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Generative AI
Unlocking the power of Technology, Media, and Telecommunications in APAC

Executive summary

Generative AI ('GenAI'), the automated creation of text, images, videos and vocals, is driving some of the world's fastest growing markets and most disruptive technological advancements.

APAC countries owe their high GenAI growth potential to increasing populations and strong economic development. The market is characterised as follows:

- Widespread investment in GenAI and rapid adoption
- Expansion of AI adaptation supported by government initiatives, and international AI framework collaboration e.g. ASEAN G20
- Strong GenAI regulations such as those announced by China
- Challenges include: risk aversion, insufficient data management capabilities, lack of metrics to measure customer trust, intra-national digital divides/IT skill disparities, and slow-paced digitalization constraints on smaller companies

APAC Technology, Media and Telecommunications (TMT) highlights

The market opportunity for these sub sectors is encouraging:

1. **IT (software services and platforms):** AI can be deployed in much of the software development cycle, with strong potential for code generation from text. GenAI can also make sales processes more customer-oriented, and optimise data centre location, layout and design. APAC's share of the data centre market is set to grow considerably.

2. **Hardware (manufacturing):** GenAI can automate development, quality assurance, maintenance and customer care. The market for new/updated GenAI hardware will continue to grow, with the huge quantities of data used in GenAI processing leading to massive expansion in server and storage requirements. APAC countries are frontrunners in PC/component production and have many data centres, so the region is likely to capture a high market share and drive strong growth.

3. **Semiconductors:** GenAI can automate decision-making, reduce costs, forecast intelligent demand and optimise risk management. Electronic design automation (EDA) suites offered use GenAI to accelerate development cycles via data visualisation. The region is set to maintain its high production share, while expanding into areas such as chip inspection processes.

4. **Media and Entertainment:** GenAI can use natural language processing (NLP) to produce high quality content such as blog posts and product descriptions quickly and cheaply. Media production models can be streamlined by GenAI, rationalizing content creation and customization, reducing creation time and costs, and opening new revenue streams. The global content market exceeds US$1 trillion and steady growth is predicted. Japan is a leader in home video games; South Korea dominates live action and music; China excels at PC and smartphone games; and Indian films are highly rated. The region is linguistically diverse and struggles with English content: GenAI is mitigating this, allowing quick and easy scaling of APAC content overseas. Given the large potential numbers of APAC creators, and their expanding audiences, the market for GenAI media in the region is promising.

5. **Telecommunications:** GenAI is revolutionizing the industry by enhancing customer support, building personalised engagement, minimising wait times, facilitating operator training, automating repetitive tasks, optimizing network strategies, reducing costs and improving customer satisfaction and retention. GenAI could lead to market re-invigoration; new phones incorporating GenAI are likely to reverse declining smartphone sales. In APAC, significant business opportunities are associated with LLMs catering to local languages.

6. **Sports:** GenAI can be used to produce compelling content, translate posts into multiple languages and personalize offers while maintaining brand values. GenAI also has a role in the evolution of virtual reality (VR) and the metaverse, for game viewing, and tournament operation. Large populations and strong economic growth in APAC are set to drive market expansion in sports participation and viewing.

The future of GenAI

General trends:
- Rising multimodality, fusion between real and virtual worlds, robotics, energy savings, applications and functions
- Tightening of regulations on data security, privacy and copyright compliance as governance improves
- Balancing of job losses by newly emerging opportunities

Implementation considerations:
- Protection of data, user privacy, trade secrets and intellectual property (IP) is vital.
- Training data bias must be eliminated to avoid discriminatory outcomes.
- Organisations' policies should ensure systems are fair, safe, accurate, transparent and compliant.
- Human monitoring of GenAI content is essential to reinforce conformity to market standards.

Challenges:
- Concerns around intellectual property (IP) arising from the vast amounts of proprietary data used in general-purpose models
- Inaccurate or fabricated information presented by GenAI: care must be taken when evaluating system outputs
- Limitations in training data: gaps between existing GenAI platforms and hardware design could result in errors
- Securing the enormous resources required to train LLMs
- Difficulties in obtaining data due to proprietary information and privacy issues
- Legal compliance requiring transparency, accountability, prevention of licensing and copyright infringement and consent for data use
- User preference mismatch: GenAI content not aligned with brands or players risks loss of fan engagement

Conclusion

Thanks to its expanding population and strong economic growth, APAC's GenAI markets are set to grow faster than in the west. The business potential for GenAI use in the APAC TMT industry is substantial, and the region can seize great opportunities in the development of LLMs and platforms.

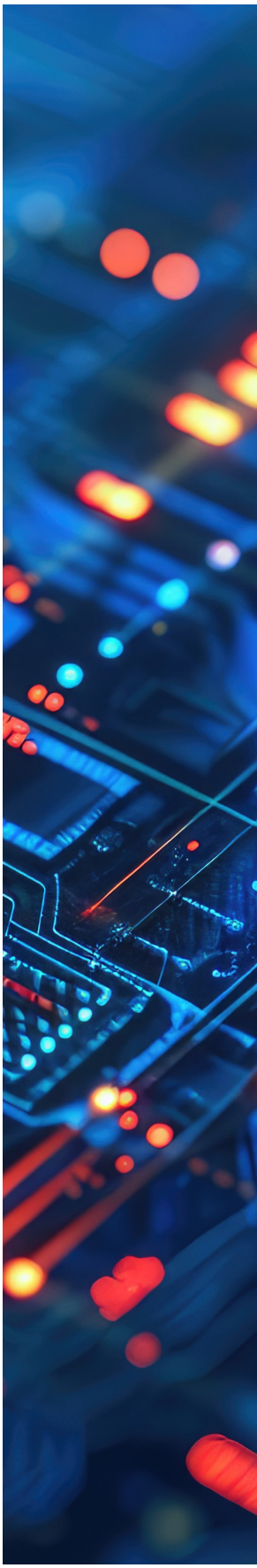
Deloitte recommends three areas when considering GenAI adoption:

