October 2024

AIAI

THE AI ADOPTION INITIATIVE

AI, EVERYWHERE, ALL AT ONCE

A new policy agenda for AI success through faster adoption

Marc E. Ouimette Ed Teather Kevin Allison

Introduction

The advent of generative artificial intelligence has renewed interest in the role that public policy can play in supporting technology-enabled economic growth and innovation. Meeting in Italy in June, G7 leaders agreed to "work to ensure that AI enables increased productivity, quality jobs, and decent work" and "bolstering the adoption and development of new technologies, including AI."[1] As large AI models trained on massive amounts of computing power have attracted increasing attention, the global policy discussion has been largely focused on promoting and governing frontier model development and cutting-edge capabilities.

We argue for a different approach, focused on putting the ***production, uptake and diffusion*** of economically useful AI applications at the center of AI industrial strategies. Earlier-stage research is valuable for its own sake, and is tied to the successes of many frontier AI companies. However, we argue that making the most of AI's potential to increase national productivity growth will depend not just on whether governments invest large sums in pushing the boundaries of AI R&D, but also on using policy levers to help equip companies and workers with the tools and skills needed to build and deploy industry-specific AI applications that solve real-world problems.

"We are past the theoretical projections of a decade ago and can now measure the impact of both traditional AI applications and early signs of productivity gains from generative AI"

We are past the theoretical projections of a decade ago and can now measure the impact of both traditional AI applications and early signs of productivity gains from generative AI. The results suggest that AI can significantly boost worker productivity in narrow occupational tasks. Moreover, the technological building blocks needed to help many different companies create, fine-tune, and deploy useful AI applications are now in place and are increasingly available off-the-shelf. The problem, to paraphrase the author William Gibson, is that the AI-enabled productivity revolution is not widely distributed yet. Uneven adoption of AI between and within countries, regions, demographic groups, and economic sectors means it is only just starting to deliver on its potential. Overcoming these barriers will require a different set of tools, and a wider policy conversation, than the more R&D-focused AI policy discussion that has prevailed in recent years.

The lag between innovative new capabilities and widespread adoption fits a historical pattern seen in past technology transitions. In his recent book, Technology and the Rise of Great Powers, the George Washington University professor Jeffrey Ding notes that, beginning in the 19th century, it took five decades for the invention of the electric dynamo to translate into broad-based productivity gains. These gains happened "only after factories had restructured their layouts and there had been interrelated breakthroughs in steam turbines."[2]

The key insight is that uptake and diffusion of a new general-purpose technology requires more than just a single breakthrough, or companies that are pushing the cutting-edge of technology development (though these do have important economic value for national economies). It also requires creating the right conditions to encourage companies of different sizes and levels of technological sophistication to use the technology to solve practical problems and transform their sectors and businesses. It requires fostering a broader user base that can support

[1] Apulia G7 Leaders' Communiqué 2024.

[2] Ding, Jeffrey. Technology and the Rise of Great Powers. Princeton University Press (2024: 7).

and interact with the new technology; changes to business processes; the development of standardized tools and approaches that allow the technology to be used by people in many different settings; equipping workers who may have varying levels of technical knowledge with the skills necessary to use it to solve specific challenges in specific domains; and other more incremental changes to enable diffusion of a new technology at an economy-wide scale.

Government policies that support these efforts have the potential to shorten the time needed to unlock AI's productivity benefits. In November 2024, AWS and partners will convene a workshop in New York to examine how policymakers can accelerate AI adoption, with the goal of producing a policy compendium on the topic. This paper, which serves as a pre-read for the workshop, provides a framework for thinking about AI diffusion. It explains why diffusion matters. It discusses how the different parts of AI's supporting technology stack contribute to the more widespread uptake and adoption of AI. It also outlines initial ideas for how both demand-side and supply-side policy levers can accelerate AI diffusion and realization of broad-based productivity gains.

Contents

1. Diffusion: A new way of thinking about AI industrial strategy

Governments' interest in artificial intelligence stems in part from the idea that AI presents a once-in-a-generation opportunity to boost economic growth through higher productivity. There are good reasons to think so. History suggests that productivity gains from technology are one of the best ways for workers to improve incomes and living conditions. Economic research indicates that as much as 75 per cent of the difference in incomes between countries can be explained by the differences in the rate of adoption of productivity-enhancing technologies.[3]

"The often unassuming process by which an innovation spreads throughout an economy."

As a rule, countries that are quicker to adopt new technologies grow faster. In Technology and the Rise of Great Powers, Jeffrey Ding presents evidence that the countries that benefit most from technology revolutions are not necessarily those that are the first to innovate, but those that are the best at absorbing and diffusing new technologies throughout their economies.

However, diffusion can be a slow process, as companies and consumers grapple with technical, institutional, bureaucratic, and barriers to adoption. This has been true of other new general-purpose technologies, from electricity to the personal computer.

Ding's thesis, and ours, is that governments that want to unlock AI's productivity benefits should not focus solely on "the most dramatic aspect of technological change - the eureka moment," but also on "the often unassuming process by which an innovation spreads throughout an economy."[4] In other words, making the most of AI depends not just on advances in frontier AI models, but crucially also on accelerating the workmanlike adoption of AI to solve practical problems in many different industries.

Despite ongoing advances in capabilities, AI adoption since 2017 has been slow in practice in many countries, including many in the G7. Consider Canada. Despite being a leading center for AI research, the country is an adoption laggard. A 2023 study by the Dais Institute found that less than 4 per cent of Canadian businesses in Canada had adopted AI as of 2021.[5] The challenge is shared more broadly: Goldman Sachs has shared that, as of March 2024, 5% of businesses are regularly using AI in production. [6] Lack of institutional knowledge of AI technologies and scarce talent were cited as the most common barriers to wider use.

Some countries are moving much faster. India, Singapore, and the UAE have emerged as adoption leaders, with adoption rates 50 per cent higher than the global average (including Canada, the U.S., and the major European economies).[7]

There is growing evidence that productivity gains will follow. Researchers at the Massachusetts Institute of Technology, for example, have demonstrated a 50 per cent increase in productivity

[3] Comin, Diego and Martí Mestieri. 'If Technology Has Arrived Everywhere, Why Has Income Diverged?', American Economic Journal: Macroeconomics, 10 (3): 137–78 (2018).

[4] Ding, Jeffrey. Technology and the Rise of Great Powers. Princeton University Press (2024: 210).

[5] Many surveys tend to overestimate the level of adoption by businesses due to low response rates / sample sizes that skew the results. Statistics Canada's Survey of Digital Technology and Internet Usage surveys businesses across Canada. Because the responses are mandatory, the rate is much higher and more representative than other surveys.

[6] Goldman Sachs, "AI is showing 'very positive' signs of eventually boosting GDP and productivity", 2024.

[7] IBM Global AI Adoption Index 2023.

for mid-level professional writing tasks among research subjects who had access to generative AI,[8] and a doubling of productivity growth from AI-augmented R&D.[9] Harvard Business School has found that consultants with access to LLMs increased their speed on a selection of consulting tasks by 25 per cent, and the quality of performance by 40 per cent.[10] Software developers using Amazon's CodeWhisperer AI coding assistant are completing tasks 57 per cent faster.[11]

Going beyond these test cases to deliver broad-based productivity gains will require wider adoption of AI by companies operating at many different scales across different sectors of the economy. Analysis by the Institute for Public Policy Research (IPPR) suggests that the gains seen in these relatively narrow cases may indeed be scalable. IPPR found that 11 per cent of tasks across the UK (measured by hours worked) could leverage generative AI tools that are already commercially available to consumers, representing 'low hanging fruit' for businesses.[12]

Importantly, IPPR found that a further 59 per cent of work tasks could benefit from more integrated AI systems, which are typically deployed by companies and require strategic effort and coordination at the enterprise level. This is arguably the modern equivalent of the changes in "factory layout" required to take advantage of electricity, as Ding argued.

As such, the data suggests that governments don't need to wait for AI capabilities to cross some future performance threshold to start reaping the economic benefits of AI. Promoting the diffusion of technologies that are already accessible, particularly among companies that can deploy them at enterprise-scale, could help accelerate the realization of AI-driven productivity gains.

[8] Noy, Shakked and Whitney Zhang. 'Experimental Evidence on the Productivity Effects of Generative Artificial Intelligence'. Science 381,187-192 (2023).

[9] Besiroglu, Tamay, Nicholas Emery-Xu, and Neil Thompson. 'Economic impacts of AI-augmented R&D', Research Policy 53(7) (2024).

[10] Dell'Acqua, Fabrizio et al. 'Navigating the Jagged Technological Frontier: Field Experimental Evidence of the Effects of AI on Knowledge Worker Productivity and Quality'. Harvard Business School Technology & Operations Mgt. Unit Working Paper No. 24-013 (2023

[11] Roberts, Steve. 'Amazon CodeWhisperer, Free for Individual Use, is Now Generally Available', AWS News Blog 13 April 2023.

[12] Jung, Carsten and Bhargav Srinivasa Desikan. 'Transformed by AI: How generative artificial intelligence could affect work in the UK – and how to manage it,' Institute for Public Policy Research (March 2024).

2. Understanding AI diffusion starts with understanding the AI stack

Understanding how the different parts of the AI technology space work together is important for developing a more nuanced understanding of how national strategies can support broader adoption and diffusion. This starts with understanding that AI is not a single technology, but an approach to computing that relies on a stack of underlying technologies and inputs.

At the bottom of the stack, the fundamental building blocks of AI include raw computing power used for both training and inference, increasingly provided by advanced semiconductors that have been optimized for AI workloads, and large datasets used for AI training. While some companies own these resources directly, most companies, including both large firms and the far more numerous small and medium-sized businesses that will be essential for broad-based AI adoption, access them through the internet, using infrastructure built and maintained by cloud services providers.

Some AI applications, especially those whose performance depends on low latency, will also increasingly run on endpoint devices and other edge computing infrastructure that is located close to end users. However, the underlying models that drive these applications will also largely be designed, trained, and refined using infrastructure and tools hosted on and accessed via cloud services.

