness AI** – so that it empowers workers, helps them become more productive, bumps up their expertise level, and makes their skills more valuable? And how can we mitigate any potential risks to the workforce through partnerships between governments, industry, and civil society?

Building an AI-empowered workforce will require a shared vision – and a shared responsibility – across three sets of stakeholders:

Industry has a critical role to play in **developing new skilling programs** that focus on AI preparedness. Google Cloud has introduced free courses on Generative AI available in all AMS, and we are continuing to update our career certificate programs to focus on AI preparedness. But given the transformative impact of AI across all sectors of the economy, individual company efforts would be insufficient on their own – companies will need to stand up new **cross-sectoral AI training partnerships** to ensure workers in all industries are ready to harness AI.

Civil society, foundations, and academics should drive new research to understand what has and hasn't worked in the past in terms of worker preparedness for new technologies, and then apply those insights to **ensure lower-wage workers and rural or underserved communities** are at the center of AI workforce programs. Google.org is committed to supporting this research globally through the Digital Futures Project and applying these insights to prepare the workforce for the AI-enabled jobs of the future. **With funding from the Digital Futures Project, AI Singapore is embarking on policy research focused on AI in ASEAN.**

And most importantly, **policymakers** must help **scale up AI training programs** so that they reach all communities, while building more effective "trampolines" - to catch workers that are impacted by AI and reskill them so they can quickly bounce back into new and better jobs. Google's partnerships with the governments of Malaysia, Singapore and Thailand are good examples of public-private efforts to boost digital and AI skills at scale.

The goal across all of these efforts will be to ensure that AI democratizes access to skills and expertise and **creates a ladder of opportunity** for workers from all backgrounds.

Modernizing Skilling Programs for the AI Era

To tailor policy interventions, it will be important to understand how AI is both similar to and different from prior waves of technology. Early research indicates that generative AI may help up-level certain skills, enhance labor productivity, create new occupations, and democratize access to higher paid occupations. But because generative AI can automate non-routine cognitive tasks, it may impact a wider range of tasks and occupations than earlier technologies.

We are still in the process of understanding what kinds of new skills AI-enabled work will require. There are some things we already know – such as the importance of workers having basic AI literacy and how eminently human talents like critical thinking, cross-disciplinary problem-solving, effective collaboration, and empathy are likely to increase in value. Industry and governments must adjust existing skilling programs to address those considerations. But there are other open questions about AI's impact on work that will need further study, such as how AI can be best used to support re-skilling, and how to minimize the risk of "skill atrophy" as routine tasks that previously provided training opportunities for novice employees are increasingly automated. AMS, companies, and civil society will need to constantly evolve skilling programs to address these questions and manage these transitions.

Education and workforce training programs will become all the more important to help workers and learners apply AI to meet their own goals. We need an education and training system that prepares workers to thrive in a dynamic environment and to augment their existing skills and talents with AI. This must extend beyond the secondary education system – we need a lifelong approach to learning that equips all students and workers with foundational AI skills throughout their careers.

This also means treating AI as a core component of our education and professional development systems. We must support educators to update curriculum frameworks, double down on STEM education with an emphasis on AI literacy (while avoiding narrow recommendations like 'learn to code' that may be less relevant if generative AI can cover basic coding skills), and emphasize skills-based learning models, including apprenticeship programs.

Educators themselves first need to be equipped with AI proficiency, including how to use AI safely and responsibly. This can be done in partnership with industry, such as Bard Academy which Google has launched in Indonesia and Thailand. Equipping educators with AI skills will enable them to leverage AI in the classroom to transform how students learn, providing targeted interventions based on the individual needs and capabilities of different learners.

Skilling programs will become even more essential, but we need to recognize that the way we work is changing. In a wide variety of occupations, about one-third of tasks will be augmented by AI – meaning that people will need to find new ways to do their jobs in collaboration with AI. To thrive in the AI era, it will be critical for workers to build a more durable skillset of broader and more fundamental competencies. That requires updating and adapting skilling programs across sectors, and building up new public-private partnerships to scale up these programs to reach all workers. AMS should encourage companies that have developed career certificate and apprenticeship programs to work across sectors to develop more comprehensive cross-sectoral skilling and certificate programs that reflect the full spectrum of skills needed for an AI-driven future.

Bard Academy

Bard Academy is an outreach program launched by Google to train teachers on AI proficiency, and how to use Bard and AI safely and responsibly. Bard Academy has been launched in Indonesia and Thailand, and has trained over 2,000 and 5,000 K-12 teachers respectively. We are planning to expand Bard Academy to more ASEAN markets.