1. **In-house or general purpose?** Deciding whether to build GenAI models in-house or use bought-in platforms is important, likewise choosing between use of internal or external resources and data. A definitive strategy on how to build a business model and enhance competitiveness and profitability is recommended. Increasing GenAI autonomy and versatility will necessitate decisions around reinforcing internal capabilities, talent, and internal and external ecosystems.

2. **Agility:** The speed of GenAI development and its related regulations means businesses must adopt agile technical and managerial response practices. GenAI itself can help prevent the recurrence of scandals and misconduct, and may be useful in creating compliance and management plans.

3. **Rapid response:** Global events in the GenAI hardware domain are unfolding rapidly, especially in the semiconductor industry, as countries push to onshore manufacturing. Countries and organisations must factor these developments into their strategies around collaboration with the changing ecosystem. Data centre energy inefficiency must also be addressed. Managing this effectively could give APAC organizations competitive advantages.

GenAI is a powerful technology and APAC leaders must act fast to plan, build, implement and operationalise solutions to remain competitive.




AI

Introduction

Generative AI: unlocking the power of technology, media and telecommunications in APAC

The use of GenAI is now booming, with applications extending beyond internal company operations to customer-facing functions. This is driving market growth. While North America is currently the largest market, the Asia-Pacific region (APAC) is expected to grow at a higher rate than the global average. This is due to: expanding economic and population growth; its ability to cater to diverse languages; and the high potential for adoption in industries where the region has a competitive edge.

The application of GenAI is advancing across various industries and sectors, though strong growth is anticipated in the use and commercialization of GenAI in the Technology, Media, and Telecommunications (TMT) industry. The ripple effects are expected to be significant. This is because the TMT industry includes sectors such as semiconductors and hardware, which are the foundations of GenAI, as well as communications, and directly applicable fields like software, media, sports and entertainment. APAC has leading businesses and technology in many of these fields.

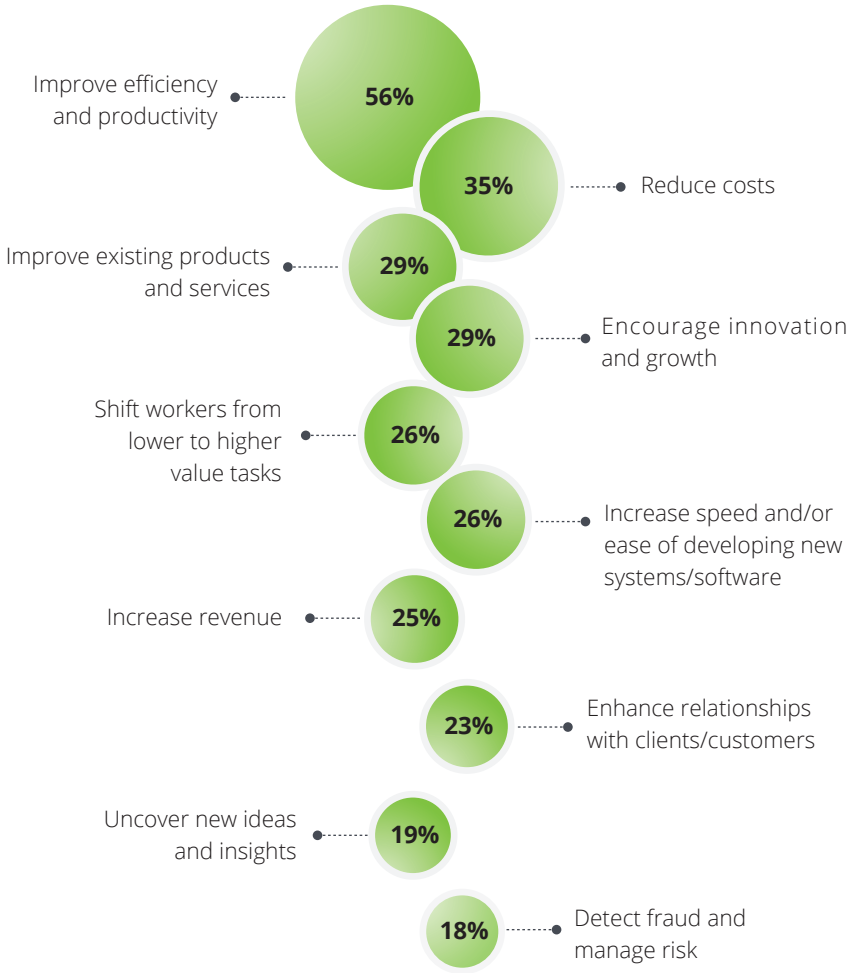
Drawing from quarterly Deloitte surveys of AI leaders in business, tech and public sectors, this white paper focuses on the application and commercialisation of GenAI in the TMT industry in APAC, with commentary and recommendations for TMT business leaders. We hope the report will help leaders understand how GenAI can transform their day-to-day business and operation.