“Some AI applications, especially those whose performance depends on low latency, will also increasingly run on endpoint devices and other edge computing infrastructure that is located close to end users”

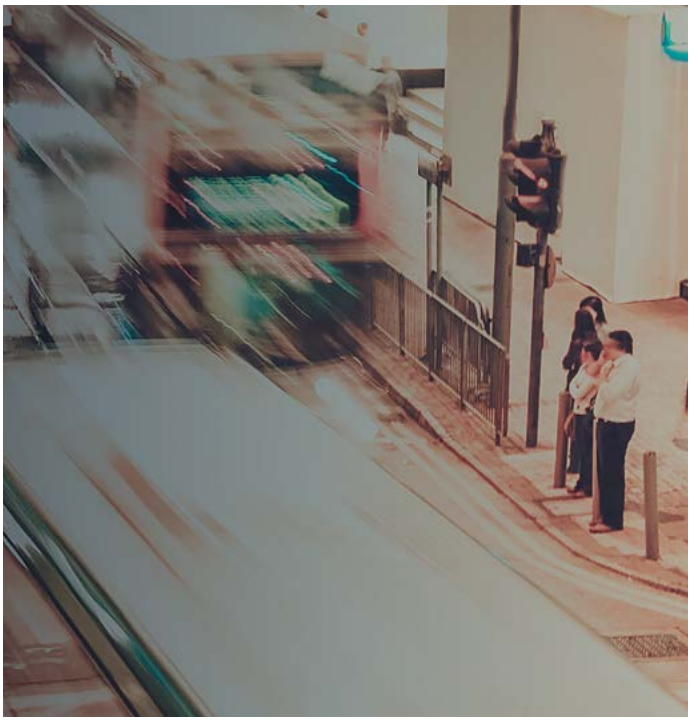
Cloud services themselves consist of multiple layers of technologies and tools, each of which plays a different role in the process of AI innovation and diffusion. In the table below, we differentiate between three different layers in the cloud portion of the AI stack, or “cloud stack” for short:

Table 1: The Cloud Stack

Layer	Description
AI applications	Chatbots, AI assistants, and other specific AI applications that make use of LLMs and other foundation models. These services offer capabilities such as coding, app and content creation, knowledge retrieval, and customer action. These applications tend to be off-the-shelf, not typically requiring in-depth technical knowledge of AI to use in business contexts. These commercially available, off-the-shelf AI applications are already driving significant productivity benefits for users.
AI tooling	A software layer that allows customers to build their own models or to create and scale customized generative AI applications using models and datasets from a number of different providers. Easy access to AI tooling allows customers to fine-tune and augment the models they build with their own proprietary company data. It also makes capabilities such as retrieval augmented generation, which supplements user prompts with information from proprietary company data to improve reliability and performance. The AI tooling layer will also become increasingly important for enabling companies to comply with emerging regulatory regimes.
Computer infrastructure	The raw compute and associated networking, frameworks, and services that organizations can use to build their own foundation models, by performing computations on substantial data sets. This layer is typically only accessed directly by companies developing cutting-edge foundation models, which generally have sophisticated engineering organizations and access to significant data resources.

As governments have intensified efforts to develop and implement national AI strategies in recent years, the compute infrastructure layer of the stack has attracted significant policymaker attention. Today, many governments view access to compute – either directly, through physical possession of computing clusters, or indirectly, by renting access to compute through the cloud – as important to advance and secure cutting-edge AI capabilities, and, by implied extension, for economic growth and national security.

Access to the compute infrastructure layer is important for supporting AI development, but it is insufficient to drive widespread AI adoption. This is because building advanced AI models on top of raw compute requires specific engineering resources and programming expertise. Sales teams, supply chain managers, shop floor engineers, and other people working in different economic sectors that are trying to solve specific business problems using AI are unlikely to have the engineering knowledge needed to interact directly with the compute infrastructure layer in this way. Instead, they will access AI indirectly, through the next layer of the cloud stack: software-based AI tooling.



“As more enterprise software incorporates AI features, AI adoption rates will become increasingly tied to adoption of enterprise software via the application layer.”

The tooling layer sits above the compute infrastructure layer. It is a software interface that helps companies and other organizations build AI applications using a variety of models, data sources, libraries, and other increasingly off-the-shelf tools. The tooling layer also enables companies to fine-tune AI models using proprietary data, or to use other techniques such as retrieval augmented generation (RAG) to improve performance and reliability for a specific task, without the need to build their own software from scratch.

The tooling layer will also be increasingly important for helping companies build AI models and applications that comply with emerging regulatory regimes, by helping them follow regulatory standards and best practices, and by offering high levels of data protection and other useful features, such as logging and access controls.

The tooling layer acts as a critical intermediary between the raw compute and data resources that power AI, and users who want to use AI to solve real-world problems. These users will include both large companies and small and medium-sized businesses operating at varying levels of sophistication and technical readiness. This democratizing function makes the cloud’s tooling layer an important enabler of AI diffusion, helping many different companies address practical, immediate needs.

An even greater number of companies and consumers that use AI will not want to create AI applications at all. Instead, they will use AI applications and services that are created by other companies and made available to end-users through the top layer of the cloud stack, the application layer. As more enterprise software incorporates AI features, AI adoption rates will become increasingly tied to adoption of enterprise software via the application layer. Many users may not even recognize these applications as “AI” at all, even though their backend is traditional AI. Applications that help with expense reporting, advanced CRM tools, and so on fall in this category.

3. Identifying opportunities to drive AI adoption: prioritizing sectors

Understanding which sectors are leading and lagging on AI adoption could help policymakers better target policies supporting a more diffusion-focused approach. A recent OECD analysis across 11 countries indicated that national AI adoption rates vary widely by firm size, industry sector, and geographic region.[13]

Company size is a clear dividing line. In Canada, for example, the Dais Institute found that while 20 per cent of larger companies with over 100 employees had embraced AI, only 3 per cent of smaller firms had done so.[14] The fastest-adopting sectors in Canada – utilities, information/culture, and finance – are over 10 times more likely to have implemented some form of AI compared to laggard sectors. These laggards include some of the country's most economically important industries, such as real estate, manufacturing, healthcare and retail.

AI adoption is also uneven across some sectors, even in cases where the potential for uptake appears significant. U.S. manufacturing, for example, has been adopting AI at a rate three times the national average, whereas manufacturing in both Canada and the UK lags behind their respective national averages, clearly suggesting latent potential, or "low hanging fruit" to quickly improve adoption ratios.[15]

Anecdotal evidence supports the idea that targeting specific sectors can help speed up adoption rates. Singapore, India, and the UAE, countries with AI adoption rates 50 per cent above the G7 average, have each identified priority sectors within their national AI strategies.[16]

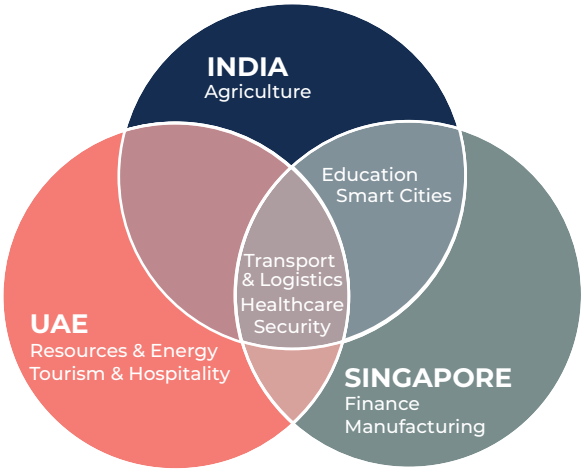
[13] Flavio Calvino and Luca Fontanelli. 'A portrait of AI adopters across countries: Firm characteristics, assets' complementarities and productivity', OECD Science, Technology and Industry Working Papers, No. 2023/02, OECD Publishing, Paris (2023).

[14] Lockhart, Angus. 'Automation Nation? AI Adoption in Canadian Businesses', The Dais (2023).

[15] Breaux, Cory and Emin Dinlersoz. 'How Many U.S. Businesses Use Artificial Intelligence?' U.S. Census Bureau, 28 November 2023.

[16] IBM Global AI Adoption Index 2023.

Figure 1: Priority sectors in national AI strategies



Our discussions with governments that are at the forefront of AI adoption have identified some common trends that merit further investigation. On the demand side, adoption leaders are taking a strategic approach to accelerating AI adoption in priority industry verticals across the public and private sectors. They are concentrating efforts on where solutions are readily available and proven, but where adoption is low.

Some forward-thinking governments are making significant investments in education systems, workforce upskilling programs, and other efforts to support what Ding has described as the "AI-adjacent skill base". These may also benefit from a sector focus.

Identifying priority sectors can focus policy efforts and help guide how other policy levers, such as workforce skilling and talent policies, R&D support, and sectoral regulation can be designed, targeted and coordinated to optimize for diffusion. Targeting specific sectors can also help mobilize different stakeholders, including universities, the public sector, regulators, businesses, and other institutions that play an important role in AI adoption, to work together on specific programs.

For example, a policy targeting the healthcare sector might bring together universities, hospitals, governments, support from cloud services providers, and SMEs to drive targeted projects, focused on sector-specific challenges or use cases.

An initial scan for priority sectors could start by ranking industries based on the extent to which the country holds an existing comparative advantage in that sector. Public services and sectors that are large employers or play other key roles in local economies may also rank higher in initial screenings. This initial screening could be combined with further analysis of the level of existing AI adoption in a given sector and the availability of easily adaptable or off-the-shelf AI solutions to derive a ranked list of priority sectors for targeted, diffusion-oriented policies. Our suggested approach would prioritize sectors where AI adoption is low, the availability of AI solutions is high, and where the country has a comparative edge.

A specific sector's ranking score could be calculated using the equation:

$$R_i = \frac{(1 - A_i) \cdot S_i \cdot C_i}{N}$$

Where:

R_i is the result score for sector *i*.

A_i represents the sector's level of AI adoption, ranging from 0 to 1 (0 represents no adoption, 1 represents full adoption).

S_i represents the availability of AI solutions relevant for that sector, ranging from 0 to 1 (0 represents no availability of solutions, 1 represents full availability).

C_i represents the comparative advantage of the sector (this can be a value from a predefined scale).

N is a normalization constant to scale the result score appropriately, which could be set to the maximum possible value of the product of $S_i \cdot C_i$, ensuring the result is standardized.

Applying this framework to create a ranked list of priority sectors could help governments more systematically identify where policies to increase diffusion of AI technologies have the potential for the greatest impact.

To reliably identify priority sectors, design effective policies, and overcome uneven adoption patterns, governments must also develop a more granular understanding of the AI landscape. This should include regularly surveying national AI adoption trends, with the data gathered and published by national statistical agencies in alignment with the OECD's model survey on business ICT usage.[17]

A recent Dais Institute study, which used regression analysis to identify potential factors driving AI adoption in Canada, shows the value of such comprehensive, sector-level datasets, which capture both overall adoption rates and the specific technologies being used, their applications within the business, and the key barriers and drivers.[18]

Equipped with this kind of detailed, granular data, governments can strategically target their support (i.e. identify policies to increase the value of A_i in the above equation) and tailor their broader suite of policies appropriately. As noted by the Tony Blair Institute, boosting AI usage in competitive, trade-exposed sectors could be particularly powerful, as productivity gains in these areas tend to benefit the wider economy (the C_i score in the above equation can reflect this, or other motivating factors).[19]

Identifying industries where AI solutions are widely available (the S_i score) will likewise require governments to conduct in-depth research and to engage in dialogue with AI developers, consultants, and researchers familiar with both the state of

[17] The OECD Model Survey on ICT Usage by Businesses.

