

An Al Opportunity Agenda for Vietnam

04 Executive Summary

06 Introduction

07 Vietnam's Al Opportunity

Enhancing Government Services
Boosting Competitiveness of the Manufacturing Sector
Strengthening the Electric Vehicles (EV) Industry
Making Agriculture More Efficient and Greener
Improving Healthcare
Raising the Level of Education
Keeping Children Safe on the Roads
Forecasting Floods
Detecting Deforestation and Protecting Biodiversity

13 An Affirmative AI Policy Vision for Vietnam

14 Investing in Innovation Infrastructure

Investing in R&D and AI Infrastructure
Investing in AI Research and Development
Strengthening Compute Capacity
Promoting Open Government Datasets
Pro-Innovation Legal Frameworks

19 Building an Al-Ready Workforce

Modernizing Skill Programs for the AI Era Supporting Workers in Transition

25 Promoting Inclusive AI Accessibility and Adoption

Government Adoption of AI
Helping Traditional Industries and Small Businesses Use AI
Enabling Regulation and Standards
Towards an AI Future

Executive Summary

We stand at a pivotal moment in the development of AI. Vietnam is making crucial progress towards mobilizing the power of AI to accelerate economic growth and improve the quality of life of people across the country. Vietnam's National Strategy on R&D and Application of AI outlines Vietnam's ambitions to become a hub for AI innovation in Southeast Asia and globally by 2030. The government has approved a National Data Strategy and is taking steps to promote AI research, development, and application. It is now vital for all stakeholders to build on this progress and come together on a comprehensive AI opportunity agenda to realize AI's full potential for Vietnam.

Digitalization and AI have a key role to play in driving Vietnam's transformation towards a more regionally and globally competitive and diversified economy. The Google-commissioned Economic Impact Report estimated that for 6 Southeast Asian economies including Vietnam, businesses could expect up to USD 835 billion of economic benefits in 2030 if AI-powered products and solutions are adopted. Attracting investment and enabling innovation in AI will be key to achieving Vietnam's target for the digital economy to contribute 30% of its GDP by 2030, rising from about 12% in 2023. If fully harnessed, AI has the potential to help fulfill Vietnam's ambitions of rapid economic developed country by 2045.

The adoption of safe and responsible AI across the Vietnamese economy and society can unlock vital productivity growth, attracting investment and generating employment in high-tech industries and enabling the transition to a greener economy. Ultimately, AI is a central pillar in Vietnam's previously stated ambition to become a "high-income developed country" by 2045.

Vietnam is located in a highly competitive region for manufacturing. Several nearby countries have recently announced initiatives aimed at attracting investment in the context of intensifying geopolitical competition in the wider region. Vietnam is already leveraging AI innovation to maintain and increase its long-term competitiveness as a manufacturing hub, including diversifying away from traditional strengths and expanding production in hi-tech industries like electronics and telecommunications.

Large Vietnamese enterprises such as Viettel, FPT, CMC, VNPT, and Vingroup have invested in innovative AI solutions and products, highlighting the potential of AI to benefit a wide range of Vietnamese businesses.

Al can also help Vietnam to meet the challenges presented by environmental degradation and climate change, particularly flood risk. The Northern Red River Delta, the Central Coast, and the Southern Mekong River Delta - Vietnam's key agricultural hubs - are vulnerable to floods that threaten economic activities and livelihoods. Al-based hydrologic technologies like Google's Flood Hub can significantly improve flood forecasting, helping to mitigate flood risk.

Google is committed to helping Vietnam to realize its ambitions in AI, particularly through supporting Vietnam's human resource development and enabling Vietnam's burgeoning startup economy to maximize AI adoption. By partnering with the Vietnam National Innovation Center (NIC, an agency under the Ministry of Planning and Investment), Google has offered 40,000 Google Career Certificates scholarships across 80 universities and established a local AI-focused, Google for Startups Accelerator program. The Google for Startups Accelerator Southeast Asia - Vietnam, a three-month equity-free program supported by the NIC, aims to accelerate highpotential AI startups based in Vietnam, by connecting them to the best of Google's AI products expert and infrastructure. Startups accepted to the program will gain access to AI infrastructure on Google Cloud, such as Vertex AI and Gemini Pro via the Google Startup AI Space, an online sandbox, to aid the rapid development and prototyping of AI applications.



With a fast-growing digital economy, large, tech-savvy, and young population, and vibrant startup community, Vietnam is well-positioned to capitalize on the opportunity of AI. Realizing the promise of AI will require strengthening the technical infrastructure essential to AI innovation and equipping businesses across the economy with the capabilities and confidence to apply the technology to products that benefit citizens. Trusted and secure cross-border data flows are also a critical enabler of AI innovation. To ensure that Vietnam can harness AI responsibly and to its fullest potential, we propose three key recommendations that should underpin Vietnam's AI opportunity agenda:

- Invest in infrastructure and innovation investing in AI research and development,
 access to and quality of digital infrastructure
 and compute capacity, and providing a
 supportive policy environment that lowers
 barriers to AI innovation.
- Build an Al-ready workforce investing in people to ensure they can use and benefit from Al, from students to workers, and from small businesses to large conglomerates.
- Promote inclusive adoption and accessibility

 harnessing AI across the government and
 all sectors of the economy to address major societal and economic challenges and ensure the benefits of AI are widely shared.