3. The impact of GenAI on the global economy

Corporate GenAI initiatives

To help track the pace of GenAI change and adoption, Deloitte conducts quarterly surveys to capture the sentiments of AI leaders in business, technology and the public sector. In the first survey, October to December 2023, 2,835 leaders took part. A high proportion cited "Improvements in efficiency and productivity, as well as cost reduction" as key benefits they hoped to achieve in implementing GenAI. (Chart 1). Many expect to realize these benefits in less than three years.

Chart 1: Main benefits companies expect from GenAI



Source: Deloitte, "Now decides next: Insights from the leading edge of generative AI adoption - Deloitte's State of Generative AI in the Enterprise Quarter One report," accessed on 2024/01 https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consulting/us-state-of-gen-ai-report.pdf

On the other hand, many respondents had concerns regarding the governance of GenAI, in particular, issues around inaccurate results, intellectual property, explicability, transparency, misuse of client or customer data, and regulatory compliance. While most reported a high level of preparedness in technology infrastructure and strategy, some indicated their organizations are not adequately prepared to manage talent and risk, both considered critical areas.

The GenAI-driven market is expanding rapidly

Since the launch of ChatGPT in November 2022, the subject of GenAI has gained traction, with numerous corporate initiatives emerging in response. Governments, also keen to harness the technology's commercial potential, are developing guidelines, regulations, and national strategies.

Deloitte predicts that the global market for specialized chips and server hardware for GenAI will exceed US$50bn in 2024. Although AI chip market forecasts for 2027 range from US$110bn to US$400bn, it is clear the market is growing at speed. Deloitte expects nearly all enterprise software companies to incorporate GenAI into at least some of their products in 2024, and the resulting revenue increase will reach US$10bn.[1] In the medium term, markets for application-related software and solution services are likely to expand. Hardware, such as smartphones, servers, and storage, will also continue to grow.[2]

Factors driving global market growth and the impact of GenAI include:

- **Expansion of the GenAI market leads to the growth of global GDP and related companies**
  Growth of GenAI is driven in the short term by demand for training infrastructure and in the medium term by a shift towards inference devices for large language models (LLMs), digital advertising, and specialized software and services.
- **In the short term, the market for training LLMs grows**
  GenAI infrastructure, primarily used for LLM training will become a driving force for revenue growth. This is mainly due to the expanding GenAI solutions market, increased investment in AI technology by cloud providers, rises in AI hardware and software services, and more digital advertising driven by GenAI.

Investment in startup companies and the increase in unicorn companies

GenAI startups are attracting attention globally, with these significant developments:

- **Investment surged in 2023, but many startups are still early stage**
  Over the past five years, startups focusing on GenAI have raised substantial funds from investors, particularly in 2023. The growth in GenAI investment is substantial, given that overall venture capital (VC) funding is declining. However, many of the world's GenAI startups are either still early stage or not yet raising funds through equity, suggesting extensive corporate growth is yet to come.
- **US startups dominate the market and big tech firms have significant involvement in top deals**
  Most startups that have secured funding rounds are from the US, but companies from Germany, France, China and Israel also feature. Big tech companies are investing heavily in early-stage startups.
- **Many GenAI companies have hit unicorn status**
  The surge in GenAI startup investment has given rise to increasing numbers of unicorn companies (those valued over US$1 bn). This growth is not limited to big players such as OpenAI, but also lesser-known outfits. Companies that devise semiconductors and apps in the wider GenAI ecosystem are also becoming more valuable.

[1] Deloitte, "Gen AI chip demand fans a semi tailwind … for now." 2024/01: https://www2.deloitte.com/xe/en/insights/industry/technology/technology-media-and-telecom-predictions/2024/generative-ai-chip-market-to-reach-40-billion-in-2024.html

