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INTERNATIONAL EXPERIENCE IN APPLYING ARTIFICIAL INTELLIGENCE IN THE ECONOMIC AND MANAGEMENT SECTORS: CASE STUDIES OF THE USA, SINGAPORE, SOUTH KOREA, AND ESTONIA

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Abstract
Artificial intelligence (AI) has rapidly evolved from a narrow research field into a general-purpose technology reshaping productivity, competitiveness, and the organization of public administration. This article examines the international experience of applying AI in the economic and management sectors through four distinctive case studies: the United States, Singapore, South Korea, and Estonia. Each of these economies has pursued a different model of AI deployment, reflecting its size, industrial structure, administrative tradition, and strategic priorities. The United States represents a market-driven, private-sector-led ecosystem with the deepest pool of capital and frontier research. Singapore illustrates a compact, centrally orchestrated "whole-of-economy" strategy anchored in strong governance and talent cultivation. South Korea has anchored its approach in industrial AI, using manufacturing transformation and sovereign computing capacity to offset demographic decline. Estonia exemplifies the full integration of AI into e-government and public-service delivery, building on more than two decades of digital statehood. The article compares policy frameworks, flagship initiatives, adoption indicators, and governance arrangements, and draws conclusions relevant to other economies seeking to harness AI for sustainable growth and public-sector modernization.

Introduction

Over the past decade, and especially since the public release of large-scale generative models in late 2022, artificial intelligence has moved from the periphery of the digital economy to its core. According to the 2025 Stanford AI Index, corporate AI investment worldwide reached 252.3 billion US dollars in 2024, with private investment climbing 44.5 percent year on year, while the share of organizations reporting the use of AI rose from 55 percent in 2023 to 78 percent in 2024 (Stanford HAI, 2025). Such figures confirm that AI is no longer an emerging technology under observation but an active factor of production that influences output, labor markets, and organizational design.

At the same time, the diffusion of AI is deeply uneven. Microsoft's Global AI Adoption 2025 report places the United Arab Emirates first in global usage with 64.0 percent of the working-age population applying AI by the end of 2025, Singapore second at 60.9 percent, and the United States at 28.3 percent in twenty-fourth place—despite being the world leader in model development and AI infrastructure (Microsoft AI Economy Institute, 2026). This divergence highlights that producing AI and using AI productively at the population level are two different challenges, shaped by distinct combinations of policy, capital, skills, and institutional readiness.

The economic and management sectors are at the center of this transformation. Finance, professional services, public administration, and manufacturing are the domains in which AI is being deployed most intensively to automate routine cognitive work, augment decision-making, detect fraud, optimize supply chains, and personalize services. An effective analysis of international practice therefore requires attention not only to national strategies but also to concrete sectoral applications and the governance frameworks that surround them.

This article compares four national experiences that together illustrate the main global models of AI deployment in the economy and in public management. The United States is the largest AI market and the principal source of frontier research, development, and venture capital. Singapore, while small in population, is consistently ranked at the top of global indices of AI preparedness and government digital readiness. South Korea has built an explicitly industrial strategy around AI-powered manufacturing, semiconductors, and a comprehensive legal framework. Estonia has fewer than 1.5 million inhabitants but is widely regarded as the most advanced laboratory of AI-driven public administration in Europe. Analyzing these cases in parallel brings into focus the policy instruments, institutional choices, and economic outcomes that other countries can study when designing their own AI transitions.

2. The United States: A Private-Sector-Led AI Economy

2.1 Policy Framework and Strategic Orientation

The United States has pursued a predominantly market-driven model of AI development, with the federal government acting as a funder of basic research, a regulator of critical risks, and a lead customer through federal procurement, while leaving the bulk of innovation to private firms and universities. Between 2023 and 2025 the policy framework underwent significant change. Executive Order 14110 of October 2023 on the "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" established detailed reporting requirements for frontier models, mandated the development of an AI Bill of Rights, and aimed to expand the federal AI workforce. In January 2025, Executive Order 14179, "Removing Barriers to American Leadership in Artificial Intelligence," revoked the previous framework and reoriented federal policy toward what the administration described as a "minimally burdensome" approach that emphasizes economic competitiveness and national security (The White House, 2025a). This was complemented in December 2025 by the Executive Order "Ensuring a National Policy Framework for Artificial Intelligence," which sought to preempt divergent state-level AI laws and create a single national baseline for AI regulation, with important implications for banks, fintechs, and other financial institutions operating across multiple states (The White House, 2025b).