Introduction

The choices made by the government, industry, and academic community at early stages of technological development will determine the speed and scale of adoption and the extent to which all parts of Vietnamese society can benefit.

Al 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.

Consider AlphaFold, Google DeepMind's Al initiative that uncovered the 3D structure of 200 million proteins – the building blocks of life. That single innovation 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 singleuse 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 focus on addressing potential future risks from AI. We have seen governments take important steps together with companies and other non-government organizations to address and mitigate these risks.

But to fully harness Al's transformative potential for the economy, for health, for the climate, and for human flourishing, we need a broader discussion not only on the risks we want to mitigate, but also on the potential we want to achieve.

Building on Google's three-pillar agenda for <u>responsible Al</u> <u>progress</u> – unlocking **opportunity**, promoting **responsibility**, and enhancing **security** — this paper proposes three key recommendations for Vietnamese government, companies, and research institutions to deliver Al's benefits to as broad a range of people as possible. To achieve this, it is important to work in partnership to:

- 1. Invest in innovation infrastructure;
- 2. Build an AI-ready workforce; and
- 3. Promote inclusive adoption and accessibility.



Vietnam's AI Opportunity

With a young, tech-savvy population, a fertile startup ecosystem, and a government focused on digital transformation, Vietnam is well-positioned to further harness the AI opportunity. If done right, AI has the ability to enhance government services and raise the productivity, resilience, well-being, and growth of individuals and enterprises across Vietnam, especially micro, small, and medium enterprises (MSMEs).

It also has a vital role to play in mitigating societal and economic risks, including those relating to climate change and the environment. All these would be aligned with and facilitate the attainment of Vietnam's key development goals, including the economic, environmental, and social targets outlined in its Five-Year National Socio-economic development plan for 2021-2025.

In this regard, AI is already helping to transform Vietnam for the better:1

- **Viettel** developed an Al-enabled Legal <u>Virtual Assistant</u> to help automate aspects of the legal and judicial process.
- **Novas EZ Co.**, a South Korean electronic manufacturing service company, <u>leverages</u> AI to make its Vietnamese factory's production more efficient.
- Al integration into Vietnam's electric vehicle (EV) sector enables advancements in areas such as EV design, the driver experience, and battery production.
- The International Rice Research Institute (IRRI) <u>uses</u> Al to develop climate-resilient rice varieties that will better equip Vietnamese farmers to cope with climate change.
- **Vingroup Big Data Institute** has developed <u>VinDr</u>, an AI-enabled application that helps medical practitioners to accurately diagnose and detect diseases.
- **FPT University** is conducting <u>training programs</u> to help Vietnamese teachers use AI to improve the quality of education.
- The International Road Assessment Program <u>uses</u> At to keep children safe on the roads in Vietnam.
- Google's AI-enabled flood-forecasting platform, <u>Flood Hub</u>, helps Vietnam's agricultural hubs forecast floods.
- The Coffee Vision project <u>uses</u> AI to accurately identify deforestation in Vietnam's coffee production sites to improve biodiversity.



¹ Disclaimer: The report references public information on AI use case examples, although the accuracy of those external sources contained in or linked to this report cannot be fully verified.

Enhancing Government Services

Al has the potential to improve the efficiency and quality of government services in Vietnam. The OECD's Observatory of Public Sector Innovation has <u>found</u> that Al holds great promise for the public sector, uncovering many use cases around the world. In <u>Brazil</u>, for example, an Al-based virtual clerk provides citizens with information on all public services offered by the State Government of Alagoas.

In Vietnam, at both state and local levels, government agencies are actively leveraging AI in their provision of public services. Viettel has developed a Legal <u>Virtual Assistant</u> to help automate aspects of the legal and judicial process. According to Viettel, within just over a year of deployment since June 2022, the Viettel Legal Virtual Assistant has <u>provided</u> convenient access to legal documents, court cases and decisions, and precedents, helping to reduce the workload of judges and civil servants by 30%. In addition, several districts in Ho Chi Minh City have <u>used</u> AI-powered facial recognition to automate the process of verifying and filling in the administrative forms for citizens. AI can help streamline wider areas of government services, delivering improvements to <u>handling traffic violations</u> and <u>managing immigration control</u>.



Over the past decade, manufacturing in Vietnam has excelled at attracting foreign direct investment (FDI), driving the country's high GDP growth. Increasing productivity is key to further boosting Vietnam's competitiveness as both a regional and global manufacturing hub.