[18] Lockhart, Angus. 'Automation Nation? AI Adoption in Canadian Businesses', The Dais (2023).

[19] Kakkad, Jeeger, Eleni Arzoglou and Henry Li. 'Accelerating the Future: Industrial Strategy in the Era of AI', Tony Blair Institute Paper (March 2024).

AI development and back-office and front-office functions across different industries. Examining whether S_i varies significantly between companies of different sizes within a particular industry, or between regions of a country, could also yield insights into more targeted demand-side strategies for promoting AI adoption.

By designing policy to address both demand for and supply of many different types of AI systems, governments can more systematically prepare businesses, workers, and the public sector to be 'AI-ready' and capture opportunities that will be created in the coming years. Below, we highlight examples of demand-side and supply-side policy levers that can support wider diffusion of AI, including case studies of policies that are currently in action around the world.

“Identifying industries where AI solutions are widely available (the Si score) will likewise require governments to conduct in-depth research and to engage in dialogue with AI developers, consultants, and researchers familiar with both the state of AI development and back-office and front-office functions across different industries”

4. Demand-side and supply-side policy levers can drive more rapid adoption

Demand-side policies create market signals that encourage AI adoption. One example of a government-driven demand-side action to promote AI diffusion is for the government to buy and use AI technologies directly, through public procurement. Demand-side measures can also include policies and strategies aimed at addressing skill gaps or removing barriers to AI adoption by other participants that are potential buyers and users of AI services. Both approaches potentially create new demand for AI, helping to drive broader uptake.

Supply-side measures help foster the wider technology industry that makes AI accessible. This includes both companies that develop and deploy AI systems, and a broader set of companies that provide the underlying technology stack that powers AI. It likewise includes companies and workers operating at many different scales and levels of technological sophistication that will apply AI to solve real-world problems.

4.1 Demand-side levers

4.1.1 Make the whole workforce ready: Invest in the craft of applied AI

It is tempting to view AI skills through a narrow, supply-side lens: increasing the supply of computer science graduates and other technologists who can contribute to new AI breakthroughs is a priority for many governments. However, AI diffusion is unlikely to come through early-stage R&D alone; it will require equipping a broader set of workers across many sectors with the skills needed to apply AI in industry-specific settings.

Broadening the AI skills base in this way can increase demand for AI by equipping companies outside the traditional tech sector with an ability to apply AI tools to their specific business problems. By combining AI knowledge, domain expertise, and unique company data, workers can use the tooling and application layers of the AI stack to design and build practical AI applications, driving uptake across the wider economy. As Jeffrey Ding points out, "investing in the broader AI-adjacent skill base will become more crucial than cornering the best and the brightest AI experts" in order to take advantage of these technologies as they are rolled out.[20]

Policies focused on cultivating more in-house, working-level AI talent in priority sectors could have a particular impact on small and medium-sized businesses. These businesses, which comprise the majority of companies

[20] Ding Jeffrey. Technology and the Rise of Great Powers. Princeton University Press (2024:, 197).

Table 2: Core AI and AI-adjacent skill clusters[22]

AI Category	Skill Cluster	
Core AI	Artificial intelligence	Machine learning
	Data Science	Natural language processing
AI-adjacent	Automation engineering	Medical research
	Data mining	Research methodology
	Data science	Robotics
	Economics	Scripting languages
	Industrial automation	Signal processing
	IT automation	Statistical software
	Mathematical modeling	Statistics
	Mathematical software	System design and implementation
	Mathematics	Test automation

[22] Ibid.

Singapore's Go Digital Program

Singapore's Go Digital program is a government initiative designed to help small and medium enterprises accelerate adoption of digital technologies and services. SMEs account for two-thirds of Singapore's workforce and nearly half of national GDP.

The program offers SMEs access to "virtual CTOs" and other expert consultants. It helps companies in different sectors assess their digital readiness; gain access to grants and digital solutions; and connect to global opportunities through e-commerce marketplaces.

Since the launch of Go Digital, more than 80,000 SMEs have adopted digital solutions from the program. Through Go Digital's CTO-as-a-service, SMEs receive recommendations on digital solutions they can adopt, including the relevant grant support available, based on their business profile and needs. The program also provides relevant news and case studies of SMEs that have been digitalized, to help companies learn from the experiences of their peers. SMEs can likewise access a shared pool of digital consultants providing project management services and advice on business needs, training roadmaps, and other services.

in a typical economy, tend to lag behind larger firms on AI adoption. Skills, technical knowledge, access to funds to invest in technology, organizational bandwidth, readiness constraints, and regulatory considerations can all present challenges for smaller enterprises.

AI-adjacent skills promise to be of particular importance. Demand for these skills has been significantly higher than for "core" AI skills: an analysis of online job postings found that as of 2019 there were 3 million postings for AI-adjacent jobs, compared to only 320,000 in "core" AI (see table).[21] AI-adjacent roles include positions like data curators (responsible for sourcing, collecting, and organizing high-quality datasets that are diverse, representative and properly labeled), which are critical for building the surrounding environments into which companies can incorporate AI applications and tooling in their business workflows.

As the Boston University economist James Bessen has observed, the rise of cloud-based AI services (i.e. the tooling and application layers of the stack) is mitigating many of these factors by providing accessible AI tools to SMEs.[23] For example, Amazon Q Business helps small teams automate administrative tasks and quickly access company knowledge, while QnABot allows resource-constrained SMEs to provide round-the-clock customer support without expanding staff. These tools, combined with workforce skills policies that focus on the craft of applied AI, can help smaller companies leverage sophisticated capabilities typically associated with larger enterprises, enhancing their competitiveness without requiring extensive in-house technical expertise or significant upfront investments.

Singapore's Go Digital program, which includes a focus on AI, is a notable example of a program that is accelerating AI adoption among SMEs and within priority sectors (please see box above). Singapore's government estimates that the program has driven an average increase in firm productivity of 3 per cent.[24]

[21] Toney, Autumn, and Melissa Flagg. "US Demand for AI-Related Talent." CSET Data Brief. Center for Security and Emerging Technology, August 2020. 3–4.

[23] Bessen, James. The New Goliaths: How Corporations Use Software to Dominate Industries, Kill Innovation, and Undermine Regulation. Yale University Press (2022).

[24] Calvino, Flavio and Luca Fontanelli. "A portrait of AI adopters across countries: Firm characteristics, assets' complementarities and productivity", OECD Science, Technology and Industry Working Papers, No. 2023/02, OECD Publishing, Paris (2023).

Singapore is now building on its approach with the recently launched Digital Enterprise Blueprint.[25] Key elements of Singapore's approach to SME AI adoption include sector-tailored Industry Digital Plans (providing guidance on use cases and available tools), AI readiness assessments, and Jobs Transformation Maps (organized by job roles across sectors, these help employers and workers to plan for job redesign and training with 200 AI courses), as well as subsidized access to cloud-based AI services (50 per cent cost for early SME adopters for up to 12 months). The government has secured partnerships with the tech industry and local business associations to maximize the impact of these efforts.

Industry surveys regularly cite shortages of AI talent and skills as a leading barrier to adoption. To address this challenge, governments are increasingly devising national workforce skills strategies for AI. These strategies typically cater to several cohorts: those developing AI systems within AI-first companies; those deploying AI systems in broader industry contexts; and those using AI in the workplace in complement to their wider skill sets.

Hiring AI-skilled talent is a priority for nearly three-quarters of U.S employers, and 80 per cent of workers would be interested in developing their AI skills. However, most employers say that they are unable to meet their AI talent needs at present. Over four in five employers say they don't know how to implement an AI training program. A similar percentage of employees say that they aren't sure what training programs are available to them.

To ensure that both workers and industry can embrace the opportunities from AI, governments should consider national campaigns to raise awareness and to prepare their workforces to be 'AI-ready'.

The types of skills these programs target matters. Elite researchers have an important role to play in the overall trajectory of AI, but policies that encourage the development of more applied AI skills may be more important for promoting diffusion. The OECD's October 2024 "G7 Toolkit for Artificial Intelligence in the Public Sector," for example, notes the challenge that public sectors face in upskilling workers, but this focuses

[25] Singapore Digital Enterprise Blueprint.

primarily on core AI skills, rather than AI-adjacent or applied AI skills.[26]

In Technology and the Rise of Great Powers, Ding argues that the rise of mechanical engineering departments at US universities, which helped churn out millions of working-level engineers to fill American factories, was one of the decisive factors that drove the US to overtake leading economies such as the UK and Germany during the period of rapid industrial development that took place from 1870 to 1914, despite the other two countries' comparative strengths in R&D.[27]

Efforts to promote the widespread diffusion of AI-related and AI-adjacent skills may likewise benefit from investing in upskilling via applied AI programs at community colleges and more AI content in vocational training programs. Where more research-oriented programs focus on increasing the supply of elite engineers, applied programs would emphasize combining sector-specific domain knowledge with programming, data science and other skills needed to

[26] OECD/UNESCO (2024), G7 Toolkit for Artificial Intelligence in the Public Sector, OECD Publishing, Paris.

[27] Ding, Jeffrey. Technology and the Rise of Great Powers. Princeton University Press (2024: 118).

use software-based AI tooling or existing, off-the-shelf applications to solve practical problems using AI.

Similar to the way agricultural extension programs share practical knowledge with farmers about new technologies and business practices that could bring greater efficiencies, an AI analogue of agricultural extension could help small business or other companies in targeted sectors acquire a sufficient baseline awareness and understanding of AI needed to start applying it in context. The Dais Institute's analysis on AI adoption rates found that, apart from firm size, broad upskilling of ICT workers had the biggest impact on national AI adoption rates, lifting the average adoption rate by 16 per cent.[28]

Countries that have invested significantly in ICT upskilling have seen some of the most significant adoption rate improvements: India, for example, has trained 700,000 ICT professionals and government officials on AI in four years through its FutureSkills Prime initiative,[29] pushing the country to the top spot in IBM's global AI adoption index.[30]

[28] Lockhart, Angus. 'Automation Nation? AI Adoption in Canadian Businesses', The Dais (2023).

