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SINGAPORE CHAPTER

Asia/Pacific AI Maturity Study 2024

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Executive summary

If 2023 was a year of "artificial intelligence (AI) awakening" due to the rise of ChatGPT, 2024 is a year when organizations start building a more pragmatic view of how they can incorporate AI long term. In Asia/Pacific, predictive, interpretive, and generative AI (GenAI) use cases will become more expansive and external-facing as organizations recognize their benefits – from improving internal processes and productivity, to delivering personalized customer experience (CX) and enhancing market differentiation.

Despite the great interest and surge in AI usage, IDC's study of eight Asia/Pacific economies (Australia, India, Indonesia, Japan, South Korea, Malaysia, Singapore, and Taiwan) shows that they are in the mid-stages of overall AI maturity.

According to the IDC Asia/Pacific AI Maturity Study 2024, the level of AI maturity in each market depends on several factors across three dimensions:

Enterprise (strategy, process, human capital, technology and data readiness)

Government (policy, regulatory and investment support)

Socio-economic (economic, social, and skills)

AI maturity requires all three dimensions in varying degrees and at different stages of development:

- Investments in enterprise data and technology create options and build experience and executive confidence in the value of future investments.
- Supportive government policies and regulations remove uncertainties and clarify the rules by which enterprises should engage with data and AI technologies.
- Scaling up AI is often constrained by skills and the readiness of local employees to adopt these new technologies.

This IDC InfoBrief dives deeper into the findings of the IDC Asia/Pacific AI Maturity Study 2024 and explores the current AI landscape, the state of AI and its challenges, and AI spending forecasts and future potential in this region – providing guidance and recommendations for the markets studied to move up the AI maturity ladder.

AI spending for Asia/Pacific is forecast to grow at a compound annual growth rate (CAGR) of 28.9% from 2022 to reach $90.7 billion by 2027.

However, AI regulatory divergence across geographies will create major challenges for A2000* companies at the same time, increasing implementation time and effort for sensitive use cases by up to 20%.

Sources: IDC FutureScape: Worldwide AI and Automation 2024 Predictions — Asia/Pacific (Excluding Japan) Implications; Initial GenAI Implementation Forecast, October 2023
*A2000 – refers to the top 2,000 Asia-based organizations by revenue

What is driving AI adoption in Asia/Pacific?

Organizations' AI spending in Asia/Pacific will reach $90.7 billion by 2027, growing at a CAGR of 28.9% from 2022 to 2027.

Top AI adoption drivers for 2023-2024

1. Improve employee productivity
2. Accelerate new product introduction
3. Reduce costs
4. Improve operations efficiency
5. Improve risk management
6. Generate new revenue

Internally-focused goals Externally-focused goals

AI adoption in 2024 will become more expansive and externally driven, especially in Asia/Pacific. In contrast to the emphasis on improving efficiencies and cost-cutting to counteract global inflationary pressures in 2023, organizations are using AI to augment the value delivered by their digital platforms and to expand their market reach. Their top adoption drivers emphasize employee productivity across existing functional areas such as IT and marketing, followed by plans to accelerate new product introduction.

Enterprises in particular are optimistic about the potential of AI to:

Improve productivity, simplify operations, automate processes, reduce costs, provide data-driven insights that enhance decision-making capabilities.

Transform industries, create product and service differentiation, generate new revenue streams.

These promise to deliver trillions of dollars in economic growth globally. **But such large-scale enterprise adoption can only occur if government regulations, supportive policies, as well as socio-economic conditions, such as skills and incentives, are in place.**

2023 A year of planning: internally focused AI initiatives aimed at driving productivity, reducing costs, and enhancing operational efficiencies.

2024 AI use cases become more expansive and externally focused, driven by extensive adoption of AI across Asia/Pacific.

2028 AI will drive economic expansion, creating new business models and ways of doing things unknown to us today.

Sources: GenAI ARC Survey, 2023 (August 2023); Data-Driven Enterprise Survey, 2023 (May 2023); IDC FutureScape: Worldwide AI and Automation 2024 Predictions — Asia/Pacific (Excluding Japan) Implications

AI is more than GenAI

Despite the hype around GenAI, only **19%** of Asia/Pacific AI budgets are focused on GenAI, with **81%** directed toward predictive AI and interpretative AI. But increasingly, we expect that use cases will cross multiple AI categories (predictive AI, interpretative AI, and GenAI), with GenAI the fastest growing, particularly in Asia/Pacific – **15%** of Asia/Pacific organizations' 2024 IT budgets have been earmarked for GenAI, compared to the worldwide average of 11%. We believe this is driven by proactive business planning, fewer regulations, strong government support, and a deeper regional belief (**84%** of Asia/Pacific enterprises) that leveraging GenAI models will provide a significant competitive edge for their business. Asia/Pacific markets especially highlight these desired business outcomes from GenAI – increased operational efficiency and employee productivity, improved customer satisfaction, and the development of new business models.

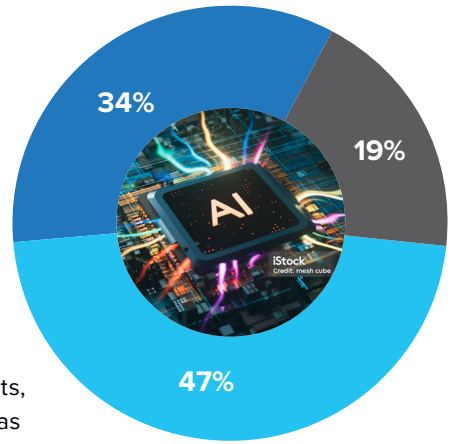
2024 investment allocation for AI-related development, data, and infrastructure

PREDICTIVE AI

- Utilizes historical data and provides future predictions
- Use cases: weather forecasting and financial fraud detection

INTERPRETIVE AI

- Enhances human efforts, advancing tasks such as image and voice recognition
- Use case: cancer detection



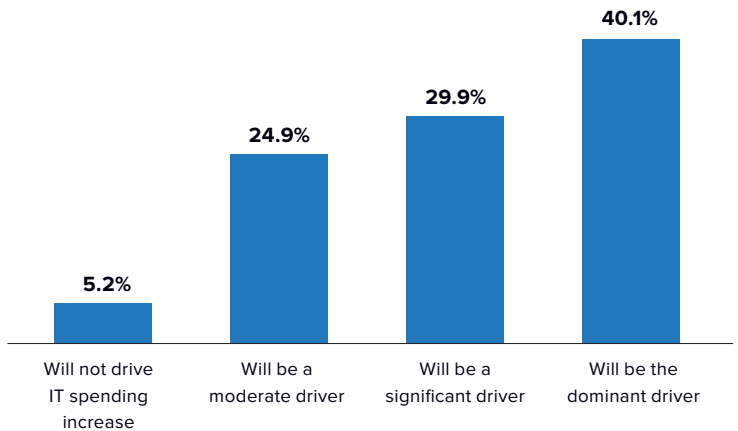
GenAI

- Creates new content/code using previously created content/code
- Examples: ChatGPT and developer copilots

Will GenAI drive IT spending increase?