AI can help Vietnam to accelerate its rapid growth in manufacturing. The Ministry of Information and Communications (MIC) has <u>outlined</u> that the development of AI tailored for specific manufacturing sectors is a focus in 2024. International manufacturers seeking to establish a presence in Vietnam are increasingly incorporating AI to drive efficiencies in their manufacturing process. Novas EZ Co., a South Korean electronic manufacturing service company, <u>leverages</u> AI in its production sites, which has proven key to a 25% increase in its Vietnamese factory's production volume.







Strengthening the Electric Vehicles (EV) Industry

In Vietnam, production of EVs is <u>predicted</u> to reach 1 million units by 2028 and 3.5 million by 2040, while the market share of EVs in Vietnam could reach 15% by the end of 2024, ranking second in Southeast Asia. Expanding the domestic consumption and use of EV is also key to Vietnam's plan for a greener transport system. Vietnam's <u>Action Program</u> on green energy transformation outlines <u>specific goals</u>, such as discontinuing manufacturing, assembling, and importing fossil-fuel cars and motorcycles by 2040 and ensuring all road vehicles using electricity and green energy by 2050. At offers a way for Vietnam to solidify its competitive position in the EV market regionally and globally and meet the goals of green transportation.



Agriculture has been an important backbone of Vietnam's economy. More than <u>one in every four</u> jobs in Vietnam come from agriculture, forestry, and fishery, with agriculture a significant driver of export growth. Improving productivity in the agriculture sector is therefore critical to boosting economic growth. In particular, Vietnam needs to address various environmental challenges exacerbated by climate change, including <u>erratic rainfall</u>, <u>elevated temperatures</u>, and extreme weather events.

Al can help farmers make agriculture more efficient in Vietnam by enabling real-time data collection on pests and diseases, while also making accurate predictions on temperature, rainfall and wind speed. Headquartered in the Philippines, the International Rice Research Institute (IRRI) - one of Google.org's Al for the Global Goals grantees - is using Al to develop climate-resilient rice varieties that will better equip farmers, including in Vietnam, 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 USD 30 billion after five years.





Improving Healthcare

Al empowers researchers to make data-driven decisions, revealing previously inaccessible insights and accelerating the pace of medical innovation for positive healthcare outcomes. In particular, Al has been shown to improve the quality and speed of diagnoses of diseases that have emerged as serious threats to Vietnamese people's health, including liver, lung, and breast cancer. At Google, we are actively researching robust Al-enabled imaging and diagnostics to assist clinicians. Al-powered diagnostics can also help address capacity challenges in Vietnam's healthcare system.

<u>VinDr</u>, developed by Vietnam's Vingroup Big Data Institute, is an AI-enabled application that supports medical practitioners in diagnosing and detecting lesions on the lung, liver, breast, and spine. VinDr is able to achieve an average <u>accuracy</u> of over 90% for each scan in just a few seconds, and has demonstrated its efficiency in assisting doctors during the Covid-19 pandemic.

Raising the Level of Education

Al brings immense opportunity to education, from personalizing the educational experience to making teaching and learning processes more efficient. In Vietnam, the education sector has embarked on meaningful dialogues on how best to apply Al in education by considering important challenges like data security, infrastructure, and the need for ethical guidelines in this area.

FPT University in Vietnam recently launched a program on "Application of AI in teaching in high schools" that aims to equip high school teachers with proficiency in using AI in their teaching. During this program, Vietnamese teachers receive hands-on training such as on using AI to create lesson plans and learn about the potential ethical risks in AI for education. By February 2024, the program had trained over 3,000 high school teachers.







Keeping Children Safe on the Roads

Road traffic crashes are the leading cause of death among children and young people within ASEAN and worldwide. This challenge is particularly acute in Vietnam, with road traffic incidents the second largest <u>cause</u> of fatalities and serious injuries among children and adolescents.

With funding support from Google's philanthropic arm, Google.org, the 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, it aims to inform new policies and investment in pedestrian-friendly roads that will minimize preventable harm.



Natural disasters, like flooding, are increasing in frequency and intensity due to climate change, threatening people's safety and livelihood. Vietnam has the highest exposure to floods globally, according to the 2019 INFORM Risk Index. The Northern Red River Delta, the Central Coast, and the Southern Mekong River Delta - Vietnam's key agricultural hubs - are vulnerable to floods that threaten economic activities and livelihoods.

AI-based hydrologic technologies can significantly improve flood forecasting, helping to mitigate the impact of adverse weather. Google Research has developed AI models to forecast floods in 80 countries, including Vietnam. Available in Vietnam, Google's AI-enabled flood-forecasting platform, Flood Hub, provides locally relevant flood data and flood forecasts up to seven days in advance. This enables individuals to take timely action and prepare for riverine floods. Forecasts are updated daily, and all information is free of charge and publicly available.







Detecting Deforestation and Protecting Biodiversity

Vietnam is known globally for the quality of its coffee, and its annual coffee bean production has seen accelerating growth. Rapid expansion of coffee crops, however, is driving deforestation that threatens the sustainability of coffee farming in Vietnam.