[29] Lessoff, Jacqueline, Besher Massri and Luis Aranda. 'Data from tech and social platforms underline the success of India's AI upskilling policies', OECD AI Policy Observatory, 1 February 2023.

[30] IBM Global AI Adoption Index 2023.

FutureSkills Prime

In a study of 47 initiatives representing global best practice in lifelong learning, India's FutureSkills Prime was the highest ranked for ICT skills.[31] Under the program, eligible learners are reimbursed for accredited courses and certified upon course completion. In addition to ranking FutureSkills Prime as a best practice example, the study notes that public funding is "particularly fundamental for SMEs, as engagement in up- and reskilling activities for them is often associated with financial challenges".

[31] European Innovation Council and SMEs Executive Agency. 'The Study on up- and reskilling policy initiatives supporting Pact for Skills is now published'. EISMEA News, 26 February 2024.

A national focus on upskilling for AI should also extend to non-ICT workers. The Dais Institute finds that this can also have a positive impact on adoption. Upskilling can help non-ICT specialists find ways that AI tools can complement their most valuable skills, help them rally support for the implementation of AI in different business contexts, and understand the nature and limits of the tools they are already using.

Deloitte's research of current workplace use suggests that this could help low-frequency users (many of whom cite not knowing how to use generative AI well as a barrier) and other users who may be unaware of risk and limitations of AI systems more effectively make use of the technology (36 per cent of users believe generative AI systems are always accurate, for instance).[32] Alongside India's example, Singapore's approach to SMEs, referenced above, also potentially offers a starting point for AI policymakers considering this area.

Along with supporting the development of applied AI programs at universities and business schools, governments have a critical role to play in supporting programs that enable members of the workforce to acquire new skills while on the job. Expanding policy support for worker retraining and upskilling to include support for short training sabbaticals or part-time applied AI courses can help make existing workers more AI-ready.

[32] Deloitte, 'AI study: Over 60 per cent use Artificial Intelligence at work'. Deloitte Newsroom, 28 August 2023.

As a first step, existing policy incentives for employers to invest in training (such as the UK's apprenticeship levy) should be flexible enough to help foster a marketplace for upskilling and reskilling in AI. Many providers already offer upskilling/reskilling initiatives: AWS Skill Builder for example features 100+ learning resources on AI and ML in a mix of formats, complemented by a Learning Needs Analysis tool to assess teams' skills gaps and build a targeted training program to help close them, with completion validated by AWS Certification credentials. There are many other examples of existing upskilling options, so aligning employee incentives, and ensuring those are strong enough as well as agile and flexible by design, may be a more efficient and effective route than more direct forms of government action.

4.1.2 Adjust tax policy to incentivize applied AI R&D

Governments should also examine whether changes to tax policy can encourage faster uptake and diffusion of AI. Recent data from the OECD showed that 33 of 38 OECD member countries offered tax relief for companies that invested in R&D in 2023. That is double the number that offered such benefits in 2000, with SMEs tending to benefit more from tax relief in percentage terms than bigger firms.[33]

Unsurprisingly, these R&D tax breaks tend to be most effective at encouraging greater investment in more experimental development, rather than applied research. Meanwhile, investments in AI adoption, including investments to develop more practical AI applications that can make business processes more efficient, aren't eligible for the same relief.

Tweaking tax policy for AI to promote more applied innovation could stimulate more rapid AI diffusion. For example, current tax incentives in the US and some other OECD countries give companies tax credits for purchases of high-end semiconductors for use in training cutting-edge foundation models, while companies that spend money to fine-tune applications for specific industry use cases - i.e. those working to diffuse AI across specific sectors - are not eligible for similar tax breaks. Tweaking tax policy to allow companies to deduct expenses associated with fine-tuning or other investments in more applied AI could help spur greater adoption and accelerate progress towards unlocking productivity gains.

4.1.3 Invest in public sector AI to improve government services

Investing directly in public sector AI adoption can improve outcomes for citizens, relieve stresses and pressures on public sector workers, and stimulate demand for AI services. The opportunity to transform major public sector verticals such as education and healthcare is significant. In their October 2024 Ministerial Meeting on Technology and Digital, G7 leaders acknowledged these opportunities, recognizing "the importance of cloud computing and other tools for providing digital public services and fostering digital public infrastructure."[34]

In the UK, for instance, teachers that are using CENTURY, an AI-powered teaching assistant and tutoring system, are saving six hours a week, while outperforming national grade improvement by a factor of ten. In healthcare, NHS workers assess that time spent on bureaucracy could drop from 50 per cent to 30 per cent if generative AI was effectively implemented, saving one day of busywork per week.[35] Put another way, this would allow medical staff to spend an extra day per week caring for patients.

As a first step, the center of government should ensure that every department has a roadmap for AI adoption

[33] (OECD). "OECD R&D tax incentives database: Highlights from the April 2024 update". (April 2024)

[34] G7 Digital and Technology Ministers Joint Statement, 15 October 2024, Cernobbio-Como, Italy.

[35] Bright, Jonathan, Florence Enock, Saba Esnaashari, John Francis, Youmna Hashem, and Deborah Morgan. 'Generative AI is already widespread in the public sector: evidence from a survey of UK public sector professionals'. Digit. Gov.: Res. Pract. Just Accepted (October 2024).

- not just within central departments but also in collaboration with local services and authorities.

These roadmaps should be owned by the top official within each department, who can be held accountable by the center for the development and implementation of their roadmap in order to drive progress and prioritization.

The examples of Estonia and Singapore, though more equivalent to cities than nations in population size, can provide inspiration for how to do this effectively.

The Estonian government for example has implemented over 130 AI projects in the public sector, nearly double that of the UK.[36] Deployed use cases that range from fraud detection systems for robotaxis, to Bürokratt, a chatbot being developed as a 'single point of contact' online for personalized government support. Estonia has also adopted automatic transcriptions for court hearings and Parliament sessions, and transport robots in large hospitals, helping enable more regular sample deliveries between units for more accurate results.

In its latest AI strategy, the government articulated an ambitious vision for 2030, where "every individual has personalized digital assistants for education, mental health and other areas. Doctors, police and other professionals will have specialized assistants, optimizing human work while automating simpler tasks."

[36] National Audit Office. 'Use of artificial intelligence in government'. Department for Science, Innovation & Technology Report HC 612 (2024).

Singapore is another example of a smaller economy using limited resources to maximize AI's benefits for the public sector. Examples of new services rolled out using Singapore's mission-driven, 'pilot and scale' approach include an Adaptive Learning System in public education[37] and medical imaging in healthcare.[38]

Singapore's approach to digital public services includes setting specific, time-bound targets across priority sectors. It then sets pathways from pilots (with a test sample evaluation) to scale (making services generally available and providing mandatory training for public sector workers in how to use those services). It underpins this with robust project management and technical know-how. This includes paying closer to market rates for these specialist skills – an approach that the UK's new AI Safety Institute has also taken to attracting leading-edge AI talent through 'special expert allowances' for more competitive remuneration.

Beyond these leading small economies, other governments are likely to find numerous opportunities to apply commercially available AI-powered services to wring better efficiencies and improve the delivery of public services, following the lead of private sector companies that have already made major strides.

For example, Octopus Energy has increased the number of customer emails being answered by AI from 5 per cent in January 2024 to 45 per cent by May 2024, while increasing

[37] Lam, Nicole. 'MOE to deploy more AI in schools after success of Pri 5 maths tool'. MOE Today, 20 September 2023.

[38] Ang, Adam. 'Behind Singapore's widespread AI adoption in public health'. Healthcare IT News, 24 January 2024.

Figure 2: a typical GenAI Implementation Roadmap

customer satisfaction from 65 per cent (human-only emails) to 85 per cent (human with AI).[39] Applying AI to help support the public's interactions with public services is simultaneously one of the highest impact use cases and the lowest hanging pieces of fruit for public sector adopters.

Diffusion-centric policies should make policies supporting these industry-specific investments that can directly improve service outcomes, free up resources to reinvest in frontline public services, and relieve pressures in areas facing acute worker shortages a particular focus for public investment. Where solutions are available and already demonstrating results amongst existing adopters (for example amongst a subset of local governments, schools, or hospitals), governments can assist with scaling these up by providing funding, workforce upskilling initiatives, and tracking targets for adoption and uptake.

In the UK, the local government in Swindon, a town of 180,000 people two hours west of London, is working to make AI tools that it has used to improve residents' access to public services open-source and available for other local governments to use, license-free.[40] This includes releasing the prompts and parameters they have curated so that others in the public sector and civil society can customize them rather than starting from scratch. Government departments that lead networks of local services and authorities could boost diffusion by pursuing similar initiatives to promote knowledge transfer and help scale up local innovations to the national level:

Where pilot projects or proofs of concept are not available, governments can enable innovation in a coordinated sector-driven approach that applies the broad set of levers identified in this document, including procurement-led R&D, collaboration with universities and research institutions (including on data and compute), and developing its in-house capabilities.

By being direct purchasers of AI technologies, governments can not only improve public services but can kick start a virtuous cycle, in which delivering benefits for citizens increases overall trust in AI, eventually driving greater private-sector demand.

[39] All Together. 'Customer Service Evolved: Three Things From Octopus Energy's AI Integration', LinkedIn Pulse, 14 November 2023.

[40] Pena, Sarah. 'Swindon Borough Council makes vital public information more accessible using Amazon Bedrock'. AWS Public Sector Blog, 1 December 2023.

Swindon Borough Council: using AI to help meet accessibility needs

The Swindon case study shows how local governments can use cloud-based AI tools to make content more accessible for residents who have special needs, such as low literacy levels (1 in 5 UK citizens do not have high school level literacy), cognitive impairment, or learning difficulties (affecting 15 per cent of the global population). It typically costs public-service providers around $250 to transform a single page of content into an easy read format that is more easily accessible to these populations. Using software tooling available through Amazon Bedrock, Swindon Council has reduced that cost to around $0.10 per page. As the head of Swindon Council's digital initiatives notes, "cloud-based technology has enabled this service innovation. The cloud is a place where we can experiment and explore fast, securely, and at low cost. And our teams don't need to know Python or have a PhD in AI. We can simply focus on realizing our ideas for new service improvements."

4.1.4 Support work on technical standards to enable interoperability

Standards will become an increasingly important determinant for AI adoption, in part driven by the upcoming implementation of new regulations such as the EU AI Act. Regulation that provides a pathway to compliance via conformity with international technical standards is an essential step towards interoperability.

Governments should continue to prioritize cooperation on the adoption of international standards, and consider where they can support the development of standards that positively promote diffusion, including data.