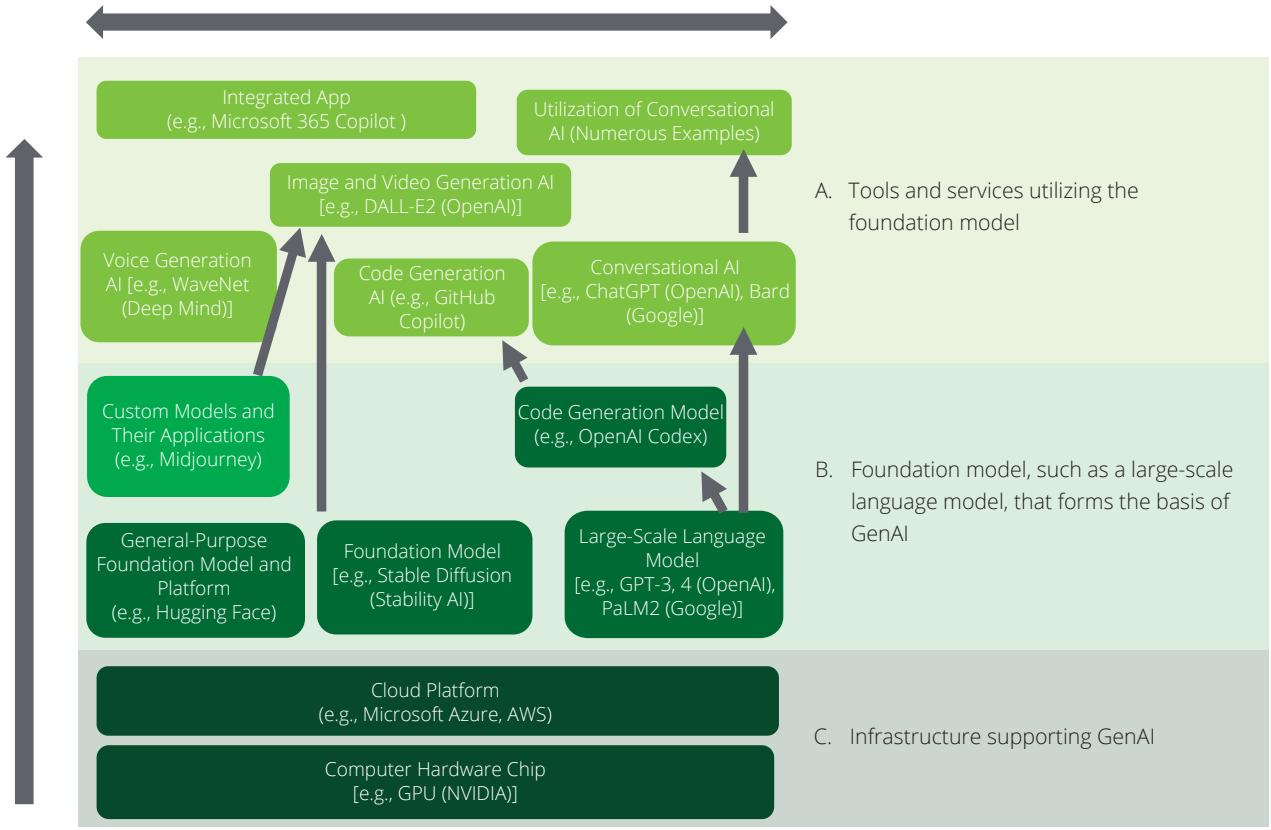
[2] Deloitte, "Generative AI and enterprise software: What's the revenue uplift potential?." 2024/01: https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2024/generative-ai-chip-market-to-reach-40-billion-in-2024.html.

Advancements in ecosystem development via collaborations between big tech and startups

- **Big tech companies support the infrastructure and platforms of GenAI businesses**
  OpenAI's GenAI chatbot tool, ChatGPT, is facilitated by the company's large language model (LLM). There are also image, video, code, and voice generating AIs. Linking the different types has resulted in a move towards multimodality. Various applications and solution services are being produced using these technologies. Startups, rather than large corporations, are primarily engaged in these areas of business development (area A and B in Chart 2).

The supporting infrastructure for these tools, however, requires high profit-margin graphics processing units (GPUs), which are incorporated into cloud platforms and data centers. NVIDIA has a high share of GPUs. Big tech firms, like Microsoft, Google Cloud and Amazon, not only own the key supporting technologies, but also own businesses (area C of Chart 2). They increase their share of the GenAI market by investing in startups in areas A and B and collaborating vertically.

Chart 2: The GenAI market structure



Source: Kuniyoshi Mabuchi, "The Impact of Generative AI" (2023)

- **A new ecosystem is developing through collaboration between big tech and startups**
  Collaboration between big tech companies and emerging startups leads to the development of mutually beneficial value chains and enables more effective implementation of GenAI. Alongside the vertical collaborations (Chart 2), ecosystems are also developing in the following areas:
  - Effective construction of AI hardware and software in the cloud
  - Use of external data in the training of GenAI models
  - Time reduction in the fine-tuning of GenAI models
  - Collaboration for the implementation of GenAI software and services

Through investment and strengthened partnerships with startups, big tech companies are not only developing foundation models, but also enhancing app development, service deployment, and access to GenAI chips, cloud, and data centers.

4. Trends in GenAI business in APAC

AI adoption has been bolstered by government support in APAC

The APAC is a top destination for GenAI growth due to its increasing population and strong economic development. The surge in GenAI use and investment across the region has been driven by government policy support, infrastructure initiatives, and international cooperation from entities such as ASEAN and G20. However, there are also specific challenges facing the region (Chart 3).

Chart 3: Trends in the APAC GenAI market

Trend	Overview
Investment and rapid adoption of GenAI	• Many companies are investing in GenAI technologyw or considering potential use cases. • Generative AI improves efficiency and drives business model innovation for companies. • Many IT business leaders believe that GenAI will play a significant role in their organisations.
Expansion of AI adaptation	• Improvements in government infrastructure and initiatives are leading to rapid progress in GenAI. • Increased investment, and international collaboration on AI frameworks, including ASEAN G20, are strengthening the ecosystem.
Strong government support and regulation	• China has announced regulations on GenAI, emphasizing its controlled use, and socialist values.
Challenges	• Insufficient infrastructure, data management capabilities, and risk aversion could compromise companies adopting GenAI. • Where multinational companies (in APAC) have prioritized customer trust, they have not proposed metrics to measure it. • The digital divide within APAC countries and the disparities in IT skills could negatively impact GenAI implementation. • There are many small- and medium-sized businesses wishing to adopt GenAI, but they are constrained by the relatively slow pace of digitalization compared to that in large corporations.