70% of Asia/Pacific organizations cited GenAI as a significant or dominant factor driving up IT spending.

Issues like high cost of computing resources and the need to address skill gaps, such as prompt engineering for accurate GenAI responses, are crucial factors.



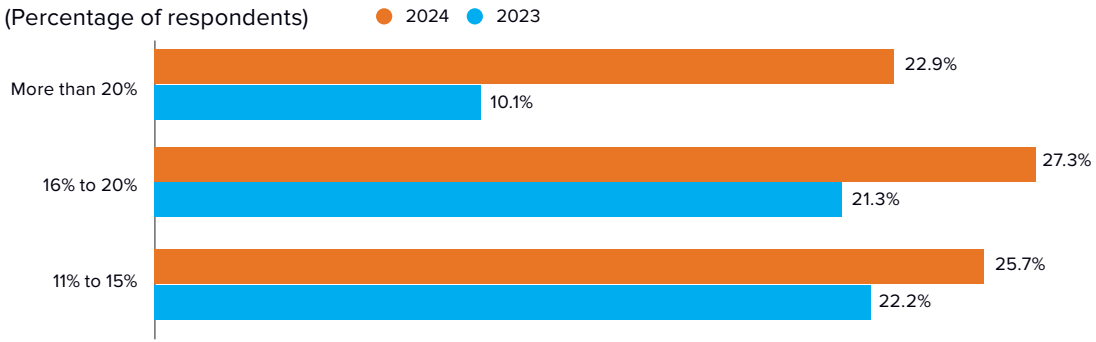
Sources: GenAI ARC Survey, 2023 (August 2023); Data-Driven Enterprise Survey, 2023 (May 2023)

AI on the edge is rising – welcome to the age of hybrid AI

As we bring AI to everything and everywhere, making AI real time becomes increasingly critical, especially in areas like manufacturing and healthcare, but is often hindered by latency issues associated with centralized infrastructures. Hence, the shift to edge computing – where data generated at the edge, e.g., Internet of Things (IoT) devices and applications, are processed at the edge, which improves response time and lowers costs. IDC believes this is pivotal to truly bringing AI everywhere.

In fact, by 2025, **75%** of enterprise-generated data globally will be created and processed outside of traditional datacenters or the cloud, but on the edge; at least **75%** of Asia/Pacific organizations surveyed expect to spend more on edge in 2024, with about **50%** estimating edge to account for at least 16% of their overall IT expenditure.

Organizations' estimated expenditure on edge computing as a percentage of total IT expenditure for 2023 and 2024



Edge use cases most impacted by AI

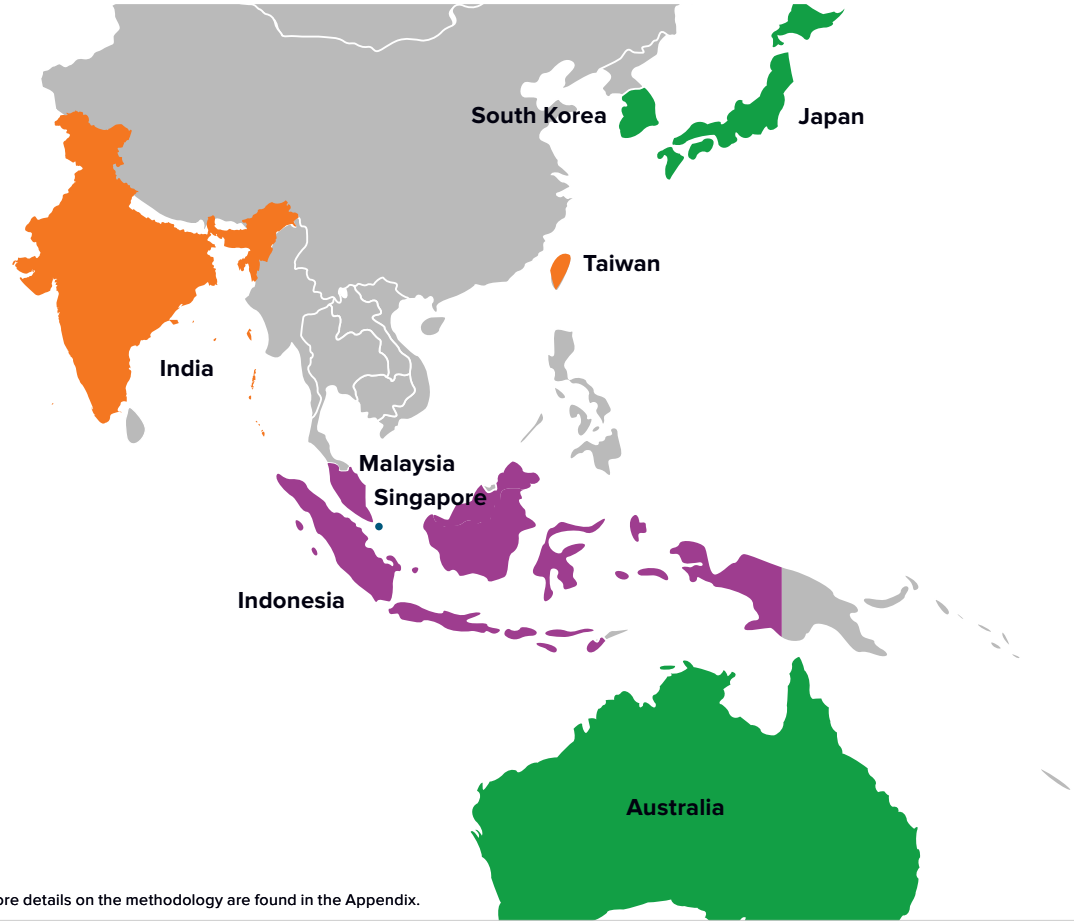
AI from datacenter to cloud, from client to edge

Edge/Endpoints	Edge infrastructure	Communications	Primary client	Datacenter
Automotive	Heavy edge	Network infrastructure	PC	Servers
Enterprise IoT			Phones	
Industrial IoT	Light edge	Wireless infrastructure	Tablets	Storage systems
Consumer IoT				

Source: IDC CIO Playbook Survey, 2023

Most Asia/Pacific markets are still in the mid-stages of overall AI maturity

IDC conducted the Asia/Pacific AI Maturity Study to assess how far individual markets have progressed in adopting AI. They are evaluated on three key dimensions – enterprise, government, and socio-economic readiness factors. Five of the eight markets studied are at stage 2 or 3, at the mid-levels of maturity. Only one, Singapore, is at stage 4 – an early-stage AI Leader. See Appendix (page 18) for details on the methodology.