2.2 Scale of Investment and Adoption in the Economy

The scale of US private investment in AI remains unrivaled. In 2024, private investment reached 109.1 billion US dollars, nearly twelve times the level of China and twenty-four times that of the United Kingdom; in generative AI specifically, US investment exceeded the combined total of China and the European Union plus the United Kingdom by 25.4 billion dollars (Stanford HAI, 2025). Menlo Ventures reports that enterprise spending on AI applications alone reached 15.7 billion dollars in 2025, with more than half of enterprise AI budgets flowing to applications rather than infrastructure—a sign that business value, not experimentation, is driving procurement decisions (Menlo Ventures, 2025).

Federal Reserve data show that adoption is highest in professional, scientific, and technical services (about 33 percent of firms) and the financial sector (about 30 percent), with work-related generative-AI use reported by roughly 63 percent of financial-sector workers and 62 percent of professional-services workers by late 2025 (Federal Reserve Board, 2026). Estimates from the Federal Reserve Bank of St. Louis suggest that, factoring in both users and non-users, generative AI had already increased aggregate US labor productivity by up to 1.3 percent by mid-2025—a meaningful contribution within three years of the technology's mass availability (Federal Reserve Bank of St. Louis, 2025).

2.3 Management and Sectoral Applications

In the management layer of US firms, AI has become embedded across core workflows. Coding has emerged as the breakout enterprise use case, accounting for roughly 55 percent of departmental AI spending in 2025, with approximately half of professional developers using AI coding tools daily. Other major departmental applications include customer support, marketing, sales, and human-resource processes. In the financial sector, global spending on AI exceeds 20 billion dollars per year, with fraud detection processing millions of transactions per second, robo-advisors managing over 1.2 trillion dollars in assets, and 68 percent of hedge funds employing AI for market analysis and trading strategies (Netguru, 2025). Healthcare has become one of the most intensive adopters, led by AI ambient-scribe systems, which alone grew into a market worth about 600 million dollars in 2025 by reducing clinical-documentation time for physicians.

The US federal government also uses AI internally, with agencies deploying tools for tax-return triage at the Internal Revenue Service, fraud detection at the Social Security Administration, scientific computing at the Department of Energy, and veterans' health risk prediction at the Department of Veterans Affairs. The April 2025 OMB memoranda on federal AI use and procurement set streamlined requirements for inventorying, testing, and scaling AI systems inside the government itself (The White House, 2025c). Taken together, the US model combines massive private capital, leadership in frontier research, rising enterprise penetration, and a regulatory framework still in flux between safety-oriented and competitiveness-oriented approaches.

3. Singapore: Whole-of-Economy Orchestration of AI

3.1 From NAIS 1.0 to NAIS 2.0

Singapore was one of the first countries in the world to publish a national AI strategy, in 2019, and has since become a reference case for the systematic integration of AI into a small, open, service-oriented economy. The first National AI Strategy identified five high-value sectors—transport and logistics, smart cities and estates, healthcare, education, and safety and security—and launched flagship national AI projects in each. In December 2023, Deputy Prime Minister Lawrence Wong unveiled the National AI Strategy 2.0 (NAIS 2.0) at the inaugural Singapore Conference on AI, signaling a shift from sector-specific projects to a "whole-of-economy, whole-of-government" approach (Ministry of Digital Development and Information, 2023).

NAIS 2.0 is organized around two goals—excellence and empowerment—and fifteen concrete actions clustered across three systems (activity drivers, people and communities, infrastructure and environment) and ten enablers. Notable targets include anchoring AI centers of excellence across key industries, expanding the AI talent pool from about 4,500 practitioners to 15,000, building sovereign high-performance computing capacity, and establishing a trusted regulatory environment for both traditional and generative AI. Singapore's vision is summarized in the phrase "AI for the Public Good, for Singapore and the World," placing the country as both a user and a responsible architect of global AI governance (Smart Nation Singapore, 2026).