The <u>Coffee Vision</u> project, led by a <u>partnership</u> between the University of Copenhagen, the Alliance of Bioversity International, and the International Center for Tropical Agriculture, aims to help sustainably manage Vietnam's forests and halt biodiversity loss. The project uses AI and satellite imaging to accurately identify plots devoted to coffee cultivation across Vietnam, which is then overlaid with a history of deforestation to pinpoint coffee-driven deforestation. Ultimately, leveraging AI enables researchers to develop monitoring tools that support the certification of sustainable coffee plots in Vietnam.





An Affirmative AI Policy Vision for Vietnam

The examples above only scratch the surface of what's possible. There is potential for AI to do so much more for Vietnam, significantly improving the lives of people across the country. But as we've learned from prior waves of technology, these benefits are not automatic. Unless people trust and see the benefits in using the technology, and unless governments enable and facilitate its deployment, it will not be adopted at scale in a timely manner.

There has been a growing momentum behind Vietnam's pursuit of a competitive advantage in AI. Vietnam's National Strategy on R&D and application of AI outlines a strategic vision for AI, aiming to establish Vietnam as a center for innovation, development of AI solutions and applications in ASEAN and around the world.

To complement existing efforts, we propose three key recommendations for Vietnam to ensure that Vietnam can harness AI safely and to its fullest potential.



Invest in infrastructure and innovation - investing in AI research and development, access to and quality of digital infrastructure and compute capacity, and providing a supportive policy environment that lowers barriers to AI innovation.



Build an AI-ready workforce - investing in people to ensure they can use and benefit from AI, from students to workers, and from small businesses to large conglomerates.



Promote inclusive adoption and accessibility - harnessing AI across the government and all sectors of the economy to address major societal and economic challenges and ensure the benefits of AI are widely shared.



Investing in Innovation Infrastructure

Countries have historically excelled when they support technological change and harness it to improve living standards. As one example, Vietnam's National Program for Digital Transformation has facilitated the rapid growth of Vietnamese industry in ecommerce, digital financial services, and online gaming, underscoring the importance of policies that enable technological adoption. Similarly, for Vietnam to harness the benefits of AI, it is important to have the right policy conditions in place to allow AI to be built and developed.

Investing in R&D and Al Infrastructure

Vietnam 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. The Vietnamese government should make AI tools accessible to as many entrepreneurs and scientists as possible, allowing more developers to propel innovation in AI technology itself and to leverage AI to accelerate discoveries in other fields.

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

Vietnam's Information and Communication Infrastructure Master Plan for 2021-2030, with a vision to 2050, outlines positive ambitions for developing technical infrastructure essential to AI development. It prioritizes developing universal access to high-speed internet, building green and large-scale data centers, and establishing specialized IT parks and research and innovation centers. These are important building blocks, but recent rankings of AI readiness - including this report by Salesforce - show the challenge in keeping pace with other countries in the region. Vietnam will need to accelerate progress in establishing its AI infrastructure to achieve its ambitions of becoming a regional AI hub.





Cloud Infrastructure: A critical enabler for AI growth

Cloud computing provides the essential foundation that businesses and governments need to fully harness the power of AI. Its vast computational resources, scalable data storage, management, and analysis capabilities are crucial for developing and deploying AI applications.

As articulated in Vietnam's <u>National Strategy on R&D and Application of AI</u>, strengthening **cloud computing is key to fulfilling AI's potential in Vietnam**. To maximize the benefits of AI, we recommend that the Vietnamese government **clearly articulate and adopt a Public Cloud First policy** that prioritizes public cloud-based IT infrastructure and services and other cloud deployment options over on-premise infrastructure. As the public cloud uses shared infrastructure and pools resources in distributed data centers, it tends to deliver much more operational efficiency across use cases than the private cloud. Prioritizing public cloud models will allow businesses to automatically scale up their compute and storage resources while ensuring security, which is essential for AI workloads. This will also enable Vietnamese businesses to capitalize on AI deployment without requiring the capital-intensive investments that would otherwise be needed to fully build an AI infrastructure from scratch.

There should also be **clear frameworks to ensure successful government-industry collaboration**, such as clear procurement guidelines, well-defined performance metrics, and transparent vendor management frameworks. The roadmaps should also prioritize promoting competition to create value for governments and avoid restrictive practices that hinder long-term flexibility.

As part of this commitment, the Vietnamese government could also conduct **targeted cloud and AI opportunity assessments**, focusing on services with the greatest potential for citizen impact – sectors like healthcare, education, and transportation should be prioritized. This can be done in partnership with industry, which can help governments deploy AI solutions on the public cloud.

For example, the Vietnamese government could consider a strategic partnership with the private sector similar to the <u>one between Google and the Royal Thai Government</u>. That partnership involves in which Google Cloud will contribute technology and policy expertise to support 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.



Investing in AI Research and Development

Vietnam will benefit from deepening its support for robust and impactful AI R&D investment. The Integrated Circuit (IC) and AI Research and Training Center in Da Nang, the first AI Training and Research Center (AIC) in Vietnam, will contribute to attracting top AI researchers, innovators, and high-quality investors. As Vietnam develops its AI research and innovation centers, it will be important to consider how to create a more coordinated network of these research centers and promote effective academia-industry coordination. Vietnam may also consider contributing to the creation of ASEAN-wide AI infrastructure so that AI R&D opportunities can flourish throughout the region.