More details on the methodology are found in the Appendix.

Stage 1 — AI Explorer (Indonesia, Malaysia)
This maturity stage is characterized by the exploration of AI opportunities as well as a need to demonstrate clear results to justify investments. AI use cases are mainly experimental or project-based, with room to improve IT infrastructure, data, process, and skills to enable innovation and industry-wide transformation.

Stage 2 — AI Practitioner (India, Taiwan)
This maturity stage is characterized by tactical AI and innovation initiatives defined by reactive interventions through technology, data, processes, and people to accomplish shorter-term objectives. There are some successful use cases but not at scale.

Stage 3 — AI Innovator (Australia, Japan, South Korea)
This maturity stage is characterized by concerted efforts in planning and managing AI initiatives through well-laid technology infrastructure and data management strategies. New use cases are often introduced, especially industry use cases.

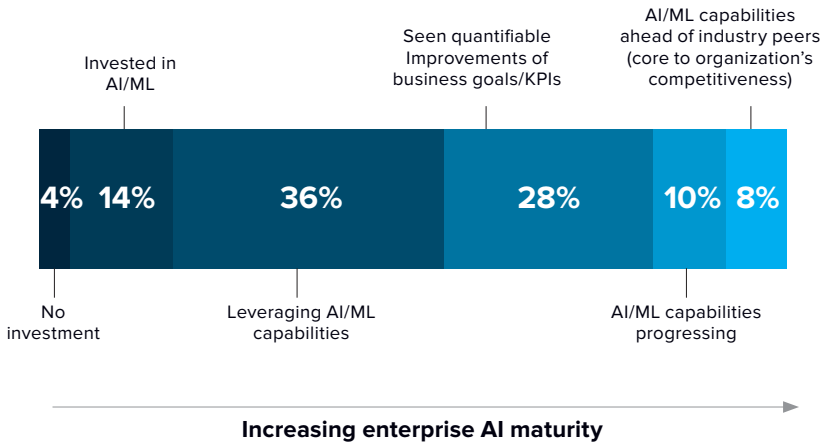
Stage 4 — AI Leader (Singapore)
This maturity stage is characterized by the presence of an AI-first and data-ready culture, and the ability to scale AI to achieve short- and long-term objectives. Enterprises take a dynamic and disruptive approach toward AI and innovation, supported by executive leadership and established processes.

While many enterprises are keen to explore AI, few are truly successful

While an impressive **82%** of larger organizations in Asia/Pacific surveyed are leveraging AI/ML's capabilities, only **8%** are truly integrating AI at scale such that it becomes core to their organizations' competitiveness.

While there are common challenges like data management, skills gap, and costs when it comes to implementation, infrastructure, ecosystem support, regulations, and organizational change management failure are the pitfalls of AI projects.

How organizations describe their AI/ML-related capabilities



To succeed with AI requires enterprise-wide investments in flexible and scalable platforms and infrastructure, change management, training and upskilling. This is challenging and takes time. That said, some industries are more mature than others – e.g., financial services have long prioritized AI for risk and compliance management, whereas healthcare is just starting to make the necessary investments.

Top reasons why AI projects fail

1. **Inability to select the right use case**
   Choosing the right AI use cases is crucial to ensure that value can be derived, and that it is cost-effective and sustainable in the long term; however, many businesses lack the AI maturity for this.

2. **Lack of infrastructure and support**
   Organizations should thoroughly analyze the project's technological requirements beforehand, plan long-term and future-proof the infrastructure with flexible and scalable technology stacks, or consider using cloud-based solutions to avoid up-front costs.

3. **Failure to comply with relevant laws and regulations**
   Data and AI regulations are still evolving. Organizations need to stay abreast of the latest regulations and perform thorough risk and compliance assessments to ensure transparency and compliance.

4. **Unclear goals**
   Technology is never an end in itself and AI is no exception. Organizations must first identify the specific business values they want to achieve and the tasks that the AI system can perform to meet this goal. They must also decide on the metrics and have the evaluation tools in place.

5. **Lack of vendor support**
   AI requires a host of complex capabilities across hardware, software, systems, and processes. No company can operate in this space without support from its ecosystem partners. Choose solutions and partners with an eye on the long term.

Source: IDC Data-Driven Enterprise Survey, 2023

State of AI maturity in Asia/Pacific: enterprise factors

The table below ranks, by order of importance ("1" being the most important), the attributes that contribute to, and influence the level of enterprise AI maturity in the eight Asia/Pacific markets.

1

Strategy

Most enterprises in the region have very limited maturity in terms of their AI strategy. This is unsurprising given the early stage of development of AI technologies in general and GenAI in particular. Many organizations have experimented with AI on isolated data sets and small models; however, the most sophisticated markets such as **Singapore** and **Australia** have enterprises with firm-wide AI-first strategies built at scale.

2

Human capital

A major challenge to realizing AI is that the demand for skills such as data science, ML, and deep learning far exceeds supply in many economies. Those with the skills are often poached by markets such as **Singapore** and **Australia** offering higher pay. Some markets, notably **India**, have prioritized AI skills development in their universities, and this home-grown talent has supported a boom in startups. Moving forward, the development of standard AI libraries and copilots should mitigate this supply shortage as business specialists start to engage in AI development.

3

Data

The raw material of AI is data, and the availability of quality structured and unstructured data for use in AI models is especially a challenge when working on the largest GenAI models. Small companies tend to have less data, and companies without enterprise data architectures such as data warehouses and data fabrics, struggle to organize what they do have. Such architectures are found in large international enterprises forced to compete at scale and are most often found in **Japan**, **South Korea**, **Australia**, and **Singapore**.

4

Processes

AI at scale involves developing, training, testing, and maintaining not just a few ML models, but thousands or more. There is an urgent need for a disciplined approach to the AI life cycle involving myriad specialists doing precisely defined and orchestrated tasks. Only the largest enterprises can afford to do this in-house, and so process maturity is typically found in **Singapore**, **Australia**, and **Japan**.