Sources:

- ASEAN, "ASEAN Guide on AI Governance and Ethics", 2024/2: https://asean.org/wp-content/uploads/2024/02/ASEAN-Guide-on-AI-Governance-and-Ethics_beautified_201223_v2.pdf
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- AMRO, "ASEAN+3 Regional Economic Outlook 2024, Special Feature: ASEAN+3 and the Economic Impact of Generative AI", 2024/4/8: https://amro-asia.org/wp-content/uploads/2024/04/AREO-2024-C2-Special-Feature.pdf
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Trends in GenAI use in APAC companies

The scale and timing of GenAI impact varies by industry: finance, IT, and media industries are expected to be the most affected. Deloitte's 2024 State of Generative AI in the Enterprise research surveyed 487 APAC business leaders from Japan, Korea, India, Singapore, and Australia. It found that many companies are implementing GenAI across key areas such as IT, cybersecurity, marketing, sales, customer service, product development, R&D, strategy, and operations. IT companies, notably, aim to leverage GenAI beyond coding to drive IT operations and management efficiency in this cost-sensitive region.

Management of GenAI is still developing, however. Only 20% of APAC companies said they are highly prepared in terms of talent and risk, while around 40% declared readiness in technical infrastructure and strategy.

Employees see GenAI as an opportunity to work more efficiently and free up time to learn new skills. In Deloitte's 2024 GenAI in the Asia Pacific report, more than 11,900 employees and students in the region were surveyed. Forty-three percent of employees deploy GenAI in their work; 54% use time saved to complete other tasks; and 45% use it for learning and skill development. It is crucial that companies support their employees in optimizing the use of generative AI, and both parties must work together to manage the changes it brings. Chart 4 summarizes these trends in companies.

Chart 4: Trends in the use of GenAI in APAC companies

Trend	Overview
Industries impacted by GenAI	• Most impacted in early stages: finance, IT, communications and media, professional services, and education • Most impacted in future: government, public services, healthcare, real estate, and art
Key areas of application in businesses	• Many companies are using GenAI in IT, cybersecurity, marketing, sales, customer service, product development, R&D, strategy, and operations, followed by supply chain and manufacturing. • Progress is being made in finance, legal affairs, and human resources, but many companies are still in the evaluation stage.
Talent development and skill enhancement	• 40% of companies are focusing on talent development: educating employees to master GenAI, and hiring tech talents to advance GenAI initiatives. • Many employees view this as an opportunity to improve their efficiency and productivity, and to acquire new skills – a trend more evident in developing countries.
Risk management	• About half of companies are establishing governance frameworks for the use of GenAI tools/apps, adhering to compliance through regulations and requirement monitoring, as part of their risk management.

Sources:
- Deloitte, "Now decides next: Insights from the leading edge of generative AI adoption Deloitte's State of Generative AI in the Enterprise Quarter one report" 2024/01: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/consulting/us-state-of-gen-ai-report.pdf
- Deloitte Insights, "Generative AI in Asia Pacific: Young employees lead as employers play catch-up", 2024/5: https://www2.deloitte.com/us/en/insights/topics/emerging-technologies/generative-ai-adoption-asia-pacific-region.html

GenAI trends by country

Looking at development trends, it is evident that each country has unique strengths, such as AI semiconductor production and LLM development (Chart 5).

Chart 5: Country-specific trends in GenAI

Country	Overview
Japan	• There is growing appetite among organizations to adopt GenAI, with national AI strategies and government-backed data center investment plans being discussed.
South Korea	• The adoption rate of AI in enterprises is high, and the industrial use of GenAI is expected.
Singapore	• Corporate AI adoption is progressing, and national pilot projects are underway. • To strengthen AI governance, Singapore has examined the risks and opportunities of GenAI, issued discussion papers, and launched new initiatives.
Taiwan	• Production of chips for GenAI is progressing.
China	• Digitalization is progressing, with advances in government-backed R&D initiatives, regulatory developments, and corporate AI adoption. • Financial services, retail, and high-tech sectors account for one-third of the country's AI market. • Major internet companies have announced AI bots and LLM applications to compete with OpenAI's ChatGPT.
Australia	• A foundation for GenAI in R&D, regulatory systems, and the startup ecosystem has been established government agencies plan to collaborate with industry to help companies implement "responsible AI". • Domestic companies are developing ecosystems, providing comprehensive AI-related services.
New Zealand	• The government is advancing digitalization and open data.
Malaysia	• Corporate adoption of GenAI is progressing.
Indonesia	• The government's response to AI is progressing, but is still in the exploratory stage for GenAI.
Thailand	• The government's response to AI is progressing, but is still in the exploratory stage for GenAI.
Vietnam	• Corporate interest in GenAI is increasing, but is delayed due to lack of talent.
Philippines	• The National AI Strategy Roadmap was formulated in 2021. • The introduction of GenAI to companies may see more progress in future.
India	• The rate of AI adoption in companies is high and the number of startups is increasing. • The number of GenAI startups is skyrocketing, as is investment.

Sources: Created by Deloitte Asia Pacific (created from publicly available information)
- OECD, "National AI policies & strategies," accessed on 2024/4: https://oecd.ai/en/dashboards/overview
- Webpages of each country

Major companies in China, India, and Japan stand out, as do startups in China

- **Trends among major companies**
  - Among the major APAC companies entering the GenAI industry, many from China, India, and Japan stand out.
  - Chinese companies are not only meeting domestic demand with technologies from the US (and other countries) but also developing and deploying competitive technologies of their own, with Baidu, Alibaba, and Huawei playing important roles.
  - Japan also has many, mainly large, companies, that are using GenAI in their operations. Backed by government support, IT companies are starting to develop LLMs, establish data centers, and build supercomputers.
  - Indian IT service companies are integrating GenAI, mainly focusing on enhancing automation functions.