In the context of AI to date, standards discussions have largely been framed around responsible AI and product safety. Traditionally, the adoption of common standards has also played a critical role in enabling wider diffusion and establishing well-functioning labor markets (and wage premiums) for technology-adjacent skills. A lack

of standardization, or the emergence of conflicting standards, can delay a technology's benefits for labor markets by decades. The work of James Bessen - in particular, Learning by Doing - provides essential insight into these effects.[41]

Bessen cites historical examples where a lack of standardization and interoperability dampened the value of worker skills and hampered the labor market. For example, differing keyboard layouts following the advent of the typewriter made it hard for workers to train and move jobs between companies that used different keyboard layouts. This only changed during the 1880s with the emergence of the standard QWERTY keyboard.

Government regulation of AI risks should therefore prioritize interoperability to prevent these market frictions and fragmentation. Technical standards have the potential to lower barriers to AI adoption by establishing common definitions and frameworks for managing AI risks, assessing system performance, and using AI in specific domains, such as healthcare or connected vehicles. Data and cybersecurity standards also have the potential to clear the way for faster AI adoption by providing a common reference point for companies working to apply AI to specific industry use cases.

4.2 Supply-side levers

"Supply-side" policy measures promote more rapid diffusion by supporting the wider technology industry that makes AI accessible. This consists of many companies operating at different layers of the stack, including foundation models developers, application developers, device-makers, enterprise software companies, cloud and edge computing infrastructure providers, semiconductor companies, and other digital infrastructure providers. These companies not only spur broader diffusion, they are economically important in their own right, providing high-paying jobs and acting as a key source of demand for the ICT sector. Fostering the supply side of AI will require governments to invest in a broad array of policies aimed at different layers of the AI stack.

4.2.1 Enable broader access to the cloud's AI tooling layer

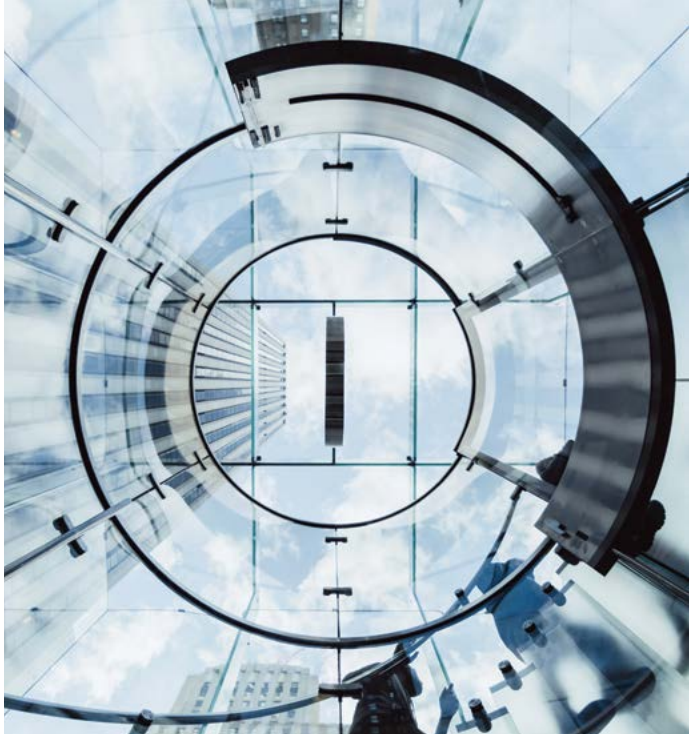
Several governments are working to expand access to large-scale advanced compute resources as part of their national AI strategies. This includes projects to build directly owned sovereign AI compute capacity (e.g. the US National AI Research Resource (NAIRR) and the EU's AI Factories initiative). While governments have several motives for these investments, a key factor is their desire to democratize access to cutting-edge AI research, as the cost of training cutting-edge AI models has grown exponentially along with model size.

While important for advancing the cutting edge of AI, and key to supporting the growth of foundation model-type AI companies (and the economic gains that come with them), these investments are unlikely to directly spark more rapid diffusion of AI that could accelerate realization of AI-driven productivity gains. A more diffusion-focused strategy would focus more on expanding access to the tooling layer of the cloud stack,

[41] Bessen, James. Learning by Doing: The Real Connection between Innovation, Wages, and Wealth. Yale University Press (2015).

Figure 3: Compute demands for advanced AI models have increased exponentially over time

Source: Stanford AI Index, 2024



which is what most businesses will use to build and run AI applications.

A recent OECD analysis of AI adopters in 11 countries found that access to the cloud played "a key role for AI use" and was "positively associated with AI (adoption)".[42] As mentioned above in the discussion of the AI tooling and applications layers of the cloud stack, access to cloud computing for AI provides many advantages, including enhanced security, scalability and agility, energy efficiency, cost savings (removing the need for upfront capital investment), and, increasingly, easier compliance with emerging best practices and AI safety regulations through compliance by design incorporated into these tools. Cloud access also offers a graduated pathway for a business' journey to digital maturity, from basic adoption (e.g. storage), to intermediate (e.g. off-the-shelf tools with intuitive interfaces), to advanced (e.g. cutting-edge technologies tailored for expert tasks).

Governments that want to encourage more rapid diffusion should consider policies for subsidizing cloud access for startups and companies in sectors that are lagging in AI adoption. Singapore's Digital Enterprise Blueprint, which provides subsidized access to cloud computing resources for low digital maturity businesses for 12 months, could be a model for other countries to build on.

Government support for cloud access should not be limited to the companies directly accessing the cloud compute infrastructure layers. While these companies are an important source of technology breakthroughs, governments should consider offering similar support to help a wider array of companies in target sectors access the tooling and applications layers of the stack. This again reflects the idea that cutting-edge R&D alone is not sufficient to ensure diffusion and adoption of AI, and that applied innovation is crucial.

4.2.2 Connect AI R&D spending to priority sectors

Directing support for government AI R&D spending towards specific industry verticals, where fine-tuning may help advance work on new AI applications that aren't currently available off the shelf (low Si scores, in the sector ranking framework described above) could help support more rapid uptake and diffusion. This kind of targeted policy could be combined with the cloud computing credits described above to further incentivize work on applied problems that could lead to greater uptake of AI applications in specific industry contexts.

Efforts to better target research spending to promote diffusion could include driving innovation through procurement-driven R&D. As noted by the economist James Bessen, procurement-driven R&D by the U.S. government has had a long history in crossing the 'valley of death' from research to deployment and creating wider positive spillovers, spanning from the U.S. army's use of interchangeable parts for military technologies stimulating a broader industrial revolution to Operation Warp Speed in our present era. [43]

Supporting cross-disciplinary research, including allowing researchers in fields like medicine or energy to access AI R&D funding for applied AI projects in their subject-matter verticals, could also help speed adoption of practical AI solutions in these sectors. Establishing cross-disciplinary centers of excellence, coordinating efforts on access to cloud computing resources, and securing access to domain-specific data sets can all support both earlier-stage research and more practical advances in these areas.

4.2.3 Support trustworthy access to data

A diffusion-centric approach to AI adoption would focus data policies on identifying and encouraging

[42] Calvino, Flavio and Luca Fontanelli. "A portrait of AI adopters across countries: Firm characteristics, assets' complementarities and productivity", OECD Science, Technology and Industry Working Papers, No. 2023/02, OECD Publishing, Paris (2023).

[43] Bessen, James. Learning by Doing: The Real Connection between Innovation, Wages, and Wealth. Yale University Press (2015).

access to more domain-specific data sets that are useful for fine-tuning models for specific applications.

Fine-tuning is an example of an applied AI technique that improves the performance and reliability of AI applications, by training them on a subset of domain or use-case specific data. Other techniques to improve AI system reliability, such as retrieval-augmented generation (RAG), which combines generative AI models with proprietary data to reduce hallucinations and improve the reliability of system performance at specific tasks, will also rely on data becoming more widely accessible and easy for organizations of very degrees of sophistication to organize and use.

AI agents, which are AI systems that can engage in multi-step problem solving, including retrieving data from a variety of sources using function-calling, will also need secure and reliable access to different types of data to function effectively. Government policies that foster trustworthy access to data while maintaining high levels of data security and respecting privacy will be critical for these technologies to diffuse widely across the economy.

Organizations aiming to maximize the full value of AI technologies will need a strong underlying data architecture. For example, operational databases are needed to support the user experience for all interaction steps outside invoking the LLM itself. Analytics and data lakes play an important role in accumulating domain-specific data and helping organizations understand how to leverage it in generative AI. Data integrations are likewise needed to keep up with changes in data, while sound governance processes help ensure data quality, privacy and compliance to privacy, security and access controls.

Half of respondents to a 2024 MIT survey cite data quality as a major limitation for AI deployment, impacting both large and small adopters.[44] Access to quality data can help an AI model adapt to domain-specific language, enhance performance for specific tasks, and improve context-awareness in responses. There are many dimensions to quality data within the data-for-AI lifecycle, including: labeling, annotation, volume, diversity, fairness, accuracy, relevance, privacy and confidentiality, security, integration, and comprehensiveness.

The UK National Health Service's data assets are often cited for their potential to drive AI innovation for the health sector. As Jess Morley - a former adviser on AI at the NHS - notes, however, there are several barriers to assembling high-quality data that is useful for AI.[45] These include siloed databases, errors and omissions in datasets that were originally compiled without AI training in mind, and a lack of interoperability between systems. In practice, doctors frequently must log in and out of multiple systems to manage patient care and record and label data.

In potentially sensitive domains such as healthcare, governments should also consider frameworks for trustworthy open data access to accelerate innovation, known as "data institutions."[46] These can take different forms, as outlined by the Open Data Institute, from the UK Biobank, a government-funded body that stores genetic data for research purposes, to Social Science One, which facilitates secure access to data for academics. Such initiatives enable AI innovation across both private sector and public sector by allowing researchers and practitioners to make use of valuable data in a secure and trustworthy way.

In healthcare, Taiwan's public sector Health Passbook is an example of a data institution that has helped build trust to enable personal data access.[47] The Passbook establishes a three-way model for managing data access between the state, data subjects and private sector AI companies, with the government acting as a facilitator.

There is a growing recognition among governments of the need to support data infrastructure to promote public sector AI adoption. The OECD's October 2024 "G7 Toolkit for Artificial Intelligence in the Public Sector" sets priorities around improving this data infrastructure by improving AI compute capacity, creating secure data access frameworks, and establishing frameworks for AI testing, experimentation, and infrastructure support.[48]

[44] MIT Technology Review Insights 'A playbook for crafting AI strategy'. MIT Technology Review 5 August 2024.