Strengthening Compute Capacity

To build a strong technical infrastructure for AI innovation in Vietnam, investing in AI computing capacity is also essential. As AI becomes more complex, increased computing power will be needed to train and run AI models. For example, FPT University is an early user of supercomputers for Al research in Vietnam. By leveraging supercomputers designed to improve image recognition or natural language processing, FPT was able to expedite its research focused on image and language processing in its FPT.AI platform and product development. Governments around the world are also updating their investment in AI compute capacity: for example, Singapore recently announced investments of up to SGD 500 million (over VND 9 trillion) of investment in compute resources. Continued private sector investment in computing power, for instance the FPT University's and Nvidia's plan to open an Al Factory with a supercomputer system, will help to strengthen Vietnam's AI R&D capabilities.

Promoting Open Government Datasets

In addition, further optimizing the use of public data for training AI models will accelerate meaningful innovation tailored to the Vietnamese context. The National Strategy on R&D and Application of AI states the goal of developing "50 open, linked and connected datasets in different

economic sectors, socio-economic fields" to promote AI R&D and application of AI by 2030. In alignment with this objective, the government has affirmed its commitment towards optimizing open government datasets - including Vietnam's national population database, insurance database, and electronic civil status database - and recently approved a national data strategy, which requires all ministerial and provincial-level state agencies to provide open data on their administrative activities. Fulfilling these commitments will unlock valuable and high-quality Vietnamese-language data that Vietnamese entrepreneurs can use to train AI models.

Pro-Innovation Legal Frameworks

Al is too important not to regulate – and too important not to regulate <u>well</u>. The challenge faced by all governments globally is **how to govern Al in a way that mitigates risks and potential harms without impeding beneficial innovation**. There is a risk that misaligned and fragmented regulatory approaches will block innovators and governments around the world from harnessing trustworthy and beneficial Al applications to achieve strengthened economies, find cures for cancer and other scientific breakthroughs, and ensure longer, better lives for billions of people.

Vietnam is now carefully considering its approach to seizing the AI opportunity while ensuring that AI is developed and deployed safely. The MIC's draft National Standard on AI aimed to establish quality assurance and transparency of AI modules, proposing quality requirements for the safety, privacy, and ethics of AI. Vietnamese officials have also indicated that they are making progress in designing legal regulations aimed at promoting research, development, and application of AI, and Vietnam's National Strategy on R&D and Application of AI envisages the use of sandboxes to enable small-scale, live testing of AI use cases.



We believe there are six major policies that the Vietnamese government should consider to ensure Al researchers and innovators can convert ideas and data into new discoveries, products, and services.

- 1. First, given the cross-border nature of AI governance, it is important that the Vietnamese government ensures that domestic AI laws and regulations are aligned with regional (and global) AI frameworks such as the ASEAN Guide on AI Governance and Ethics, as well as international technical standards for AI. Aligning around regional and international AI frameworks and standards helps avoid regulatory fragmentation and makes it easier for businesses to launch AI products across borders, ensuring that Vietnamese citizens do not miss out on AI applications that improve productivity and wellbeing.
- Second, open data and cross-border data flows are essential to unlocking the data necessary for Vietnamese AI research and development and for the provision of AI services. Allowing access to a larger volume and diversity of data globally, beyond national borders, enables better performing and more accurate AI. According to the OECD, cross-border data flows are particularly important for SMEs, allowing them to efficiently access critical knowledge and information so as to compete with bigger organizations.
- 3. Third, as a general principle, given the cross-cutting nature of AI, it is essential that governments avoid siloed approaches to 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. The National Strategy on R&D and Application of AI has delegated specific responsibilities on AI to fifteen ministries in total. To provide guidance and coordination for the different agencies, the Vietnamese government would benefit from building 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.
- 4. **Fourth, adopting a risk-based approach to AI regulation** focused on the end applications 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. The draft National Standard on AI has outlined that the first step in evaluating AI is to assess whether the AI model presents a high or low risk, suggesting Vietnam intends to pursue a risk-based approach.



- 5. Fifth, in terms of substantive rules, a copyright framework that supports innovation and cumulative creativity including limitations and exceptions that allow developers to train AI models on publicly available data 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 to ensure that copyright frameworks achieve these goals, governments must ensure that users, scientists, innovators, researchers, and the 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.
- 6. Sixth, governments 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. Vietnam's <u>National Strategy on R&D and Application of AI</u> recognized the importance of effective data privacy protection. 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.