- **Startup trends**
  - GenAI startups continue to be attractive targets for venture capital. However, investment is still limited compared to western countries. As the APAC GenAI market is still immature, it is expected fundraising may be low over the next 18 to 24 months.
  - Currently most APAC GenAI startups that have successfully secured funding are from China. 2023 saw a surge in Chinese startups specializing in GenAI infrastructure (LLM).
  - In Japan, fundraising from venture capital is limited and few startups progress. However, in the field of GenAI, startups providing services, responding to security and developing LLMs are multiplying.
  - In India, the number of startups is growing and those using GenAI to enhance customer engagement are starting to emerge. In Singapore, companies that provide GenAI-driven chatbots have been established.

5. Use cases in the TMT industry and their future impact

In this section, we present the key value chains, use cases and impacts of GenAI across six sectors of the APAC TMT industry, alongside future opportunities and challenges.

1) IT (software services and platform)

There are four main stages in the IT industry software development value chain: planning & market research, software development, sales, and customer success activities. AI can be deployed in many parts of the software development cycle, with strong potential for code generation from text.

The software lifecycle not only includes software development, but also maintenance, replacement, enhancement, procedure explanation, and planning. In addition to being commercialized as sales and services, software can also be used for in-house operations. In general, it is essential to establish an effective governance mechanism that maintains code quality, while prioritizing data privacy and compliance, ensuring transparency and ethical practices, and reducing risk. Another strong potential application in the IT industry is using GenAI to optimize data centers, including planning the most efficient location, layout and design.

GenAI has the potential to transform, via automation, all processes required for planning, development, quality assurance, and maintenance in the IT industry. It could also guide the work processes involved in sales and customer success towards a more customer-oriented approach (Chart 6).

Chart 6: Use cases in the IT industry

Value chain in the IT industry

	Planning & market research	Software development & maintenance	Sales activities	Customer success activities
Challenges in the Industry within the value chain	• Difficult in identifying appropriate technologies for projects and setting realistic timeline and budget • Chanllenging in keeping up with industry trends, time-consuming in data collection and analysis	• Responding to coding errors, system integration, and compliance is challenging • Much time is taken up by manual and repetitive tasks • Often see delays in software development due to a shortage of skilled labour	• Problems in reaching the target market and in managing customer relationships • Some tasks are still carried out manually, such as data entry and follow-up	• Difficulties in managing customer complaints and maintaining customers with limited resourcesa • Data entry and follow up require time-consuming manual input
What GenAI can do	• Automate data collection and analysis and provide real-time insights • Analyze project requirements and suggest the most appropriate technologies	• Improve productivity significantly, shorten development periods, improve code quality, accelerate code review comaments and strengthen security • Automate repetitive tasks such as code generation of common patterns, automatic code formatting, and generation of unit tests	• Provide deep insights into customer behaviors, preferences, and purchasing patterns by analyzing large amounts of data, in addition to automating routine sales processes such as lead generation and • Follow-up, allowing sales to focus on strategic tasks • Strengthen collaboration between teams	• Provide real-time customer service through chatbots and virtual assistants enabling immediate responses to customer inquiries and problems
Capabilities and enablers needed for implementation	• Infrastructure to build AI systems • Professionals with specialized statistical/AI skills and industry knowledge • Effective measurement and management of software engineering processes, enabling continuous integration and deployment	• Integration of existing development tools with AI systems • Code data for training AI models • Professionals with specialized coding knowledge and AI skills • Establishment of governance mechanisms to maintain code quality	• Integration of existing CRM systems with AI systems • Customer data for training AI models • AI training for sales teams	• Integration of existing support systems with AI systems • Customer data for training AI models • AI training for customer success teams

Source: Deloitte Asia Pacific

- **How will GenAI transform the business of this industry?**
  The global market for GenAI is expected to grow rapidly after 2025, with the focus shifting from hardware and chips to software. The service market using software is also likely to expand steadily, as is the market for GenAI data centers.
- **What opportunities will GenAI bring to this industry in APAC?**
  Currently, applications are the primary business opportunities. Software aside, the market for solution services is projected to expand gradually. Although North America dominated the data center market in 2020, the APAC share is expected to grow considerably in the near future. In Hokkaido, Japan, data center development for the creation of domestic GenAI is already progressing.[3] A similar situation is likely to arise not only in China, Singapore, and South Korea, but also in Malaysia, Thailand, and Indonesia. The share of data centers purpose-built for GenAI will also rise.

2) Hardware (manufacturing)

Design and production in hardware manufacturing includes circuit boards, microchips, circuit diagrams, scanners, processors and sensors, which are hardware components and computer parts. Hardware design is a complex process involving many teams, including verification, mechanical product design, quality control, reliability and compliance. When applying GenAI in this field, choosing the appropriate architecture can be a compliance challenge with different algorithms and models.

GenAI offers promise for hardware companies, enabling automation in development, quality assurance, and maintenance/customer care. Ultimately this will improve productivity, accelerate product speed and streamline testing and maintenance processes (Chart 7).