[45] Morley, Jessica. 'AI and the NHS: is it the silver bullet that will improve the health service's productivity?' Nuffield Trust Blog Post, 15 August 2024

[46] Hardinges, Jack and Jared Robert Keller. 'What are data institutions and why are they important?' Open Data Institute, 19 January 2021.

[47] Liu, Ching-Yi and Jhalak Kakkar. 'The role of government as a provider of data for AI.' Global Partnership on AI Report (May 2024).

[48] OECD/UNESCO, G7 Toolkit for Artificial Intelligence in the Public Sector, OECD Publishing, Paris (2024).

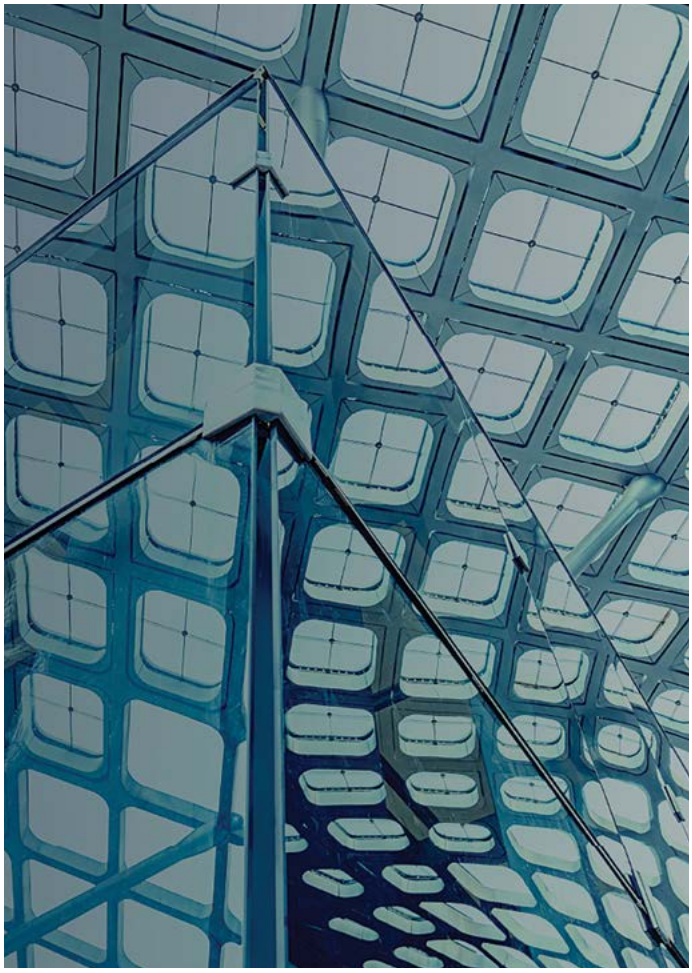
As of December 2022, more than 30,000 Health Passport users have transferred health data to support third party data-driven applications.

4.2.4 Adopt targeted, proportionate and interoperable regulation

As efforts to establish regulatory guardrails around AI have intensified in recent years, governments have been wrestling with how to promote more rapid adoption while also ensuring that AI is developed in a safe and responsible manner. While national approaches differ, G7/G20 countries have acknowledged a need to enhance interoperability between regulatory regimes to promote both trade and the scaling of responsible AI practices.

International collaboration on interoperability and standards will build trust, reduce technological fragmentation, and accelerate the transferability of workers' skills and knowledge, which is key for improving workers' incomes.[49] Cooperation on international standards can help expand the potential user base for AI and (alongside other initiatives such as investing in the local talent base) attract global investment into a local sector.

The UK has pursued a sector-specific, risk-based approach to AI regulation, focused initially on enabling regulatory innovation on autonomous vehicles.[50] (with a framework that has enabled the UK to become the first country in Europe to approve hands-free driving technology) and fintech [51] (where regulatory sandboxes increased capital raised by industry participants by 15 per cent). The UK has built on this approach with its recently published AI White Paper response, including: appointment of a nominal AI minister in every ministry, £10m to support sector regulators in upskilling, a series of sectoral reviews delivered in Spring 2024, and a central AI Directorate set to reach 270 headcount in 2024.[52]



In forums such as the G7, Governments should build on these efforts by (1) promoting dialogue between sector regulators in priority industries, including sharing of best practices and strategic assessments; and (2) establishing joint roadmaps on standards development and adoption, to promote interoperability between regulatory regimes.

[49] Bessen, James. Learning by Doing: The Real Connection between Innovation, Wages, and Wealth. Yale University Press (2015).

[50] Maguire, Sarah. 'Self-driving Ford car granted approval for hands-free use on British motorways in European first'. Sky News, 14 April 2023.

[51] Cornelli, Giulio, Sebastian Doerr, Leonardo Gambacorta and Ouarda Merrouche. 'Regulatory sandboxes and fintech funding: evidence from the UK'. BIS Working Papers 901 (April 2023).

[52] Department for Science, Innovation & Technology 'A pro-innovation approach to AI regulation: government response'. DSIT Command Paper: CP 1019 (February 2024).

Taiwan's Health Passbook

Taiwan's Health Passbook integrates detailed healthcare records to help give users more personalized healthcare. Users determine the scope and use of their data by verified third-party applicants. They can also give consent for their data to be used in research and development for AI healthcare technology, or to specific third parties. The government's role is to keep user's data secure on the Health Passbook's server.

5. Questions for further discussion

Canada launched the world's first national AI strategy less than a decade ago, in 2017. Many other countries have since followed suit, with different policy approaches. This provides us with valuable insights and empirical grounding to analyze what's worked well, and what hasn't. There is also significantly more evidence available today on the benefits of AI, and its potential for the future. As this initial survey has highlighted, there are a wide range of promising policies that have the potential to support more rapid diffusion of AI across the economy, and numerous examples of pro-diffusion policies that are already delivering results that other countries can learn from and adapt to their unique circumstances.

We anticipate that the skills agenda will remain a decisive factor for success in AI adoption, with a growing emphasis on how on-the-job, flexible training options can support workers in developing their AI-adjacent competencies.

Infrastructure - in particular energy and water utilities - is also rapidly becoming a more urgent consideration for policymakers seeking to leverage AI's economic benefits. If the cost of energy is significantly higher in a given region compared to others, then this will have a knock-on impact on the cost of inference (i.e. the routine performance of a task by an AI system) and - by extension - the cost of AI adoption. Energy is set to become an increasingly complementary technology for widespread AI adoption - and therefore a core consideration for forward-looking industrial strategies on AI. However, analysis of AI adoption policy remains limited by what we still don't know. For example, it is not clear how far improvements in accessibility and user experience design of AI systems may continue to lower barriers to adoption and diffusion, mirroring how successive consumer device innovations helped lift internet penetration, and how this may shift user needs.

We also lack a comprehensive cross-country analysis and dataset for AI adoption and diffusion, as for example in the Dais Institute's work on Canada.[53] A broader data gathering exercise by national statistics agencies, leveraging the OECD's Model ICT Usage Survey and applying regression analysis techniques across several countries, could provide some more illuminating findings and recommendations for policymakers.

In addition to these considerations, further exploration in the following areas would be beneficial:

- The development of a framework for governments to identify priority sectors
- A framework for identifying high-priority, high impact use cases for improved public service delivery, with implementation guidance (including the establishment/ design of data institutions where relevant).
- A strategic policy response to the intersection of industrial policy / national infrastructure objectives on energy and AI.
- A detailed breakdown of target profile cohorts for planning effective national upskilling / reskilling initiatives for an 'AI-ready' workforce. This would account for a range of 'worker profiles' e.g. the spectrum of AI literacy levels (from advanced developer through to beginner user), levels of AI job penetration by task, job roles (e.g. strategic decision maker or operational), demographics, and sectors.
- The complementarity between public and private investment into AI that can help governments optimize their approach to enable a 'virtuous circle' between the two forms of investment.
- Evaluation of emerging 'access to compute' policies – a relatively new area of industrial policy for AI – to optimize support for start-ups, academia, and public sector. This should consider the role of cloud partnerships more broadly in developing socially beneficial use cases.
- The potential scope and impact for trade agreements to elevate adoption rates, in the context of an increasingly complex regulatory landscape and the clear incentive that the size of combined opportunities represents.

We look forward to exploring these prospective research areas to ensure that policymakers are equipped with the best evidence base for realizing the potential of AI for their economies.

[53] Lockhart, Angus. 'Automation Nation? AI Adoption in Canadian Businesses', The Dais (2023).

AIAI
THE AI ADOPTION INITIATIVE

www.adopt-ai.org

Conclusion

The AI revolution coincides with a period in our global history where dramatic productivity gains have never been more important. Demographic pressures, climate change, and other urgent global challenges mean that capitalizing on AI's productive potential may be critical for sustaining and improving economic opportunities and wellbeing for populations around the globe. Understanding the drivers of AI adoption and diffusion should be a top priority for policymakers, the private sector, and civil society. We look forward to continuing to work with you and other stakeholders on this challenge.

Acknowledgements
This paper was authored by Marc-Etienne Ouimette, Edward Teather, and Kevin Allison, with substantive contributions and support from Conor McGlynn and Pablo Chavez.

The authors thank the following people for feedback and discussion of earlier drafts of the paper: Sue Daley, Cameron Kerry, Joshua Meltzer, Tom Westgarth, Mark Hazelden, and Angus Lockhart.

Design & layout
Rachel Steele www.steeleydesign.com

AIAI

THE AI ADOPTION INITIATIVE

AI, EVERYWHERE, ALL AT ONCE

A new policy agenda for AI success through faster adoption

Our findings and report following the AI Adoption Workshop in NYC on 20 November 2024

Contents

1. Executive summary

On November 20, 2024, over sixty leading experts from around the world met in New York to discuss ideas for a new policy agenda for encouraging faster and broader adoption of artificial intelligence (AI) technologies.

Inspired in part by the work of Jeffrey Ding, the author of 'Technology and the Rise of Great Powers: How Diffusion Shapes Economic Competition', the workshop built on suggestions set out in the 'AI, Everywhere, All At Once: A New Policy Agenda for AI Success Through Faster Adoption' paper.

As the workshop hosts, AWS and Minerva Technology Policy Advisors convened conversations on overcoming the obstacles to adoption, and what an adoption-focused national policy for AI may look like. Throughout the workshop, the group of experts identified current and emerging challenges, considered a variety of different sectoral approaches to AI adoption, made specific policy proposals for both private and public sector bodies, and posed questions for further investigation. This paper summarizes the ideas and insights surfaced by workshop participants and highlights questions for further study.

.