5

Technology

Surprisingly, access to technology is the least critical factor for enterprise succcess in AI. The widespread deployment of cloud-related tools and technologies makes these relatively accessible to most enterprises in most Asia/Pacific markets. This is especially true in financial services with established technology platforms that they can leverage. It is much less so in manufacturing and healthcare, which depend more on edge capabilities.

State of AI maturity in Asia/Pacific: government and socio-economic factors

The table below ranks, by order of importance, the attributes that contribute to and influence the state of AI maturity of the eight Asia/Pacific governments, as well as their socio-economic readiness.

1

SOC-ECON: GDP and population

A larger GDP generally indicates a higher level of economic activity and greater market wealth. Markets with larger GDPs have more financial resources available for investment in research and development, including AI initiatives. **Singapore**, **Australia**, **Japan**, and **South Korea** are all OECD economies with large GDP and high demand/supply on AI, which in turn allows them to have more resources to invest in AI.

2

GOV: AI spending

Government investment in AI is critical for advancing AI maturity. **Japan** is the biggest spender in the region and **Taiwan** anticipates about US$7.3 billion of AI investments in 2024. **Australia**, will set aside $101.2 million to support businesses to integrate quantum and AI technologies into their operations. This is on top of the $1 billion already allocated for critical technologies. The concentration of private and venture capital funds that invest in AI startups is important for AI technologies to advance. **Singapore** and **Japan** are leading in AI startup investments, while **India** is catching up with a blooming ecosystem of startups.

3

SOC-ECON: Complementary capabilities

Economies with more developed infrastructure, including high-speed internet connectivity, cloud computing resources, and datacenters allow better access to AI initiatives. This infrastructure is essential for supporting AI technologies, enabling data collection and processing, facilitating ML algorithms, and deploying AI applications at scale. Economies with higher level of digital maturity such as **Japan**, **Singapore**, and **Australia** are also the ones that are accelerating in AI capabilities. **Malaysia**, **Indonesia**, and **India** are expected to mature in AI capabilities in the next few years.

4

SOC-ECON: Talent and skills

Stronger economies with higher GDPs often have better education and training systems, and access to talent from around the world. They can attract and retain a larger pool of professionals, including researchers, engineers, data scientists, and AI specialists. These factors have helped **Singapore** and **Australia** lead in AI talent pools. Australian universities have produced over 52,000 AI-related research publications in the past 3 years, showing deep expertise in AI research. **Taiwan** churns out over 10,000 AI technicians and application specialists yearly from more than 20 AI degree programs. **India** and **Indonesia**, with larger, younger demographics, and strong AI skills training pipelines, can potentially amass the largest AI talent base in the region.

5

GOV: Regulations and policies

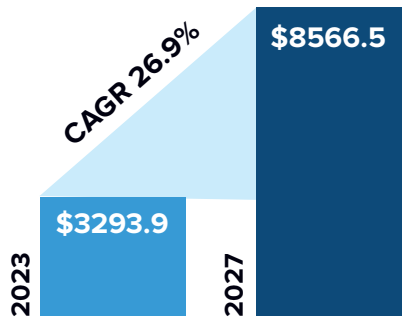
Economies more mature in AI tend to invest in AI research, establish supportive regulatory frameworks, and promote public-private sector collaboration to advance AI innovation. **South Korea** has contributed to the cause of trustworthy AI on the world stage through its involvement in developing the OECD AI Principles and participating in UNESCO's Recommendations on the Ethics of AI. **Singapore** and **Australia** are also fast-tracking their AI ethics framework and regulations. **Indonesia**, **Malaysia**, **India,** and **Taiwan** are steadily recognizing the importance of government strategies and frameworks for AI to thrive. For example, Malaysia's National Artificial Intelligence Roadmap 2021-2025 focuses on developing governance and infrastructure, and fostering AI talent and AI tech adoption.

Asia/Pacific AI spending by industry: BFSI and manufacturing

Banking, financial services and insurance (BFSI)

The BFSI sector has long led other industries in AI spending. Next-generation AI in BFSI increasingly personalizes customer experience (CX) approaches, leveraging geolocation and spending patterns, as well as supporting deeper client engagement, improving CX, and reducing customer attrition.

Asia/Pacific BFSI's AI spending ($M) 2023-2027



Key AI spending by use cases

- Augmented fraud analysis and investigation
- Program advisors and recommendation systems
- Automated threat intelligence and prevention systems
- GenAI : GenAI for audio, text, image, video

Key AI investment goals

- Operational efficiency
- Customer experience
- Employee productivity

Asia/Pacific financial institutions automate lending, onboarding, Know Your Customer (KYC), and account opening with AI and ML. This reduces errors, improves productivity, cuts costs, and enhances satisfaction.

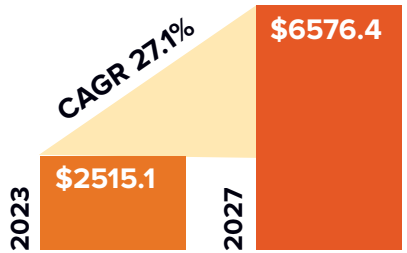
IDC Prediction

- By 2028, powered by CX analytics at the edge, real-time sentiment analytics will drive 33% of customer engagements, delivering 10% growth in customer loyalty and retention for banking firms.
- Expect 50% of the top 100 banks to hyper-personalize customer rewards and loyalty programs by 2026.

Manufacturing

AI/ML is the future of programming assistance and advanced inspection in manufacturing. Robotics has become more accessible, flexible, and versatile due to lower prices, ease of installation and programming, and universal end effector tools. Robots can readily tend to computer numerical control (CNC) machines, weld sheet metal, and navigate manufacturing autonomously.

Asia/Pacific manufacturing's AI spending ($M) 2023-2027



Key AI spending by use cases

- AI-augmented quality management investigation and recommendation system
- Automated preventative maintenance
- Digital assistants
- GenAI : GenAI for audio, text, image, video

Key AI investment goals

- Employee productivity
- Operational efficiency
- Knowledge management

AI, ML, and robotics boost output, enhance efficiency, and cut costs. Automation speeds up identifying and resolving machine failures, expands production capabilities, reduces mundane tasks, and increases productivity.

IDC Prediction

- By 2028, the integration of AI/ML into robotic and automation routines within industrial operations will increase by 30%, driving higher efficiencies and a 10% reduction in downtime.