3.2 Adoption in Enterprises and the Economy

The results of this strategy are increasingly visible in adoption statistics. According to the Singapore Digital Economy Report released by the Infocomm Media Development Authority (IMDA), the share of small and medium-sized enterprises using AI rose from 4.2 percent in 2023 to 14.5 percent in 2024, while adoption among larger enterprises jumped from 44 percent to 62.5 percent over the same period (IMDA, 2026). More than fifty companies across various sectors have established AI Centers of Excellence in Singapore, the country hosts over 1,100 AI start-ups, and it consistently ranks at the top of the IMF's AI Preparedness Index (NAIS 2023 strategy paper, 2023).

In March 2026 the Ministry of Digital Development and Information announced the National AI Impact Programme (NAIIP), which aims to support 10,000 enterprises over three years in adopting and deepening AI use, alongside tailored AI-fluency programs for accountants, lawyers, and software engineers. These programs aim to shift professionals away from routine documentation and compliance work toward higher-value advisory, analytical, and decision-making tasks (IMDA, 2026). Microsoft's 2025 adoption study ranked Singapore second globally, with 60.9 percent of the working-age population using AI, confirming the country's strong position in population-level diffusion (Microsoft AI Economy Institute, 2026).

3.3 Governance, Trust, and Public-Sector Use

Singapore has combined its aggressive adoption strategy with a deliberate investment in governance tools. AI Verify, introduced in 2022 and updated in 2024 to cover generative AI, is a testing framework that allows companies to evaluate their AI systems against eleven internationally recognized principles such as transparency, fairness, and accountability. Project Moonshot, one of the world's first open-source toolkits for large language model evaluation, combines benchmarking with red-teaming capabilities and is already used by developers and compliance teams worldwide (Smart Nation Singapore, 2026). Within the government itself, AI is being deployed broadly to improve operational efficiency and service delivery, ranging from adaptive learning in schools and chronic-disease management in hospitals to immigration and customs clearance and the automated detection of online scams.

4. South Korea: Industrial AI and a Comprehensive Legal Framework

4.1 AI as the Core of Economic Strategy

South Korea has built one of the most explicit "AI-industrial" strategies in the world, linking AI deployment directly to the country's manufacturing base, demographic challenge, and geopolitical competition. In August 2025, the Lee Jae-myung administration unveiled an economic-growth blueprint structured around thirty flagship projects, half of them AI-centered, with the declared ambition of placing South Korea among the world's top three AI powers, the so-called "AI G3" by 2030 (Citi Global Insights, 2025). Bank of Korea estimates show why this ambition is more than aspirational: without AI-driven productivity gains, Korean GDP is projected to fall by roughly 16.5 percent between 2023 and 2050 due to aging and a shrinking labor force, but successful AI adoption could narrow that decline to between 5.9 and 13.2 percent.

4.2 Manufacturing AI Transformation (M.AX)

The centerpiece of this strategy is the Manufacturing AI Transformation (M.AX) initiative, led by the Ministry of Trade, Industry and Energy. The plan sets a target of building 500 AI-powered factories by 2030, developing fifteen leading manufacturing AI models through public-private partnerships, and beginning mass production of humanoid robots by 2029. Large national champions including Samsung Electronics and Hyundai Motor have joined the M.AX Alliance alongside leading domestic AI firms to co-develop applications in shipbuilding, automotive assembly, semiconductor fabrication, and defense manufacturing (Stimson Center, 2026). The integration of AI-powered robotics into precision welding and predictive maintenance is estimated to raise productivity by approximately 30 percent, while AI-powered supply-chain tools reduce procurement bottlenecks.

To accelerate diffusion beyond the chaebol, the government announced in October 2025 a joint effort by the Ministry of SMEs and Startups, the Ministry of Science and ICT, and the Ministry of Trade, Industry and Energy to raise the 2026 AI transformation budget to 455.2 billion Korean won (approximately 337 million US dollars), an 83.6 percent increase year over year, and to expand AI education to small-business owners nationwide (KoreaTechDesk, 2025). Underlying these programs is heavy investment in sovereign compute: a National AI Computing Center with funding of up to four trillion won is planned through 2030, supported by the AI Computing Infrastructure Master Plan.