2. Policy changes posed by adoption

2.1 Overview

An adoption-centric policy agenda needs to recognize that AI technologies are not monolithic, but instead break down into many different layers and applications, each with their own sectoral and domain specific nuance.

Policy must also distinguish "frontier" systems from those that support "out-of-the-box" uses; those that require other technical integrations from solutions that can be applied without technical expertise; and the many "traditional" AI applications that predate generative capabilities from large language models (LLMs). The development of more adoption-centric policies will involve paying specific attention to AI as a general-purpose technology that can reach all corners of the market and economy, everywhere, all at once.

Participants agreed that this shift will require rethinking the ways in which policy can promote and enable use; de-risking experimentation in enterprise, rather than just in 'laboratory' settings; and considering the different incentives at play for businesses of various scales, and from different geographies

2.2 Policy ideas

Create a new venue for connectivity between business, academia and government: creating adoptioncentric venues in which academia, government bodies and private sector organizations can learn from one another, with an emphasis on promoting use of applications that do not necessarily require cutting-edge research capabilities or represent "frontier" systems.

Develop an enterprise sandbox, a secure environment for testing software without impacting live systems or data: building experimental architectures that allow businesses to de-risk and reduce the financial costs of adoption of well-understood and proven tooling, to accelerate their adoption and use of AI while building industrial confidence. This could involve, for example, a similar model to the Malaysian government's Ministry of Science, Technology, and Innovation (MOSTI)'s AI Sandbox 2024 Pilot Programme that aims to create 900 AI startups by 2026.

2.3 Unresolved questions

- What role can companies, or coalitions of companies, play in helping policy makers to distinguish between different applications as "frontier" systems versus "out-of-the-box" applications that are more robustly understood and predictable?
- What are the methods for educating policymakers about differential targeting of applications with appropriate, adoption-centric policy, especially throughout the full stack of capabilities that support different forms of AI?
- Can robust, adoption-centric policy translate from one national or economic context to another?

3. The role for public policy in encouraging faster adoption

3.1 Overview

A number of market failures stand in the way of more rapid and robust adoption of artificial intelligence including bureaucratic inertia, institutional challenges, skill shortages, and coordination problems. Among the barriers are concerns about capacity for upskilling and talent retention, a lack of information about the specific skills required for adoption, and challenges accessing compute capabilities, software and data resources. Government policy can play a useful role in helping lower these barriers, particularly where these problems stem from market failures.

Participants agreed that there are clear areas across industries where public policy can play a useful role in adoption, particularly in enabling companies to identify sectors that could represent "low-hanging fruit" for adoption in identifying practitioners with relevant skills, and in making sector-specific data available in laggard industries, as has been done for public agencies by Analytics.gov (AG), built by the Government Technology Agency of Singapore, for example. There was general agreement that the credibility of governments going forward will be shaped by how well they address these market failures to encourage adoption of artificial intelligence.

3.2 Policy ideas

Develop a framework of standardized skill taxonomies: harmonizing a shared reference point for skills requirements, qualifications and indicative capabilities that align with adoption of artificial intelligence.

Encourage standardized tools for measuring AI adoption across jurisdictions and geographies: to target adoption, organizations must be able to measure differential rates of use and penetration between countries more easily (e.g. adoption of the OECD Model ICT Usage Survey) to ensure sampling is representative (i.e. by national statistics agencies). Governments, through international forums such as the G7 and G20, should invest in developing adoption metrics that can be applied in both the private and public sectors to identify laggard industries and departments.

Promote the creation and accessibility of "AI-ready" data: to correct failures stemming from a lack of data through policies that encourage responsible collection, management, and use of a wider array of data types and sources, with support for harmonizing, cleaning and annotating; including data sourced from government agencies.

3.3 Unresolved questions

- Given the specific challenges of talent retention, how can companies be incentivized to invest in training practitioners?
- What role can stakeholders play in building a consensus taxonomy of "AI-ready" skills that are crucial to promoting adoption in different industries and across different types of economies?

4. Workforce and skills requirements

4.1 Overview

AI adoption throughout the economy depends upon a broad base of skilled workers that can solve the challenges of integration, use, and continued iteration. By promoting a "build it and they will learn" approach to workforce and skills development, policymakers can encourage more rapid adoption of artificial intelligence. This could include ensuring that educational schemes are layered with connections to industry bodies, and increasing the level of free, flexible learning resources.

Participants at the workshop discussed the critical need for robust measurement of productivity gains from adoption of AI in pilot cases, to provide incentives for further use in industries, adjacent or otherwise. By demonstrating the value of initial cases, other companies and entire sectors can be encouraged to invest in training and hiring practitioners. The challenge of "brain drain" from economies that have historically faced out-migration of skilled workers, including AI specialists, could be mitigated by subsidies, deeper public-private sector partnerships and access to novel technical challenges and contexts like climate modelling, infrastructure, and new energy systems. Tax credits, grants, community colleges and other educational institutions could all be aligned with the promotion of broad-based skills acquisition relevant to adoption; in product management, operational analysis, modelling and statistics.

4.2 Policy ideas

Incorporate training in adoption-centric skills taxonomies in education: to ensure that more school-age students get an initial education in the "AI-ready" skill set that supports adoption, with the opportunity to deepen it through community college degrees and university programs.

Conduct an audit of existing "AI-readiness" training programs: auditing at a national level to assess the need for additions that are enterprise-relevant and identify where more opportunities could be supported by grants, tax credits and other schemes. This audit should take into account the full roadmap for industry-specific skills, and map out supplementary measures related to occupations with high exposure to automation and public-private partnership programmes, like The Ministry of Electronics & Information Technology's FutureSkills Prime in India, for example.

Incentivize employers to participate in skills programmes: by presenting the acquisition of adoption-centric skills as an "insurance policy" for businesses.

Incentivize AI Skills Training: employers should incentivize employees to participate in AI skills training by framing it as an "insurance policy" for career growth and security. Additionally, firms should prioritize internal training programs that empower workers to use AI tools effectively in their roles.

4.3 Unresolved questions

- How to measure the tipping point for AI adoption and its impact on the workforce? How do we create disaggregated measures at the firm level?
- How can stakeholders' de-risk the process of training practitioners for adoption, given the risk of "brain drain" and human capital flight?
- How to address the tension between creating general skills and complementary skills that are contextual and not cross-transferable?
- How to foster skills for faster adoption in sectors where industry-specific tacit knowledge plays an important role in innovation and business processes, such as manufacturing automation and semiconductors?
- Is AI skills training an extension of typical digital skills training or does it require a unique approach?
- Will widespread AI adoption drive skills development ("build it, and they will learn"), or must skills development precede adoption?

5. The need for data and functional standards

5.1 Overview

The discussion on data and standards focused on how governments can target policies and standards towards adoption by small and mid-sized companies. There was consensus that governments should explore how national data strategies can be leveraged to convene stakeholders and define principles for data use. There also needs to be practical implementation of data legislation, with a particular focus on SMEs, and avoiding the benefits solely accruing to large companies. Considering the needs of smaller companies is also important when developing national AI standards strategies to promote interoperability and interaction across sectors. Another strand of the discussion focused on how to make use of the high-quality data that exists within governments, which is often untapped. The value of this data is in a sense being "left in the ground," and could be responsibly put to work in the public interest (for example Taiwan's National Health Insurance Integrated Circuit card).

5.2 Policy ideas

Develop a framework of standardized skill taxonomies: Tap into latent, underutilized reserves of government data: this can help generate significant public welfare by making the provision of government services more efficient.

Support the creation of "data lakes": data lakes are centralized repositories that allow you to store all your structured and unstructured data at any scale. This would help improve access to high quality, sectorspecific data.

Support a basic-level standard for AI management: similar to the Cyber Essentials standard, this would make adoption more achievable for small and medium-sized enterprises.

Address the challenges of data sharing: develop strategies to navigate tensions around privacy, consent, geopolitical agendas, and national security to unlock the benefits of responsible and secure data sharing.

Leverage national data strategies: explore how national data strategies can convene stakeholders and establish principles for responsible and effective data use.

Identify innovative consent mechanisms: identify alternative approaches to consent that enable data acquisition and use for public interest purposes while maintaining individual rights and trust.

5.3 Unresolved questions

- How to balance concerns about data consent with the goal of unlocking public value in accessible data?
- How to develop standards to address public concerns around the responsible use of public data?

6. Sector case studies

6.1 Overview

When addressing AI adoption challenges, different sectors may encounter unique obstacles, requiring tailored strategies to effectively navigate them. As such, the workshop included a panel discussion that unpacked how innovative organizations are deploying AI to transform their products and services and their business operations. The discussion covered sectors ranging from banking, to cybersecurity, to clean energy, with speakers highlighting obstacles in Latin America with legal frameworks and talent shortages, AI's dual role in cybersecurity, AI integration in education globally, and the financial services' AI use in fraud detection and regulatory challenges. Overall, the panel agreed on the need for government playbooks and public-private partnerships and the importance of tailored policies and effective regulation to foster AI adoption across sectors.

6.2 Policy ideas

Create "playbooks" or "blueprints" to de-risk adoption for small and medium-sized companies: these should be grounded in best practices, to guide SMEs in effectively adopting and integrating AI technologies, addressing challenges such as cost, workforce readiness, and data management.

Strengthen the role of sector regulators in influencing AI adoption: this includes strategies to enhance regulatory capacity and that promote effective information sharing.

Prioritize ensuring legal certainty for companies to foster innovation: where regulation of more applied uses of AI is needed, ensure it includes a clear and predictable legal framework that enables businesses to confidently invest in and adopt AI technologies. This approach should strike a balance, ensuring that regulations do not overburden companies, which could stifle innovation and delay the development of AI solutions. By providing legal clarity, regulators can reduce uncertainty and create an environment conducive to technological progress while protecting public interests.

Further development in public-private partnerships: this can include approaches similar to the Veritas program in Singapore, a national cybersecurity initiative that focuses on developing and enhancing the capabilities of cybersecurity professionals through a combination of hands-on training, advanced tools, and real-world threat simulations. A similar approach and partnership between the public and private sectors can be taken to help spur responsible AI adoption in key sectors.

Establishment of clear and tailored metrics for assessing AI-related skills: in order to accurately assess the success of AI adoption and impact, sector-specific metrics must be established to ensure relevance to the unique needs and challenges of each industry.

Identify and implement a balanced mix of sector-specific and cross-cutting policies to accelerate AI adoption effectively across diverse industries.

Enhancing Public-Private Collaboration for AI Innovation: establishing and maintaining robust communication channels between government entities and diverse industry sectors is essential for fostering trust, aligning priorities, and driving AI adoption.