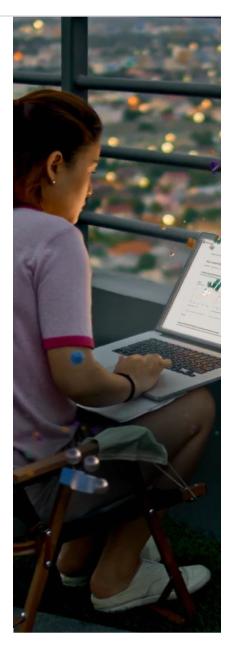
Building an Al-Ready Workforce

Al presents immense opportunities to catapult Vietnam's economy forward through increased productivity and economic activity that can benefit everyone. But Al can also be a disruptive force, and it will present unique challenges compared to prior waves of technology that will require new solutions to ensure it benefits Vietnam's workforce. PwC's 2023 Hoppes and Fears Global Workforce Survey found that employees in Vietnam are largely positive about the opportunities and benefits that Al can bring, with 60% agreeing that Al could improve their productivity at work and 58% believing Al presents opportunities to learn new skills. At the same time, there is concern that Al might also lead to job losses in certain areas.

Given these dual possibilities, the question becomes: how can governments 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 research community? The government will maximize the chance of a successful AI transition if it both develops and attracts top-tier AI talent and equips its broader workforce for the AI era.

Vietnam faces a shortage of specialized AI expertise, with some studies projecting there are only 300 AI experts in the workforce. A report by TopDev, an IT jobs platform, identifies a significant gap between skill levels and market requirements for IT jobs in Vietnam, which are closely linked to AI. The report estimates an annual shortage of about 150,000-200,000 programmers and engineers. Building a skilled AI workforce is critical to ensure that the country meets the demands for adequate personnel to lead AI projects. According to a recent Salesforce report, addressing the shortage of AI talent is vital for increasing the competitiveness of Vietnam's AI sector within the region.

In addition to narrowing the digital skills gap, it is crucial to ensure that AI upskilling and reskilling programs are inclusive and sustainable. For example, there is an opportunity for Vietnam to focus further on <u>female digital inclusion</u> in terms of internet access, digital upskilling, and STEM education.





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. But given the transformative impact of AI across all sectors of the economy, individual company efforts will be insufficient companies will need to stand up new cross-sectoral AI training partnerships to ensure workers in all industries are ready to harness AI.
 - > Google is committed to providing a series of professional training programs on AI in Vietnam, including the five-module training courses of <u>Google AI Essentials</u> under Google Career Certificate, the <u>Google for Startups Accelerator</u> Southeast Asia, Vietnam, complemented by the Google Startup AI Space, and the Google Startup <u>Master Class</u>. Moreover, through initiatives like the Gemini Academy, Google is helping enhance AI literacy across the Asia-Pacific region.
- Academics, foundations, and think tanks must 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 looks forward to expanding activities that enhance community access to AI education.
- And most importantly, governments 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.
 - Within the region, Singapore's <u>National AI 2.0 Strategy</u>, for example, focuses on the need to skill for different types of capability: AI Creators (top-tier AI talent), AI Practitioners (tech workers), and AI Users (enterprises and general workforce).

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

Vietnam has clearly outlined its ambition to equip its workforce for the AI era. The Minister of Information and Communications recently <u>said</u> at the ASEAN Future Forum in Hanoi that, to realize ASEAN's digital future, "we need a new digital institution, a new digital infrastructure, and a new digital human resources". The Minister of Planning and Investment has further <u>underscored</u> the importance of a forthcoming project to develop human resources in Vietnam's semiconductor sector, which will aim to train 5,000 engineers with specialized expertise in AI by 2030.

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 know already - including 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 dynamics. But there are other open questions about Al's impact on work that will need further study, such as how Al can best be 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. Companies, governments, and researchers 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 the education and professional development systems in Vietnam. 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. Positively, Ho Chi Minh City plans to introduce AI teaching programs to the curricula at its secondary and high schools.

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 Gemini Academy, one of Google's AI skilling programs for teachers and educators. 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.



Google is a committed partner in supporting Vietnam in digital and AI upskilling.

Google for Education partnered with <u>AI Education</u>, has run programs to help teachers and educators use AI to enhance learning for students in Hanoi, Da Nang, Ho Chi Minh City and Dong Nai. The programs have introduced AI to more than 2,000 school leaders, teachers as well as provided hands-on practices allowing teachers to experiment with applying Gemini in teaching and learning.

Google's educational initiatives are also supporting education on AI for Vietnamese students:

- "Google Classroom", a digital skills lesson already <u>implemented</u> in several schools in Ho Chi Minh City, enhances students' digital learning experiences, including learning to deploy AI tools.
- The one-academic year <u>pilot program</u> teaching AI knowledge and concepts to 800 students at Le Hong Phong High School for the Gifted in Ho Chi Minh City utilized Gemini as an educational tool. The pilot's positive outcome provides the foundation for the city to further incorporate AI in educational contents for students.

Gemini Academy

Gemini Academy (formerly named Bard Academy) is one of Google's AI skilling programs for teachers and educators, to build AI literacy, explain the basics of AI and learn how to leverage AI tools in education. The program supports the process of technology transformation in the education sector by providing Vietnamese teachers with AI education focused on Gemini, emphasizing its use for creativity, productivity, and support.