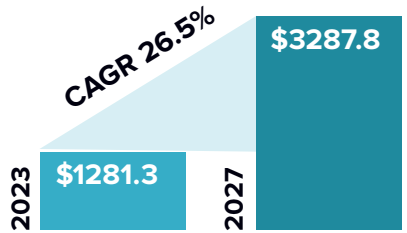
Source: IDC AI Spending Guide V2 2023 Forecast; IDC Syndicated BDA and AI Survey (Data-driven Intelligent Enterprise Survey) 2023, APJ Financial Services (n = 44), Manufacturing (n = 42); IDC FutureScape: Worldwide Banking 2024 Predictions; IDC FutureScape: Worldwide Manufacturing 2024 Predictions
Note: CAGR is for 2023 to 2027 (4 years)

Asia/Pacific AI spending by industry: government and telecommunications

Government

Government employees require quality real-time data to enhance collaboration, decision-making, and strategic thinking. Digital assistants can boost productivity by providing prompt responses, and empowering employees to make better decisions with fewer errors. They can also reduce rework time and ensure consistency in decision-making.

Asia/Pacific government's AI spending ($M) 2023-2027



Note: CAGR is for 2023 to 2027 (4 years)

Key AI spending by use cases

- Augmented fraud analysis
- Augmented defense, terrorism investigation, and government intelligence
- Augmented threat intelligence and prevention systems
- Program advisors and recommendation systems
- GenAI : GenAI for audio, text, image, video

Key AI investment goals

- Employee productivity
- New revenue generation
- Knowledge management

In Asia/Pacific, AI is used to assess worker performance, identify development areas, suggest training for productivity, attract new enterprises, and boost economic competitiveness.

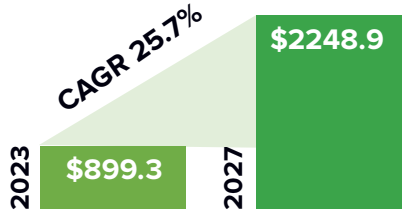
IDC Prediction

By 2026, 60% of governments will close digital gaps by automating and connecting data, processes, and employees and deploy AI-enabled platforms for intelligent operations end to end.

Telecommunications

Telecommunications (telecom) operators are leveraging AI to detect and predict network anomalies while service providers have long used AI to enhance CX through chatbots and conversational AI. Business process providers are developing chatbots to assist human agents, while application development providers incorporate GenAI in quality assurance testing.

Asia/Pacific telcos' AI spending ($M) 2023-2027



Key AI spending by use cases

- AI infrastructure provisioning
- Smart networking
- Program advisors and recommendation systems
- GenAI : GenAI for audio, text, image, video

Key AI investment goals

- Employee productivity
- New revenue generation
- Product service enhancement and differentiation

AI-powered technology helps telcos improve employee productivity by automating mundane tasks and analyzing market trends, customer preferences, and technological developments. This leads to the development of new telecom products and services that better address consumer needs.

IDC Prediction

By 2026, with the accelerated adoption of GenAI, 35% of enterprises will enhance edge computing use cases with contextual experience, further aligning business outcomes with customer expectations.

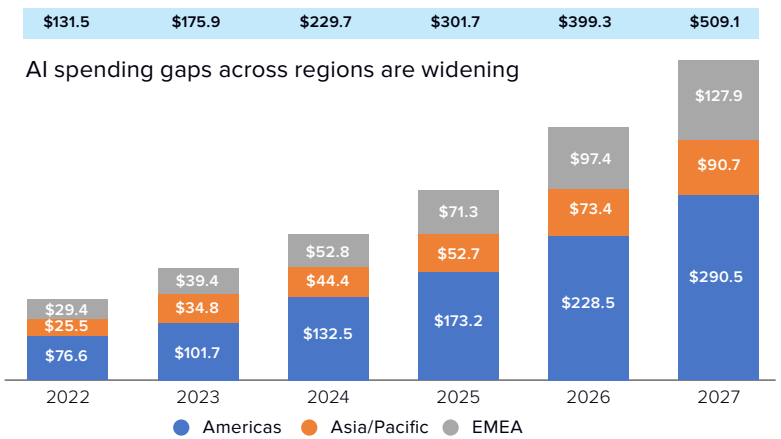
Sources: IDC AI Spending Guide V2 2023 Forecast; IDC Syndicated BDA and AI Survey (Data-driven Intelligent Enterprise Survey) 2023, APJ Government (n = 38), Telecommunications (n = 42); IDC FutureScape: Worldwide National Government 2024 Predictions; IDC FutureScape: Worldwide Future of Connectedness 2024 Predictions

The future of AI in Asia/Pacific: AI market to surpass $90 billion by 2027

IDC forecasts that AI spending in Asia/Pacific will grow at a CAGR of **28.9%** from 2022 to reach $90.7 billion by 2027. The Americas will continue to lead in GenAI investments, with Europe, the Middle East, and Africa (EMEA) and Asia/Pacific trailing behind. AI adoption in the three regions will continue to grow in the next few years, albeit slower in Asia/Pacific as its diverse cultural, linguistic, and regulatory landscape could potentially impede regional AI progress.

Within Asia/Pacific, AI adoption varies widely due to variances in economic development, regulations, infrastructure, and cultural attitudes. Nonetheless, across the region, IDC sees increasing growth in AI investments, and some markets are further ahead than others.

Total AI spending forecast in Asia/Pacific in comparison with EMEA, and Americas (US$B)

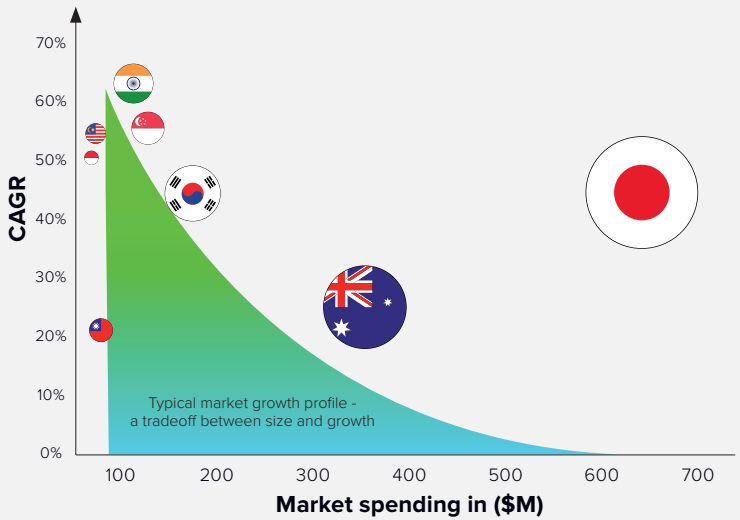


Source: Initial GenAI Implementation Forecast, October 2023

The importance of scale and learning in AI investments

Developed economies like **Australia, Japan, Singapore**, and **South Korea** have deeper financial resources and so have more existing investments in AI – as represented by the size of the bubbles in the chart below and their relative position to the right side of the chart. Having invested early in AI, these economies have learned to use these technologies better, and as they see the business value from these investments, spending continues in a virtuous cycle of change. This is typical of transformative technologies like AI which are still in the early stages of adoption, where many early benefits flow to more mature first movers.