4.3 AI in Finance and the Basic Act on Artificial Intelligence

In the financial sector, Korean banks, insurers, and securities firms have accelerated the use of AI in credit scoring, fraud detection, biometric know-your-customer processes, personalized advisory, and back-office automation. The South Korean AI-in-finance market was estimated

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at 3.43 trillion won in 2025, with generative-AI applications expected to grow at a compound annual rate of 43.9 percent through 2030 (Nucamp, 2025). Financial supervisors, including the Financial Services Commission and the Financial Supervisory Service, issued successive guidelines on responsible AI use from 2021 onward, focusing on fairness, transparency, and consumer protection.

The legal foundation was strengthened by the Framework Act on the Development of Artificial Intelligence and the Establishment of Trust—often called the AI Basic Act—promulgated on 21 January 2025 and entering into force on 22 January 2026. It is widely considered the first comprehensive, enforceable AI law in the Asia-Pacific region. The Act defines categories of "high-impact" AI systems, including those used for loan screening, recruitment, healthcare, energy, and public services, and imposes obligations regarding risk management, documentation, transparency, and human oversight. Administrative fines are capped at a moderate level of thirty million won, reflecting a regulatory philosophy described by analysts as "promotion plus regulation" rather than strict command-and-control (Future of Privacy Forum, 2025; IAPP, 2025). Korea's approach thus pairs rapid sectoral adoption with a clear governance scaffold, a balance explicitly intended to keep the country competitive without undermining public trust.

5. Estonia: AI Embedded in a Fully Digital State

5.1 A Digital Society as Foundation

Estonia occupies a unique position in the international landscape of AI application. A country of fewer than 1.5 million people, it has since the 1990s built what is arguably the world's most advanced digital state, with approximately 99 percent of public services available online, universal digital identity, and the X-Road data-exchange backbone connecting public and private information systems. By October 2020, the Estonian government had already deployed forty-one AI solutions across agencies (Global Government Forum, 2022). In Estonian policy discourse, AI systems are called kratts, a reference to the folkloric household creatures of hay and wood that serve their master but must constantly be given work—an image that conveys both the utility and the risks of AI (e-Estonia, 2022).

5.2 Bürokratt and the AI Gov Stack

The flagship project of Estonia's AI-in-government program is Bürokratt, a voice- and text-enabled virtual assistant first announced in 2020 and progressively launched from 2022 onward. Bürokratt is not a single chatbot but an interoperable network of AI assistants deployed across public-sector websites, intended to allow a citizen to resolve any administrative need through a single conversation—submitting applications, paying fees, updating registry data, or receiving proactive notifications. The system is envisaged as the AI-era equivalent of the X-Road, providing a shared channel through which public and private services can cooperate (Information System Authority of Estonia, 2025).

From 2026 onward, the government has focused on personalized AI agents, widening the interoperable network, and developing an Estonian-adapted large language model with retrieval-augmented generation, so that assistants can pull accurate, up-to-date answers from authoritative databases. Estonia has also committed to cross-border interoperability, working to connect Bürokratt with neighboring systems such as Finland's AuroraAI so that Estonians can access the same personalized services while abroad (GovInsider, 2025). To share the benefits beyond its borders, Estonia is building an "AI Gov Stack," a repository of open-source AI building blocks for digital government; as of late 2022, twenty-six reusable AI components had been released, with more added each year (Computer Weekly, 2022).

5.3 Governance, Trust, and Economic Effects

Estonia's approach combines an ambitious vision—becoming an "AI-powered government" by 2030—with a strong emphasis on transparency, citizen consent, and responsible-AI requirements embedded in all publicly funded projects. A data-tracker tool allows citizens to see which institutions have accessed their data, and the modular open-source architecture allows parliamentary oversight and civil-society scrutiny of individual components. The economic payoff is expected to come through multiple channels: reduced administrative costs, time savings for citizens and businesses, improved accessibility for elderly and disabled users, and more efficient cross-agency decision-making in areas such as healthcare, taxation, and social benefits (Public Sector Network, 2024). For a small state with limited fiscal room and a tight labor market, these gains are strategically important, and the Estonian experience is widely studied by other European and developing-country governments.