Chart 7: Use cases in the hardware (manufacturing) industry

Value chain in the hardware manufacturing industry

	Research & development	Design & production	Distribution & logistics	Sales & marketing	After-sales service
Challenges in the industry within the value chain	• Identifying appropriate technologies is difficult, and it takes time and effort to set realistic timelines and budgets, update industry trends, collect and analyze data, and construct prototypes	• Lack of agility in electronic design automation tools • Designers have many tasks (component creation, library and model development, data sheet interpretation, component selection, etc.) and cannot concentrate on core assignments	• Difficult to ensure logistics efficiency and deliver products quickly	• Issues include identifying potential customers, understanding customer needs, persuading customers to buy, and manual tasks such as data entry and follow-up	• Difficult to retain customers, upsell and cross-sell, and handle customer feedback and complaints at a high-quality level
What GenAI can do	• Predict market trends from a large and diverse set of multimodal data analysis approaches, and automatically create product prototypes • Predict potential problems and solutions and optimize the testing process • Provide initial design ideas	• Reduce the burden on designers by optimizing the product design process • Predict defects and enhance quality management • Provide training assistance, design advice, feedback, analysis, and suggestions	• Predict the most efficient routes to optimize logistics, automate the planning of delivery routes based on factors such as traffic and weather, and predict optimal stock levels to improve inventory management	• Analyze market data to predict what attracts consumers, optimize marketing strategies, and predict consumer behaviors to automate sales processes	• Automate customer services that handle general inquiries and claims, analyze product usage data to predict maintenance needs, and predict and plan returns and repairs
Capabilities and enablers needed for implementation	• Infrastructure to build AI systems • Professionals with specialized electrical engineering/AI skills and industry knowledge • AI training for existing engineers	• Integration of existing development tools and data in the metaverse space • Professionals who can Integrate UX/design • Hardware data for training AI models • Large investment in initial setup costs and maintenance	• Integration of existing supply chain management systems with AI systems • Real-time data from the entire supply chain	• Integration of existing CRM systems with AI systems • Customer data for training AI models • AI training for sales and marketing teams	• Integration of existing CRM and customer service systems with AI systems • Customer data for training AI models

Source: Deloitte Asia Pacific

[3] DTFA Institute, "Competition for Domestic LLM Development Draws Attention with Generative AI: Focus is not only on 'Japanese,'" accessed on 2023/09/29; https://faportal.deloitte.jp/institute/report/articles/000862.html

- **How will GenAI transform the business of this industry?**
  The market for GenAI hardware depends on considerable upfront investment. Although the software market is forecast to surge after 2025, it is still anticipated that the market for new and updated GenAI hardware – PCs, smartphones, head-mounted displays, servers, storage etc. – will continue to experience steady growth. An exceptionally large expansion in server and storage requirements can be expected to accommodate and manage the immense quantities of data used in GenAI processing and execution.
- **What opportunities will GenAI bring to this industry in APAC?**
  APAC countries, including Japan, are front runners in the production of hardware including personal computers (PCs) and their components. The region also has many data centers and is a major market for servers and storage, making it better positioned to lead the GenAI hardware market than the software market. It is likely to capture a high market share and drive strong growth. This will have an appreciable influence on peripheral hardware markets, such as inspection and manufacturing equipment.

3) Semiconductors

Research and development (R&D) is critical in the semiconductor industry. Key focus areas for innovation in materials, manufacturing processes and devices include improvements in lithography technology, exploration of transistor architecture, enhancement of integration technology, and optimization of design automation. The goal is to develop more efficient, powerful and energy-efficient semiconductor devices to support the future of electronics. However, semiconductor R&D specialists face many challenges in their efforts to improve device performance while reducing manufacturing costs. GenAI is expected to help.

Specifically, GenAI can support businesses in optimizing supply chains, automating decision-making, reducing costs, forecasting intelligent demand, reducing risk assessment and optimizing risk management. Some companies provide Electronic Design Automation (EDA) suites that use GenAI.[4] These drive efficiency improvements, accelerate development cycles and reduce overall costs for major semiconductor companies. They also support the discovery of design challenges and areas requiring refinement, strategic direction, design performance, and productivity improvements through data visualization. GenAI models require meticulous data collection and cleaning necessitated by complex semiconductor design. Businesses should seek guidance on the latest tools that can streamline and speed up these tasks.

[4] "Synopsys Spreads AI Throughout Its Chip Design Tools", U.S.News,2023/3/29: https://www.usnews.com/news/technology/articles/2023-03-29/synopsys-spreads-ai-throughout-its-chip-design-tools

In the semiconductor industry, GenAI can be used to accelerate design and optimize manufacturing, installation, repair/maintenance, and knowledge management functions (Chart 8).

Chart 8: Use cases in the semiconductor industry

Value chain in the semiconductor industry

	Research, development, and design	Procurement & manufacturing	Sales & marketing	After-sales service
Challenges in the industry within the value chain	• Identify appropriate technologies, setting realistic timelines and budgets, updating industry trends, and collecting and analyzing data takes time and effort • Shortage of design personnel with advanced specialized knowledge, while design difficulty is increasing for cutting-edge applications such as data centers and smartphones	• Problems around demand forecasting in procurement and chronic shortages/surpluses due to commonality of components • Difficult to fine-tune production parameters because of differences between test lines and actual mass production environments	• Difficult to predict market demand and develop appealing marketing strategies for consumers • A chronic shortage/ excess of finished product inventory due to fluctuations in customer order forecasts	• Customer retention, upselling /cross-selling, and handling customer feedback complaints can be laborious • Providing high-quality and efficient after-sales service can be expensive, especially for complex products
What GenAI can do	• Partially automate the product design process and generate design options based on predefined parameters • Accelerate the prototyping process using machine learning to predict optimal circuit layouts for performance, power consumption, and cost • Create chip floor plans and advanced designs	• Optimize supplier networks and demand forecasting and help in making efficient procurement decisions • Coordinate real-time planning, proactively create plans, and improve defect detection rates through anomaly detection • Simulate yield optimizations and fine-tune production parameters	• Can be used for market trend analysis, consumer behavior prediction, and formulation of targeted marketing strategies	• Enable automated customer retention strategies, opportunities for upselling and cross-selling, and efficient management of customer feedback and complaints • Automate customer support through chatbots, predict maintenance needs, and optimize repair processes
Capabilities and enablers needed for implementation	• Semiconductors for AI that learn from large amounts of data, and software for designing them • Professionals who have design and industry knowledge as well as sufficient discernment to judge the results of AI simulations	• AI infrastructure capable of handling many variables and software • Processing servers equipped with high-performance semiconductors • Preparation of a secure network infrastructure that collects data from manufacturing equipment and factories	• Integration of existing CRM systems with AI systems • Customer data for training AI models	• Integration of existing CRM and customer service systems with AI systems • Customer data for training AI models