AI software platforms spending



Notes:
1. AI software platforms comprise AI life cycle, AI software services, and intelligent knowledge discovery tools
2. Revenue in US$ million/billion
3. CAGR 2023-2027

Later entrants like **India, Malaysia**, and **Indonesia** start from a lower base, and hence show higher growth rates, placing them on the upper left corner of the chart.

In the near term, organizations in many economies will focus on funding their core AI infrastructure (network, compute, and storage), including the necessary security and trust layers. Once the build-out phase is complete, investments will scale for AI initiatives that can deliver true transformational impact.

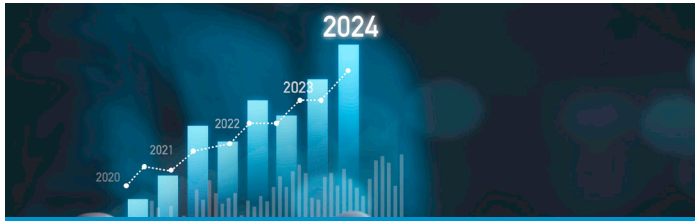
In the longer term, AI spending may be driven by the size of the economy and population as these are the drivers of data – the raw material that powers AI use cases. This suggests that markets like **India** and **Indonesia** will potentially become AI powerhouses of the future.

The future of AI in Asia/Pacific: IDC predictions of AI adoption and investments

By 2025

Majority of A1000 enterprises will allocate over 50% of their core IT spending on AI initiatives leading to double-digit increase in rate of product and process innovations.

- AI is driving a fundamental shift in how enterprises function, meet customers' needs, and bolster productivity, resulting in more than double-digit growth in the rate of production and process innovations. This virtuous cycle of rising business value from AI is leading to a rise in AI investment. With rising IT spending on AI, enterprises need to start thinking carefully now on how to lay the right foundation for future infrastructure integration and scaling for diverse AI use cases, so whatever IT spending on AI invested now is worthwhile down the road.



By 2027

AI regulatory divergence across geographies will create major challenges for A2000 companies, increasing implementation time and effort for sensitive use cases by up to 20%.

- Unlike EMEA, where the EU AI Act provides a comprehensive framework, governments in Asia/Pacific have individual AI regulations, lacking a unified approach. This fragmented landscape contributes to longer implementation time for sensitive use cases and widening AI spending gaps compared to EMEA.
- Although commendable progress has been made in formulating AI policies and regulations across Asia/Pacific, there is a need for governments to collaborate on a unified framework. This ensures that regulations not only protect data and privacy but also facilitate information sharing and boost AI deployment and scaling across markets.

By 2028

10% of A1000 companies will experiment with Artificial General Intelligence (currently speculative) systems that will have a transformative effect on society and create significant opportunities and threats.

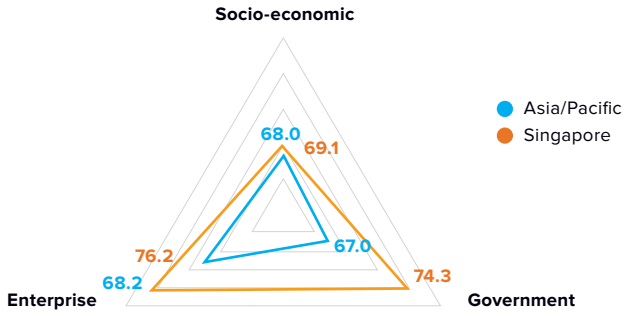
- Artificial general intelligence (AGI) software or machines show human-like cognitive and problem-solving capabilities even when faced with an unfamiliar task. To gauge how close we are to AGI, we need to recognize intelligence as a continuum, where systems are evaluated based on their progression along this spectrum.
- AGI's transformative potential will reshape industries, redefine concepts like intelligence and creativity, and revolutionize the labor market.
- Recent advances have made AI a C-suite and board-level priority and require IT to balance the risks and value of these systems. With AGI, these issues become even more pressing, and organizations need to embark on proactive change management as soon as possible to prepare people and process to embrace AGI systems in the future.

State of AI in Singapore

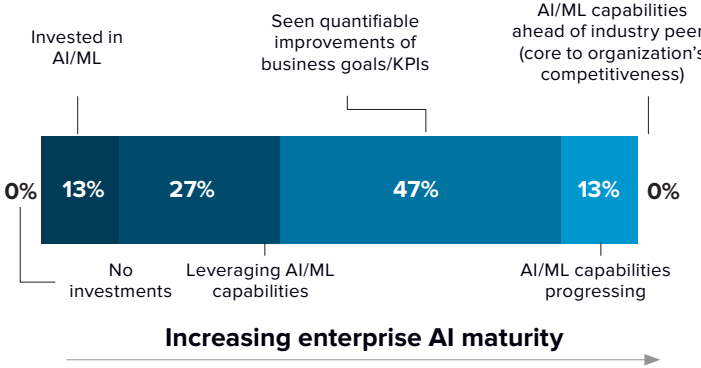
Regional hub status, AI startups, top universities, and government investments give Singapore the edge in AI maturity

But lack of scale and undefined AI regulations may pose challenges to future AI growth

Singapore is currently an **AI Leader** (stage 4), the only economy among the eight surveyed in the IDC Asia/Pacific AI Maturity Study at this stage. The chart below shows how Singapore scores versus the Asia/Pacific average for the dimensions of enterprise, government, and socio-economic. Singapore scores above the Asia/Pacific average for all three dimensions.