At the ASEAN level, AMS should develop a comprehensive ASEAN AI skilling roadmap, with training and support programs for different constituencies, including students/youth, MSMEs, and workers. This can be done in partnership with Dialogue Partners and industry, so that these skilling programs are designed in line with best-practices, scaled and implemented across ASEAN.

Supporting Workers in Transition

AI is already helping to democratize access to skills and expertise such as coding, language and writing skills, and promises to enable more individuals to use productivity strategies that were once exclusively available to workers at the top of the income ladder. By creating more opportunities for more people, AI can help nurses, contractors, teachers, and people in the trades increase their capabilities, supercharge their productivity, and have another arrow in their quiver to get higher pay and better working conditions.

But as we know from history, it's not inevitable that all workers will realize the economic benefits from new technologies. We need strategies for helping workers who are impacted by technologies, and we need to modernize past programs like trade adjustment assistance, which have been insufficient to prepare displaced workers for the occupations of the future. It is also important to recognize that AI programs must be tailored not only to job seekers, but to all workers who will need essential AI productivity skills.

AMS should consider developing national AI adjustment assistance programs to provide support for workers impacted by AI, with a tailored set of skilling options that can adapt to different worker needs in different geographies, and a focus on lower-wage workers and rural or underserved communities.

Recommendations

At the national level:

- Modernize skilling programs for the AI era by treating AI as a core component of education and professional development systems.

- Develop national AI training and support programs to give workers hands-on experience in applying AI.

- Support workers in transition through comprehensive cross-sectoral skilling and certificate programs, as well as through national AI adjustment assistance programs.

At the ASEAN level:

- Develop a comprehensive ASEAN AI skilling roadmap, with training and support programs for different constituencies including students/youth, MSMEs, workers, etc.

- Work with Dialogue Partners and industry to exchange, design and scale best practices in AI skilling.

Promoting Inclusive Adoption and Accessibility

In addition to building AI and preparing students and workers, we ultimately need to ensure that AI is applied and deployed in a universally accessible and useful way. We must harness AI to help solve real-world problems – in government buildings, in hospitals, and at kitchen tables. To do this, we have identified three key goals: (1) adopt AI to make people's lives easier and better and address major public priorities; (2) ensure that small businesses and traditional industries are able to adopt AI applications; and (3) regulate AI applications in a way that facilitates their adoption across different industries.

Governmental Adoption of AI

AMS and the publics they serve stand to gain from adopting AI in two ways. First, AMS can leverage AI to improve the delivery of services to citizens, which has the additional benefit of familiarizing people with the underlying technologies and building trust that AI can be used in helpful ways. Second, by adopting AI, AMS can model a forward-looking approach for their domestic technology sector, and help other sectors understand the importance of AI. The scale of government deployment and investment can ultimately help catalyze a domestic AI ecosystem and, by requiring standards for AI system performance, can also help mature the quality and safety of commercial and enterprise AI products.

To identify the most beneficial uses of AI for their citizens, AMS should conduct **national AI opportunity assessments for public services,** particularly in sectors such as health, education, transportation, and other services that most immediately impact people's lives. The first step in such assessments would be to examine existing solutions that are showing promise, such as AI-powered flood forecasting tools already available in Cambodia, Laos, Myanmar, Thailand and Vietnam. Investing in and scaling up these programs could be one of the **best near-term ways to show progress on AI-enabled solutions** and have a huge impact on people.

As governments, industry, and civil society identify new areas of AI opportunity, they should work together to plan and implement AI adoption programs in these sectors, and monitor the performance of AI-augmented services to make continuous improvements. Finally, AMS can work with industry to leverage cloud computing to ensure the efficiency of these services and the security of their AI systems.

AMS should also **identify priority national sectors that have the highest need and/or the lowest uptake of AI tools**, such as the agriculture, manufacturing, healthcare, and energy sectors, and work with these sectors on "proof of concept" initiatives to model effective AI deployment. For example, Singapore's National AI Strategy 2.0 aims to encourage AI innovation in leading economic sectors and smart nation priorities such as healthcare and education.

Efforts should also be made to identify barriers to the deployment of AI in key sectors and industries. Procurement roadblocks are often one of the most significant challenges that governments and industries face when it comes to adopting new technologies like AI. To clear these barriers, AMS should **adopt cloud-first standards to promote the uptake of AI, and adopt transparent procurement rules that encourage fair competition**. Google and the Royal Thai Government recently announced a strategic partnership in which Google Cloud will contribute technology and policy expertise to Thailand's Go Cloud First policy direction. This partnership aims to modernize Thailand's government services and public sector delivery through AI technologies, beginning with public transportation, e-government services and big data usage.