To thrive in the AI era, it will be critical for workers to build a more durable skillset of broader and more fundamental competencies. This requires updating and adapting skilling programs across sectors, and building up new public-private partnerships to scale up these programs to reach all workers.

This is a shared responsibility across governments, industry, and research communities. Google has partnered with the <u>Vietnam National Innovation Center</u> (NIC) to support digital upskilling of the Vietnamese workforce, <u>offering</u> 40,000 scholarships as part of the Google Career Certificates for Vietnamese students across 80 universities and agencies.

Looking ahead, there is the opportunity for the Vietnamese government to deepen its work with partners in industry and academia to provide businesses with further guidance on how they can effectively upskill their employees. In the UK, the government has worked with a consortium of academic and policy institutes such as the Alan Turing Institute to develop <u>guidance</u> aimed at helping employers and training providers to boost their employees' understanding of AI so they can use it safely. The guidance systematically maps the skills that different types of workers will need to confidently apply AI in workplace settings.



Supporting Workers in Transition

Al is already helping democratize <u>access</u> to skills and expertise such as coding, language, and writing skills, and promises to enable more people to use productivity strategies that were once the exclusive provenance of workers at the top of the income ladder. By creating more opportunities for more people, Al 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 – that 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.

Key steps that the Vietnamese government can take to build an AI-empowered workforce and support workers in transition include:

- Providing skilling opportunities to younger workers to facilitate a smooth transition to
 Al-enabled jobs, as Vietnam's large, young and tech-savvy population has the potential to turn the
 country into a leading regional AI hub. Google collaborated with Tuổi Trẻ newspaper to organize a
 "AI for Future Careers" workshop. The event shared insights with over 2,000 students about how
 Al could shape the future of work and available training and education resources on practical AI
 skill sets for young workers.
- Encouraging 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.
- Committing to train new researchers within a short timeline (e.g., 18 months) to strengthen national
 Al research capabilities and increase the local supply of Al talent. The recent establishment of
 the Academy of Blockchain and Al Innovation (ABAII), which aims to train 100,000 students from
 30 universities across Vietnam on the use of Al, is a promising development.
- Developing an AI adjustment assistance program 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. Committed efforts to support such adjustment programs are key to ensuring that communities in all regions across Vietnam can take advantage of the greater economic opportunities. Google is committed to supporting AI upskilling and building an innovative AI ecosystem in Vietnam through various AI upskilling initiatives.



Build with AI - equipping the Vietnamese developers with AI skills

"Build with AI", organized by the Google Developer Groups (GDG) community, is a series of events across Southeast Asia aimed at helping developers at all levels learn and apply their skill on Google Generative AI technologies through facilitated hands-on workshops. The "Build with AI" and 3<u>O-day Cloud AI Study Jam campaign</u>" launched in March 2024 in <u>Hanoi</u> and <u>Ho Chi Minh City</u>, in partnership with the <u>National Innovation Center</u> (NIC) of Vietnam. The Ho Chi Minh event was also launched in partnership with the Vietnamese internet company <u>VNG</u>.

Developers gained access to hands-on Google Cloud learning labs, received training on Google's AI technologies including Gemini and Vertex AI, and learned to develop practical, real-world applications alongside a supportive community of peers. Over 1.4k developers completed at least 2 Generative AI training labs (~4 hours of learning), with a total of 9.2k course completion by all participants during the 30-day learning campaign (~36k hours of learning).





Promoting Inclusive AI Accessibility and Adoption

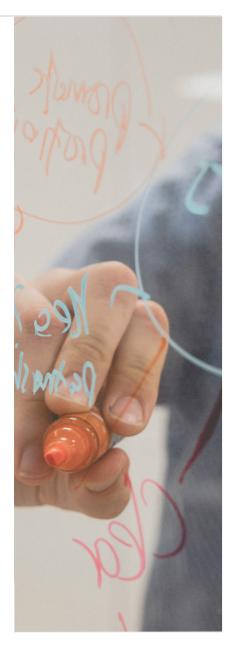
In addition to building AI and preparing students and workers, Vietnam will benefit from ensuring that AI is applied and deployed in a universally accessible and useful way. We must harness AI to **help solve real world problems** – in government buildings, in hospitals, and at kitchen tables. To do this, we have identified three key goals:

- 1. Increase governmental adoption of 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.

Government Adoption of AI

Vietnam's government has recognized the potential of AI for raising the quality of public services. According to Oxford Insights' <u>Government AI Readiness in 2023</u>, Vietnam's government has shown important progress in its preparedness to use AI for public services, climbing to fifth position within ASEAN.

The Vietnamese government stands to gain from adopting AI in two ways. First, it 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, it 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 in terms of AI system performance, can also help mature the quality and safety of commercial and enterprise AI products.





There is strong momentum towards both digitalization and AI use across the Vietnamese government. The National Committee for Digital Transformation's work plan in 2024 allocates responsibility for state agencies in moving towards digital government. In addition, the MIC has approved the development of a Vietnamese LLM and virtual assistants for MIC's civil servants. These developments underline that the Vietnamese government can lead by example in demonstrating the benefits of AI applications.