How organizations describe their AI/ML-related capabilities



ENTERPRISE

- Singapore's enterprises are some of the most digitally sophisticated in Asia/Pacific, and even in the world. This gives them a foundational advantage of structured data, processes, and technology to progress rapidly in their AI ventures. Key industries such as finance, healthcare, education, and government are successful early adopters of AI.
- Large local enterprises and international firms with regional headquarters in Singapore are planning significant AI investments. The fintech industry is the leader in AI investment in 2023, adopting a wide range of use cases e.g., risk quantification and predictions, market movements, and trade forecasts.
- Competitive compensation and relatively low taxes allow Singapore enterprises to attract top regional AI talent.
- More generally, many enterprises in Singapore have swiftly embraced and implemented AI/ML capabilities. IDC's survey suggests about **87%** of larger enterprises in Singapore employ AI/ML to varying degrees, with about **60%** seeing quantifiable improvements of their business KPIs through their AI/ML capabilities.

GOVERNMENT

- The Singapore government was quick with proactive AI initiatives and investments, and this has positioned the nation at the forefront of AI adoption.
- In 2024, the government announced a $743 million investment over the next 5 years to enhance national AI capabilities, cultivate a more trustworthy and responsible AI ecosystem, and ensure the secure implementation of the Singapore National AI Strategy 2.0 (NAIS 2.0).
- The AI Singapore initiative, established in 2017, brings together research institutions, AI startups, and businesses to collaborate and grow knowledge, create tools, and develop the talent to power Singapore's AI efforts. In addition, the government has included AI in its healthcare guidelines to ensure ethical and responsible AI use, prioritizing patient safety and privacy.
- The government's approach to AI policies balances AI innovation and responsibility, and currently leans toward guidelines and best practices, rather than enforceable regulations. Singapore actively engages in global AI governance discussions, leveraging existing laws like the Personal Data Protection Act (PDPA) and the Model AI Governance Framework to promote ethical best practices. Nevertheless, Singapore, like other governments, is challenged by the need to keep regulations up to date with the pace of AI innovation.

SOCIO-ECONOMIC

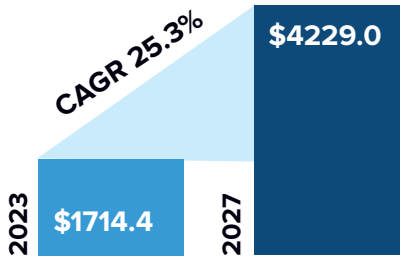
- Singapore is considered one of the most advanced markets in the region for technology adoption, with well-established digital infrastructure, supportive government-led initiatives, and a thriving ecosystem for AI innovation.
- A digitally-savvy population that is adept at digital services and e-transactions creates a welcoming environment for emerging technologies like AI and its myriad applications.
- Tertiary institutions like the National University of Singapore, and Nanyang Technological University are considered some of the best in the world. They collaborate with local industries to offer specialized AI programs, which create a talent pipeline for AI research and development.
- As the smallest market in the study, Singapore's biggest challenge is its lack of scale, and must inevitably innovate faster than its competitors to stay ahead, because as technologies mature, scalability becomes ever more important.
- Like many markets in Asia/Pacific, Singapore's population is aging fast, which generally slows down technology adoption because of talent shortages, and holds back economic growth because of higher welfare costs leading to fewer resources and investment allocated to AI.

Source: IDC Data Driven Enterprise Survey, 2023 (n = 30 for Singapore)

AI spending trends in Singapore

AI spending overall is expected to reach $4.2 billion by 2027 across infrastructure and applications

AI spending in Singapore 2023-2027 ($M)



Note: CAGR is for 2023 to 2027 (4 years)

- Singapore's overall AI spending is forecast to grow at 25.3% CAGR from 2023, reaching $4.2 billion by 2027. The AI software sector will reach about $1.7 billion by 2027 at a 31.8% CAGR, led by spending on AI applications, and on AI applications development and deployment tools. AI software platforms* are expected to grow at the fastest CAGR of 40.5% during the forecast period.
- AI infrastructure investments are projected to grow significantly at a CAGR of 14.8% from 2023 to reach $1.4 billion by the end of 2027, and will prioritize spending in areas such as specialized AI processors, data storage and management, and network and cloud servers, that will serve as a springboard for high-value and data-intensive applications down the road. The expected spending growth, particularly in AI software and infrastructure, indicates a vibrant ecosystem ready for transformative AI applications.

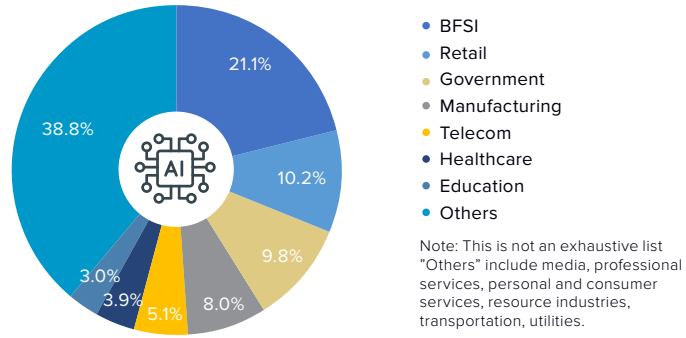
AI spending by use cases

Use Cases	2023 Spending ($M)
AI infrastructure provisioning	448.9
Augmented threat intelligence and prevention systems	130.3
Augmented customer service agents	126.3
Program advisors and recommendation systems	97.8
Digital assistants	91.2

* Not exhaustive

- Singapore's $448.9 million spending on AI infrastructure indicates a foundational strategy to support extensive future AI development. This expenditure will enhance computing resources, including advanced servers and dedicated AI processing units.
- Singapore also invests heavily in augmented threat intelligence and prevention systems. This is because it is a major global financial and business hub, and so faces significant cyberthreats.

AI spending by industry (2023)



Note: This is not an exhaustive list "Others" include media, professional services, personal and consumer services, resource industries, transportation, utilities.

Top industry spenders: BFSI and retail

- Singapore's **BFSI** has historically spent the most on AI, particularly on predictive AI, although GenAI applications are proliferating. Traditional applications such as quantitative trading, financial risk management, sales forecasting, and customer service are being augmented with AI robo-advisors that automate investment management and financial advice.
- AI spending in Singapore's **retail** sector is booming due to the rise of omnichannel shopping, which is reshaping the industry. This requires businesses to invest in AI to better understand and engage with customers in innovative ways. Singapore's advanced infrastructure, tech-savvy population, and competitive retail environment further drive this trend.