Finally, AMS will need more AI expertise within government to effectively harness AI. Policymakers should **build and scale up "in-house" AI skilling opportunities for the government workforce**; Google took a similar step a few years ago, requiring all software engineers to enroll in an internal machine-learning curriculum. AMS could also consider creative ways to **bring in private-sector talent**, such as AI Fellows modeled on the US' Presidential Innovation Fellows program. Finally, while every agency will need some AI expertise, AMS should consider establishing a centralized resource of experts that can advise agencies across the government.

Helping Traditional Industries and MSMEs Use AI

MSMEs and traditional industries have too often lagged behind their peers in the adoption of innovative technologies. Uplifting ASEAN MSMEs is critical, especially since they make up between 97.2% to 99.9% of total establishments in AMS. AMS and AI developers must work together to develop proactive outreach strategies to traditional industries and MSMEs – who have much to gain in terms of their competitiveness if they are quick to harness and deploy AI. For example, a recent study showed that 91% of small businesses using AI had success in driving revenue, customer outreach and acquisition, or increasing productivity.

AMS should **give traditional industries and MSMEs an "AI jumpstart"** through new models of **technical assistance** and engagement, including digital coaches who can help businesses understand and leverage AI to capitalize on new opportunities. One model could be the Australian government's funding of AI Adopt Centres to help small and medium businesses grow their business through AI. Improving access to capital, including through low-interest loan and grant programs designed to support AI-driven transformation will also be tremendously helpful.

At the ASEAN level, AMS should **ensure that AI becomes a core part of the work program of the ASEAN Coordinating Committee on Micro, Small and Medium Enterprises (ACCMSME)**. This could include working with industry and civil society partners to feature AI skilling programs on existing skilling platforms such as the ASEAN SME Academy, as well as AI training and capacity building for ASEAN MSMEs. As the current ASEAN Strategic Action Plan for SME Development (SAP SMED) will end in 2025, ASEAN should ensure that AI adoption and skilling is featured prominently as a strategic goal in the next SAP SMED.

Enabling Regulation and standards

AMS need to ensure that their regulatory frameworks empower and do not frustrate MSMEs and traditional industries seeking to adopt AI. Regulators should consider what regulation will facilitate the adoption of AI, including adoption by MSMEs with fewer resources. **Any AI regulation should therefore be proportionate, risk-based and focused on applications, recognizing that AI is a general purpose technology.** Regulatory requirements should be calibrated to the particular risk and use case so as to enable broad adoption and deployment of AI by MSMEs.

At the ASEAN level, AMS should **adopt and promote the use of common technical standards**, so that where a business is required to show its compliance with a regulation, it can do so by showing adherence to the regional standard, rather than having to meet a bespoke requirement. This will be particularly helpful in reducing the compliance burden for MSMEs across ASEAN, and to encourage them to boldly innovate.

Recommendations

At the national level:

- Conduct national AI opportunity assessments for public services and leverage AI for public service delivery, particularly in sectors that most immediately impact citizens such as health, education and transportation. This would also help familiarize citizens with the underlying technologies, build trust that AI can be used in helpful ways, and model a forward-looking approach for the private sector, including MSMEs.

- Identify priority national sectors that have the highest need and/or lowest uptake of AI tools, and work with them on "proof of concept" initiatives to model effective AI deployment.

- Adopt cloud-first standards to promote AI uptake and transparent procurement rules that encourage fair competition.

- Give traditional industries and MSMEs an "AI jumpstart" through targeted AI training, technical assistance and improved access to capital.

- Adopt proportionate, risk-based regulation which enables broad adoption and deployment of AI by MSMEs.

At the ASEAN level:

- Adopt and promote the use of common technical standards, so that where a business is required to show its compliance with a regulation, it can do so by showing adherence to the regional standard. This will be particularly helpful in reducing the compliance burden for MSMEs across ASEAN.

- Ensure that AI adoption and skilling is a strategic goal and a core part of the work program of the ASEAN Coordinating Committee on MSMEs (ACCMSME).

Towards an AI Future

As ASEAN looks to seize the AI opportunity, its members have a critical role to play in developing AI policy frameworks both at the national and ASEAN levels which show that safety, security, innovation, and opportunity can go hand-in-hand. We look forward to partnering with ASEAN to build an AI-driven future that benefits everyone.

Learn more at publicpolicy.google