6. Comparative Analysis and Lessons Learned

Read together, the four case studies reveal a clear pattern: there is no single "correct" model of AI deployment, but rather a set of design choices shaped by the size of the economy, the structure of its industrial base, and its administrative tradition. The United States exemplifies a scale-driven, private-capital-led model, in which the key contribution of the state is to fund basic research, secure critical infrastructure, and refine a regulatory framework that balances innovation against safety. Singapore demonstrates how a small, high-capacity state can orchestrate a whole-of-economy transformation through carefully sequenced strategies, combining generous enterprise support with strong governance institutions such as AI Verify and Project Moonshot. South Korea shows the logic of an explicitly industrial strategy, in which AI is harnessed to defend a manufacturing-heavy economy against demographic decline and rising competition, supported by a clear legal framework in the AI Basic Act. Estonia illustrates the administrative frontier: a country that has used AI to push e-government into a new generation of proactive, personalized, and voice-enabled public services.

Several common lessons emerge. First, sustained public investment is indispensable even in market-led systems, whether through research funding, compute infrastructure, or training programs. Second, talent is the binding constraint in every case, and each country has adopted aggressive strategies to grow or attract AI professionals. Third, governance is not a brake on adoption but a precondition for it: frameworks such as Singapore's AI Verify, South Korea's AI Basic Act, and Estonia's responsible-AI requirements have all coexisted with strong growth in deployment. Fourth, small states compete by focusing tightly on specific niches—Singapore on governance and hub functions, Estonia on digital public administration—while large states compete on scale. Finally, the gap between AI production and AI usage identified by the Microsoft AI Economy Institute underscores that leadership in frontier research does not automatically translate into broad productivity gains, which instead require sustained effort in adoption, skills, and process change (Microsoft AI Economy Institute, 2026).

7. Conclusion

The international experience surveyed in this article shows that artificial intelligence has become a central instrument of economic policy and public management in countries as different as the United States, Singapore, South Korea, and Estonia. Each has chosen a distinctive path: the United States drives the global frontier through private investment and innovative enterprise; Singapore combines compact orchestration with world-class governance tools; South Korea leverages industrial policy and a comprehensive legal framework to modernize its manufacturing-led economy; and Estonia demonstrates how a fully digital state can make AI the everyday fabric of public administration. For policymakers in other economies, the value of these cases lies not in mechanical imitation but in the menu of strategic options they offer—investments in compute and talent, sectoral focus, enterprise support programs, governance frameworks, and citizen-centered public services. The coming decade will be shaped by how effectively countries translate AI capabilities into sustainable productivity growth, inclusive opportunity, and trustworthy institutions, and the experiences of the United States, Singapore, South Korea, and Estonia provide a rich body of evidence to inform those choices.

References

1. Citi Global Insights. (2025). South Korea's AI & Innovation Investment. Citigroup. Retrieved from https://www.citigroup.com/global/insights/south-korea-ai-innovation-investment
2. Computer Weekly. (2022, August). Estonia is building AI Gov Stack. Retrieved from https://www.computerweekly.com/news/252523354/Estonia-is-building-AI-Gov-Stack
3. e-Estonia. (2022). Estonia's new virtual assistant aims to rewrite the way people interact with public services. Retrieved from https://e-estonia.com/estonias-new-virtual-assistant-aims-to-rewrite-the-way-people-interact-with-public-services/
4. Federal Reserve Bank of St. Louis. (2025, November). The State of Generative AI Adoption in 2025. On the Economy Blog. Retrieved from https://www.stlouisfed.org/on-the-economy/2025/nov/state-generative-ai-adoption-2025
5. Federal Reserve Board. (2026). Monitoring AI Adoption in the U.S. Economy. FEDS Notes. Retrieved from https://www.federalreserve.gov/econres/notes/feds-notes/monitoring-ai-adoption-in-the-u-s-economy-20260403.html
6. Future of Privacy Forum (FPF). (2025, April). South Korea's New AI Framework Act: A Balancing Act Between Innovation and Regulation. Retrieved from https://fpf.org/blog/south-koreas-new-ai-framework-act-a-balancing-act-between-innovation-and-regulation/
7. Global Government Forum. (2022). Estonia steps up virtual civil servant project. Retrieved from https://www.globalgovernmentforum.com/estonia-steps-up-virtual-civil-servant-project/