To identify the most beneficial uses of AI for their citizens, governments can 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 should be to examine existing solutions that are showing promise. Investing in and scaling up these programs could be one of the **best near-term ways for governments to show progress on AI-enabled solutions** and have a huge impact on people.

Finally, governments will need more AI expertise to effectively harness AI. Governments should build and scale up "in-house" AI skilling for their IT and broader workforce; Google took a similar step a few years ago requiring all software engineers to enroll in an internal machine-learning curriculum. Google.org funded Apolitical to build the Government AI Campus, which includes courses, events, and content focused on enabling global public servants to upskill on AI. Governments should also consider creative ways to bring in private-sector talent at leading Vietnamese and global technology companies, such as AI Fellows modeled on the U.S. Presidential Innovation Fellow program and the UK's Government Digital Service.

Helping Traditional Industries and Small Businesses Use Al

Accelerating the adoption of AI across the economy is key for realizing the benefits of the technology in Vietnam. Small businesses and traditional industries have too often lagged behind their peers in adoption of innovative technologies. Among larger companies, <u>Cisco's AI Readiness Index</u> found that only 27% of organizations in Vietnam are fully prepared to deploy AI, despite the majority of respondents in Vietnam acknowledging the transformative benefits that AI can bring.

Governments and AI developers must work together to develop active outreach strategies to traditional industries and small businesses – who have much to gain from AI adoption in terms of their competitive posture if they are quick to harness and deploy AI.



The following measures have been shown to help traditional industries and small businesses adopt Al:

- Identify key barriers to AI adoption across industry. The lack of skilled AI professionals is often <u>considered</u> one of the most significant challenges that Vietnamese governments and industries face when it comes to adopting AI. This underlines the importance of the government working with industry and academia to develop educational workshops, seminars, specialized training programs, and scholarships for AI education. The Academy of Blockchain and AI Innovation, for example, is offering 1,000 scholarships for AI courses.
- 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. In Vietnam, AI has been more extensively applied in the telecommunications, finance, and media sectors, while other sectors like manufacturing are yet to fully capitalize on AI's potential.
- Give small businesses a "digital 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.
- Target Al training resources towards small businesses and traditional industries in underserved communities.
 Google's Google for Startups Accelerator Southeast Asia, Vietnam and Google Startup Masterclass Series provide targeted training for Vietnamese startups. Grow with Google, a global initiative that provides a free source for training and tools for individuals and businesses to upskill digitally, has particularly empowered Vietnamese MSMEs' digital adoption. But there is a need for government and industry to work together with academia and non-government organizations to deliver Al training on a larger scale, to ensure that communities across Vietnam can benefit from Al.
- Improve access to capital, including by introducing low-interest loan and grant programs designed to support Al-driven transformation. A 2023 Salesforce report on Business Al Readiness scored Vietnam lower than other countries in the region such as Indonesia, Thailand, and Malaysia for Venture Capital Availability & Valuation. More broadly, other governments in the region are focusing on creating a policy environment more favorable to startup growth. Malaysia's Ministry of Science, Technology and Innovation (MOSTI), for instance, recently launched its Al Sandbox Pilot Program to facilitate the creation of up to 900 Al startups by 2026.



Enabling Regulation and Standards

At the same time, it is important that Vietnam's regulatory and policy frameworks empower small businesses and traditional industries seeking to adopt AI. Any regulation relating to AI should be proportionate, risk-based, and focused on specific applications, recognizing that AI is a general purpose technology. Regulatory requirements should be calibrated to the particular risk and use case so as to provide SMEs with the necessary legal certainty and confidence to ensure all sectors and regions can benefit from AI.

Vietnam will benefit from two streams of regulatory actions: firstly, ensuring that underlying regulatory regimes such as those relating to intellectual property facilitate AI innovation; and secondly, providing appropriate regulations to govern AI tools once they are developed. Regulatory requirements should recognize that AI is a general technology and be calibrated to the particular risk and use case, so as to enable broad adoption and deployment of AI by SMEs. In certain instances, the regulators should provide additional clarity on when and how existing Vietnamese laws will apply to AI applications.

Vietnam can also accelerate AI adoption in Vietnam by promoting the use of common technical standards. Common standards mean that where a small business is required to show its compliance with a regulation, it can do so by showing adherence to the common standard, rather than having to meet a bespoke requirement. This improves confidence and certainty for businesses and will help to ensure more beneficial applications of AI across Vietnam. It will be beneficial for Vietnam to maintain its engagement with international standards bodies focused on the responsible development of AI systems, in particular the ISO.

Towards an AI Future

Vietnam is well-positioned to benefit from the AI opportunity. Developing AI policy frameworks that balance safety, security, and innovation is critical to realizing the potential of AI technologies to serve Vietnamese society and to allow Vietnam to turbo-charge its economic development. We look forward to partnering with the Vietnamese government, industry, and research institutions to build an AI-driven future that benefits everyone.