6.3 Unresolved questions

- What unique factors does each sector require to accelerate AI adoption, and are there overarching policies that governments could implement to broadly support AI adoption across most, if not all, sectors?
- How does the regulatory environment impact AI adoption, and what role do investment in talent and data architecture play in addressing these challenges?
- What types of communication channels between government bodies and various industry sectors are most effective?
- What are sector-specific interventions to address the unique challenges of each industry?
- How to effectively measure specific AI skills across different industries?

7. Trade and investment

7.1 Overview

Despite headwinds to trade and investment, participants agreed that it is imperative to find ways to keep international flows of goods and services intact. There are limits to the idea of AI sovereignty when most countries will be unable to afford to rely on domestic compute and when no one country controls the supply chain. Trade fragmentation may also lead to standards fragmentation, which will drive up the cost of adoption.

While participants recognized the importance of bilateral agreements, they agreed that countries must not lose sight of the opportunities that continue to exist for cooperation through more inclusive partnerships. There remains space for pragmatic deals to be made, and policymakers should not underestimate the potential for economic self-interest to overcome protectionist rhetoric. Countries should start small, show mutual agreement on issues of core concern, and build trust gradually.

7.2 Policy ideas

Small-scale trade and AI agreements between like-minded countries: piloting small-scale trade and AI agreements with countries that share common aims.

Convening informal discussions and summits: in order to get around barriers to multilateral cooperation, informal convenings offer a pragmatic way to foster dialogue and trust in a less rigid, non-binding setting. By leveraging the informal convening power of summits, stakeholders can address complex issues and explore collaborative solutions outside formal diplomatic constraints.

Look for models in places where broad cooperation and representation is continuing: for example, international standards organizations have a long track record of merit-based, consensus-driven collaboration on standards across highly technical fields (e.g. in ISO/IEC's JTC1/SC 42 workstream on AI standards) and could be a model for other types of engagement.

Bilateral research agreements and "sister city" partnerships: establishing bilateral research agreements and leveraging the existing model of sister city partnerships to foster international collaboration on AI diffusion can enhance global cooperation on AI-driven solutions for shared challenges. These partnerships would facilitate joint research funding, knowledge exchange, and the creation of shared data repositories and AI governance frameworks. Through collaborative pilot programs in cities, these initiatives can build technical capacity, promote the responsible deployment of AI technologies, and harmonize global standards, contributing to equitable and sustainable AI development worldwide.

7.3 Unresolved questions

- How can companies and governments work to build trust in common standards to prevent fragmentation?

- How will US government agencies resolve their conflicting roles in controlling technology outward flow and promoting foreign direct investment (FDI) inward?

8. Lowering the cost of AI

8.1 Overview

Another significant barrier to AI adoption, particularly for SMEs, is the financial burden of investing in the technology and upskilling employees. The workshop discussion highlighted how governments can approach reducing AI adoption costs, particularly for SMEs. It also addressed the importance of overcoming information barriers, compliance costs, and opportunities for government intervention to lower costs through tax incentives, VAT exemptions for cloud and AI services, and regulatory support.

During the discussion, participants noted that effective AI policy focused on managing input costs is closely aligned with sound energy policy, as both contribute to reducing the cost of training and deploying AI applications. While current energy debates around AI largely center on demand management, the discussion underscored the critical importance of unlocking supply in complementary technologies (e.g. small modular reactors) and energy planning/market reforms (e.g. zonal pricing in the case of the UK as opposed to marginal cost pricing).

8.2 Policy ideas

Offer tax incentives or credits to companies investing in fine-tuning and applying pre-existing AI models: expand the scope of these financial supports beyond core AI research to accelerate innovation and encourage practical deployment in diverse industries.

"Sandboxes" for small and medium-sized enterprises (SMEs): creating dedicated 'sandbox' environments for SMEs will allow them to pilot AI solutions in a controlled, low-risk setting with minimal upfront costs. This will enable SMEs to innovate and experiment with AI technologies, fostering growth and competitiveness while mitigating financial barriers and regulatory uncertainties.

Guidance to help SMEs adopt AI technologies effectively: this can consist of accessible AI toolkits, clear implementation guidelines, and initiatives such as Singapore's "borrow a CTO" program which enables SMEs to access affordable AI expertise through partnerships with NGOs offering services like CTO-as-a-Service. This approach can help SMEs bridge the expertise gap, ensuring smoother AI integration and fostering innovation.

Support export finance guarantees to help SMEs take on the risk of AI adoption: this can help facilitate international expansion and competitiveness, allowing SMEs to scale AI adoption while safeguarding their financial stability and encouraging global market participation.

Reduce VAT and other taxes on cloud services and software-as-a-service (SaaS): this policy would enhance accessibility to essential digital tools, driving innovation and improving efficiency, especially for startups and SMEs that rely on these services to scale and compete in the global market.

Address the knowledge and awareness gaps that hinder SMEs from adopting AI technologies: this can be done by providing targeted educational initiatives and accessible resources, helping to demystify AI, dispel misconceptions about high costs, and empower SMEs to harness AI's transformative potential, driving innovation and increasing their competitiveness in the market.

8.3 Unresolved questions

- What are opportunities for the government to lead by example, using AI in its own operations and services to drive broader adoption?
- How can governments effectively address market failures and coordination challenges to accelerate progress, particularly in enabling small businesses to take risks and explore new opportunities?
- What are opportunities for public-private partnerships or centralized AI solutions that can be leveraged by multiple companies, especially in specific industry verticals?
- What are the overlaps between existing energy policy and potential AI adoption policies? What can we learn from government actions that clear out hurdles that bog down energy projects?
- What is the potential cost to governments if they don't intervene in lowering the costs of AI?

9. Public sector adoption

9.1 Overview

A final key highlight from the workshop was a discussion focused on public sector AI adoption, highlighting Estonia's digital nomad visa and Singapore's high public service wages and the potential for other governments to scale similar policies. The conversation emphasized the need for talent attraction, suggesting programs like the U.S. Department of Defense's Highly Qualified Experts initiative to help place high-skilled workers into public service. Participants highlighted the role of universities in AI education and public-private partnerships, with a call for government incentives to support these initiatives.

Furthermore, participants debated whether governments should consider centralized or decentralized approaches to boost adoption within government, ultimately concluding that both approaches are needed. Lastly, the discussion emphasized the importance of procurement flexibility and regulatory innovation.

9.2 Policy ideas

Establish a centralized "AI Success Database": such a database should document and share positive case studies of AI adoption in the public sector.

Explore further opportunities for government adoption of AI: review current procurement and authorization processes to identify opportunities for increased flexibility and scalability in applying AI solutions across government agencies.

Combine decentralized and centralized solutions: governments should implement a balanced strategy that combines decentralized, user-centered solutions with centralized mechanisms. Central entities should focus on coordinating contract vehicles, licensing, and procurement pilots, while systematically observing and sharing successes from pilot programs. This approach should also identify and scale effective regulatory innovations to ensure adaptable and impactful policy outcomes.

Implement flexible hiring programs: this includes initiatives such as digital nomad visa like those pioneered by Estonia and Singapore, alongside other tailored adjustments to personnel systems. These programs should be strategically designed to attract top-tier talent and highlight the public sector's unique missiondriven value to inspire long-term public service commitment.

Increased government engagement: governments should improve and strengthen engagement with commercial talent by signaling openness to innovative private-sector solutions and streamlining procurement processes to attract top talent into public service.

Harmonize procurement mechanisms across allied nations: this enables companies to collaborate seamlessly across borders without navigating redundant or conflicting requirements.

9.3 Unresolved questions

- How can policies that generated success in smaller countries, such as the digital nomad visas in Estonia and Singapore, be scaled in larger markets?
- What other incentives, beyond financial, can governments use to encourage public-private partnerships between industry, academia, and the public sector?
- How can state actors most effectively organize their in-house capabilities for best impact?

10. Acknowledgements

Amazon Web Services and Minerva Technology Policy Advisors would like to thank the participants of the November 20th AI adoption workshop in New York City for their valuable contributions to the workshop:

Robert Asselin
Business Council of Canada

Ray Eitel-Porter
Accenture

Mathieu Marcotte
Montreal International Center of Expertise in Artificial Intelligence (CEIMIA)

Jacqueline Barrett
The Bright Arc

Janet Egan
Center for a New American Security

Brett Meeks
Health Innovation Alliance

Karim Bardeesy
Dais Institute

Aliki Foinikopoulou
Salesforce

Josh Meltzer
Brookings Institute

Gabe Batstone
Contextere

Max Fenkell
Scale AI

Ben Moscovitch
Amazon Web Services

Martin Beyries
Amazon Web Services

Sabine Gerdon
Amazon Web Services

Victor Muñoz
Argia

Bridget Boakye
Tony Blair Institute for Global Change

Luke Gbedemah
Evident AI/Minerva

Elaine Newton
Amazon Web Services

Piero Boccardo
Politecnico di Torino

Melissa Griffith
Johns Hopkins University School of Advanced International Studies (SAIS)

Kir Nuthi
The Startup Coalition

Austin Carson
SeedAI

Sarah Hammer
The Wharton School, UPENN

Matthias Oschinski
Center for Security and Emerging Technology

Christophe Carugati
Digital Competition

Stephanie Ifayemi
Partnership on AI

Julia Pomares
GIDE Latin America

Greg Cannon
Amazon Web Services

Olivia Igbokwe
Amazon Web Services

Emelia Probasco
Center for Security and Emerging Technology

Silvana Castano
University of Milan

Matthew Johnson
Educational Testing Service (ETS)

Vladyslav Sadilov
Università Bocconi

Pavan Chima
Amazon Web Services

Odis Johnson
Educational Testing Service (ETS)

Ronak Shah
Cassels Brock & Blackwell LLP

Christophe Combemale
Carnegie Mellon University

Raul Katz
Columbia University

Alex Steinhouse
Fasken

César Contreras
Centro México Digital

David Lametti
Fasken

Jed Sundwall
Radiant Earth

Matt Cronin
Andreessen Horowitz

Gary Litman
U.S. Chamber of Commerce

Audre Verseckaite
techUK

Marco Degli Esposti
Università degli Studi di Firenze

Hadas Lorber
AmCham Israel

Paolo Zambon
Amazon Web Services

Jeffrey Ding
George Washington University

Angus Lockhart
Dais Institute

Yasemin Yucel Karasu
Ingram Micro and Istinye University

Daniel Dobrygowski
World Economic Forum

Ben Lyons
Darktrace

Ceren Zeytinoglu
Başlangıç Noktası | Be Node

AIAI

THE AI ADOPTION INITIATIVE

www.adopt-ai.org