*See page 12
Sources: IDC Data Driven Enterprise Survey, 2023; IDC Worldwide Artificial Intelligence Spending Guide, August (V2 2023); IDC Semiannual Artificial Intelligence Infrastructure Tracker, 2023H1, Nov 2023

Singapore must innovate fast and enhance AI regulation to maintain its regional lead

Robust government support and heavy investments in talent enable Singapore to reap the benefits of AI, with many enterprises scaling their AI implementations. Though a regional AI leader, it is constrained by its small size, and hence, it is crucial for Singapore to continue to innovate faster in AI than its competitors to stay ahead. Singapore must also develop a market-leading approach to AI regulations as soon as possible. AI policies and regulations are increasingly essential for responsible AI development, and establishing clear guidelines will mitigate risks, and help ensure ethical AI use.

Top challenges to AI adoption in Singapore

1. **Use case** issues — the selected use cases are not ideal/too complex
2. **Technology** issues — the adopted technology is insufficient/non-performant
3. **Compliance** issues — security, compliance, and explainability related
4. **Vendor** issues — lack of vendor support for critical tools, resources, or processes
5. **Process** issues — lack of organizational support to orchestrate cross-function initiatives

RECOMMENDATIONS

ENTERPRISE

- **Identify the right use cases and technologies**: This remains a challenge for AI adoption by Singapore companies. They should start with smaller-scale use cases (involving embedded AI and/or functional use cases) that deliver quick wins and build enterprise capabilities that can jumpstart other use cases. Stakeholders should define measurable outcomes for these use cases, and make appropriate technology investments to support them.
- **Encourage enterprise-wide AI adoption**: Businesses in Singapore should consider providing resources and incentives specifically for innovation and AI projects across departments to encourage experimentation with AI tools. They must ensure that AI tools and platforms are accessible, and create cross-functional teams to integrate AI into their operations to speed up AI adoption enterprise-wide.

GOVERNMENT

- **Continue to evolve AI regulation guidance**: AI regulatory policies should foster technological advancement while upholding ethical AI practices. While Singapore performs a delicate balancing act between rigid enforcement and promoting AI innovation, regulations and policies must be dynamic, evolving with rapid technological changes. The government should also offer clear direction and examples on the ethical and conscientious use of AI, emphasizing sensitive aspects such as openness, explainability, responsibility, and equity.
- **Encourage the expansion of AI utilization across sectors**: The government needs to push for more AI adoption in sectors where current uptake remains limited. These include telecom, transportation, and utilities. In addition, sectors like healthcare and education, though successful early AI adopters, need to invest more into AI to improve efficiency and effectiveness, and enhance service quality. Support initiatives may include AI-specific funding, tax breaks, and partnership and collaboration programs with academia and industry partners in more AI-mature sectors.

SOCIO-ECONOMIC

- **Prepare for the growing demand for AI skills**: As AI tech and use cases become more mature, deployments will require AI skills on a larger scale. While Singapore is less constrained in its AI talent compared to other economies in the region, it needs to continuously grow the talent pool to cater for increasing demand.
- **Speed up the scaling of AI startup ecosystem**: As a smaller nation, Singapore needs to make up for its lack of scale by speeding up AI innovations. Singapore's status as a hub for AI startups gives it a good head start, but to retain its AI Leader status, the nation must create an environment that provides greater ease and efficiency to scale AI innovations quickly globally. This includes establishing sandboxes for experimentation, access to mentors and industry experts, funding, and facilitating connections with international investors and markets.

Methodology

IDC assessed the current state of AI maturity of eight Asia/Pacific economies by examining three different dimensions — average enterprise, government, and socio-economic dimensions. Each is broken down into a number of attributes listed below:

AI Maturity Dimensions		Attributes
Enterprise	45%	Strategy Technology and data Human capital Process
Socio-economic	40%	Economic and social Talent and skill
Government	15%	Policy Regulations Government investments

Scores for these attributes were based on surveys and secondary data, and weighted to determine overall AI maturity for the market. Average enterprise factors, IDC believes, are the most critical and so are given the highest weightage (45%), followed by socio-economic readiness (40%) and government (15%). Maturity scoring is on a scale of zero to 100, with 100 as the highest possible score.

Enterprise dimension

Strategy factor

- Includes dimensions like innovation and AI strategy.
- Least mature organizations tend to not have a long-term innovation strategy and AI initiatives are often fragmented.
- Most mature organizations often have disruptive AI strategies that are dynamic in nature.

Process factor

- Includes dimensions like business process automation and change management.
- Least mature organizations often lack continuous business process improvement initiatives.
- Business process transformations tend to be iterative in nature and are often embedded in organizational DNA of most mature enterprises.

Technology and data readiness factor

- Includes technology dimensions like cloud, AI and IT modernization and data dimensions like data governance and customer analytics.
- Least mature organizations often lack business data visibility and rely on legacy and uncoordinated groups of IT infrastructure, which can have no or limited focus on leveraging AI and data platforms.
- Data monetization is often a key aspect of business strategy in mature organizations and tend to have a cloud/AI-first strategy driven by cognitive and contextual data inputs.

Human capital factor

- Includes culture, AI program leadership, workforce management.
- Least mature organizations tend to be limited by change management challenges and lack executive support for AI initiatives.
- Mature organizations often have a transformative culture driven by executive leadership with organization-wide participation in AI initiatives.

Government dimension

Policy factor

- Includes dimensions like policy frameworks and governance practices in place to access data and technology.
- Least mature markets often lack capability to meet policy requirements.
- Most mature markets tend to have a defined government policy framework. An AI policy framework helps governments develop rational, robust but supportive policies to fully realize the potential of AI technology and address its challenges.

Regulatory factor

- Includes dimensions like data sovereignty regulatory requirements and governance, risk, compliance software attributes.
- Least mature markets often lack capability to meet regulatory requirements.
- Most mature markets tend to have a defined regulatory framework.

Government investment factor

- Includes dimensions like technology investments, governance, policies and technology initiatives.
- Least mature markets often lack support from government investments to excel in technology infrastructure and support development.
- Most mature markets tend to have a defined investment architecture.

Socio-economic dimension

Economic and social factor

- Includes dimensions like technical education, knowledge management (the process of organizing, using, and sharing information) digital adoption, and GDP.
- Least mature markets tend to not have a long-term knowledge management strategy affecting AI initiatives.
- Most mature markets have technical education and digital adoption as key aspects of government strategy.

Talent and skill factor

- Includes employee skills, future talent pipeline, productivity, data engineering, and data science attributes.
- Least mature markets tend to be limited by change management challenges and a lack of executive support for AI initiatives.
- Mature markets often have a transformative approach to becoming data driven, with organization-wide participation in AI upskilling.

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