8. GovInsider. (2025, October). Estonia eyes cross-border interoperability for Bürokratt, its "Siri of public services." Retrieved from https://govinsider.asia/intl-en/article/estonia-eyes-cross-border-interoperability-for-burokratt-its-siri-of-public-services
9. International Association of Privacy Professionals (IAPP). (2025). Global AI Governance Law and Policy: South Korea. Retrieved from https://iapp.org/resources/article/global-ai-governance-south-korea
10. Infocomm Media Development Authority (IMDA). (2026, March). National AI Impact Programme: Empowering Enterprises and Workers to Transform with AI. Ministry of Digital Development and Information, Singapore. Retrieved from https://www.imda.gov.sg/
11. Information System Authority of Estonia (RIA). (2025). The Vision of Bürokratt. Retrieved from https://www.ria.ee/en/state-information-system/personal-services/burokratt
12. KoreaTechDesk. (2025, October). Korea Expands AI Transformation Budget by 84% to Accelerate Smart Manufacturing and Startup Growth. Retrieved from https://koreatechdesk.com/
13. Menlo Ventures. (2025, December). 2025: The State of Generative AI in the Enterprise. Retrieved from https://menlovc.com/perspective/2025-the-state-of-generative-ai-in-the-enterprise/
14. Microsoft AI Economy Institute. (2026, January). Global AI Adoption in 2025. Microsoft Corporate Responsibility Report. Retrieved from https://www.microsoft.com/en-us/corporate-responsibility/topics/ai-economy-institute/reports/global-ai-adoption-2025/
15. Ministry of Digital Development and Information (MDDI), Singapore. (2023, December 4). National Artificial Intelligence Strategy 2.0 to Uplift Singapore's Social and Economic Potential. Press release. Retrieved from https://www.mddi.gov.sg/newsroom/04122023/
16. National AI Strategy 2.0 (NAIS 2.0). (2023). AI for the Public Good, for Singapore and the World. Smart Nation Singapore. Retrieved from https://file.go.gov.sg/nais2023.pdf
17. Netguru. (2025, December). AI Adoption Statistics in 2026. Retrieved from https://www.netguru.com/blog/ai-adoption-statistics
18. Nucamp. (2025, September). The Complete Guide to Using AI in the Financial Services Industry in South Korea in 2025. Retrieved from https://www.nucamp.co/blog/
19. Public Sector Network. (2024, October). Case Study: AI Implementation in the Government of Estonia. Retrieved from https://publicsectornetwork.com/insight/case-study-ai-implementation-in-the-government-of-estonia
20. Smart Nation Singapore. (2026). National AI Strategy. Retrieved from https://www.smartnation.gov.sg/initiatives/national-ai-strategy/
21. Stanford Institute for Human-Centered AI (Stanford HAI). (2025). The 2025 AI Index Report: Economy. Stanford University. Retrieved from https://hai.stanford.edu/ai-index/2025-ai-index-report/economy
22. Stimson Center. (2026, February). From Compute to Capacity: South Korea's Approach to Industrial AI Adoption. Retrieved from https://www.stimson.org/2026/from-compute-to-capacity-south-koreas-approach-to-industrial-ai-adoption/

23. The White House. (2025a, January 23). Executive Order 14179: Removing Barriers to American Leadership in Artificial Intelligence. Retrieved from https://www.whitehouse.gov/presidential-actions/2025/01/removing-barriers-to-american-leadership-in-artificial-intelligence/
24. The White House. (2025b, December 11). Executive Order: Ensuring a National Policy Framework for Artificial Intelligence. Federal Register, 90, 2025-23092. Retrieved from https://www.federalregister.gov/documents/2025/12/16/2025-23092/ensuring-a-national-policy-framework-for-artificial-intelligence
25. The White House. (2025c, April). White House Releases New Policies on Federal Agency AI Use and Procurement. Retrieved from https://www.whitehouse.gov/articles/2025/04/white-house-releases-new-policies-on-federal-agency-ai-use-and-procurement/