Source: Deloitte Asia Pacific

- **How will GenAI transform the business of this industry?**
  Deloitte found that the world's leading semiconductor companies spent approximately US$300 million (mn) on AI tools for chip design in 2023. This is set to surpass US$500mn in 2026.[5] Exponential growth is also predicted in the overall market for specialized chips and server hardware for GenAI.[6]

- **What opportunities will GenAI bring to this industry in APAC?**
  Major semiconductor manufacturers have worked AI into their own chip designs. Specialized GenAI chips require advanced technologies from around the world, but they are still mainly manufactured in Asia, and this tendency is highly likely to become more concentrated in future. The market for image processing semiconductors (GPUs) is monopolized by a major US fabless (fabrication outsourcing) company, which contracts foundry companies in the APAC to manufacture its products, resulting in a high production share in Asia.

  Asian and Japanese companies are also rapidly expanding their market share in high-growth peripheral markets, including the manufacturing and inspection processes of semiconductors and the packaging of semiconductor chips for GenAI.

[5] Deloitte, "AI in chip design: Semiconductor companies are using AI to design better chips faster, cheaper, and more efficiently", 2022/01: https://www2.deloitte.com/uk/en/insights/industry/technology/technology-media-and-telecom-predictions/2023/ai-in-chip-design.html

[6] Deloitte, " Gen AI chip demand fans a semi tailwind ... for now." 2024/01: https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2024/generative-ai-chip-market-to-reach-40-billion-in-2024.html

4) Media and entertainment

Content developers follow defined strategic processes, including researching, analyzing, producing, editing, optimizing, publishing, and promoting output such as blog posts and videos. This enables the planning, creation, distribution and review of content that is tailored to meet audience requirements and intended purposes. Traditional production processes have had long cycles, requiring collaboration between multiple teams and stakeholders. Generative AI, however, can automate much of this, helping to reduce production time and costs.

Through natural language processing (NLP), GenAI can create high-quality content such as blog posts, media content and product descriptions in considerably less time than people, while integrating human creativity. It can also improve existing content by analyzing data patterns and user feedback. Building from AI-generated content, it can ensure consistency with brand principles and appeal to target markets. Interactive GenAI tools like ChatGPT can support content ideation, effective customer engagement and personalized conversation experiences through creative proposals. Moreover, image-generating AI can be used to create visuals, including graphics, images, art forms, and videos.

GenAI has the potential to streamline production models in the media and entertainment industry, significantly rationalizing content creation and customization, reducing creation time and delivery costs, and opening new revenue streams (Chart 9).

Chart 9: Use cases in the media and entertainment industry

Value chain in the media and entertainment industry

	Content development	Content production	Marketing & PR	Delivery optimization
Challenges in the industry within the value chain	• Generating creative ideas is tricky, scriptwriting and storyboarding take time, and planning is complex • In saturated markets, predicting what kind of content might resonate with viewers can be difficult • Struggling with prioritizing and allocating resources for content creation	• Production takes time and money, impacting final products • Manual work consuming a lot of time and resources • Many variables, such as high production costs, time-consuming editing processes, and complex post-production tasks	• Identify target audiences, dealing with high advertising costs, and managing public relations require much effort	• Difficult to predict viewer behavior, manage multiple delivery channels, and optimize content delivery
What GenAI can do	• Support idea generation, automate scriptwriting and storyboarding, and streamline pre-production planning • Analyze trends and viewer preferences to suggest content that is likely to succeed, and prioritize resource allocation	• Optimize production schedules, automate editing tasks, and make certain repetitive processes in post-production (such as generating subtitles, translating, applying automatic image processing, creating teasers, etc.) more efficient and cost-effective	• Automate market research, optimize the use of advertising campaign budgets, and manage public relations • Refine and automate secondary tasks for those in charge, such as measuring the cost-effectiveness of advertisements and operations	• Predict viewer behavior, manage multiple delivery channels, optimize content delivery, and maximize audience reach
Capabilities and enablers needed for implementation	• Integration of existing production systems with AI tools • Professionals with specialized skills as content business producers utilizing AI • Clear guidelines and agreements on how far to entrust content development to AI • Upskilling and reskilling of production staff to collaborate with AI		• Integration of existing CRM systems with AI systems • Comprehensive viewer data for training AI models • A system to consistently evaluate, improve, and develop the performance of AI-generated content based on engagement metrics, conversion rates, and viewer comments	• Integration of existing optimization systems with AI systems • Comprehensive viewer data for training AI models

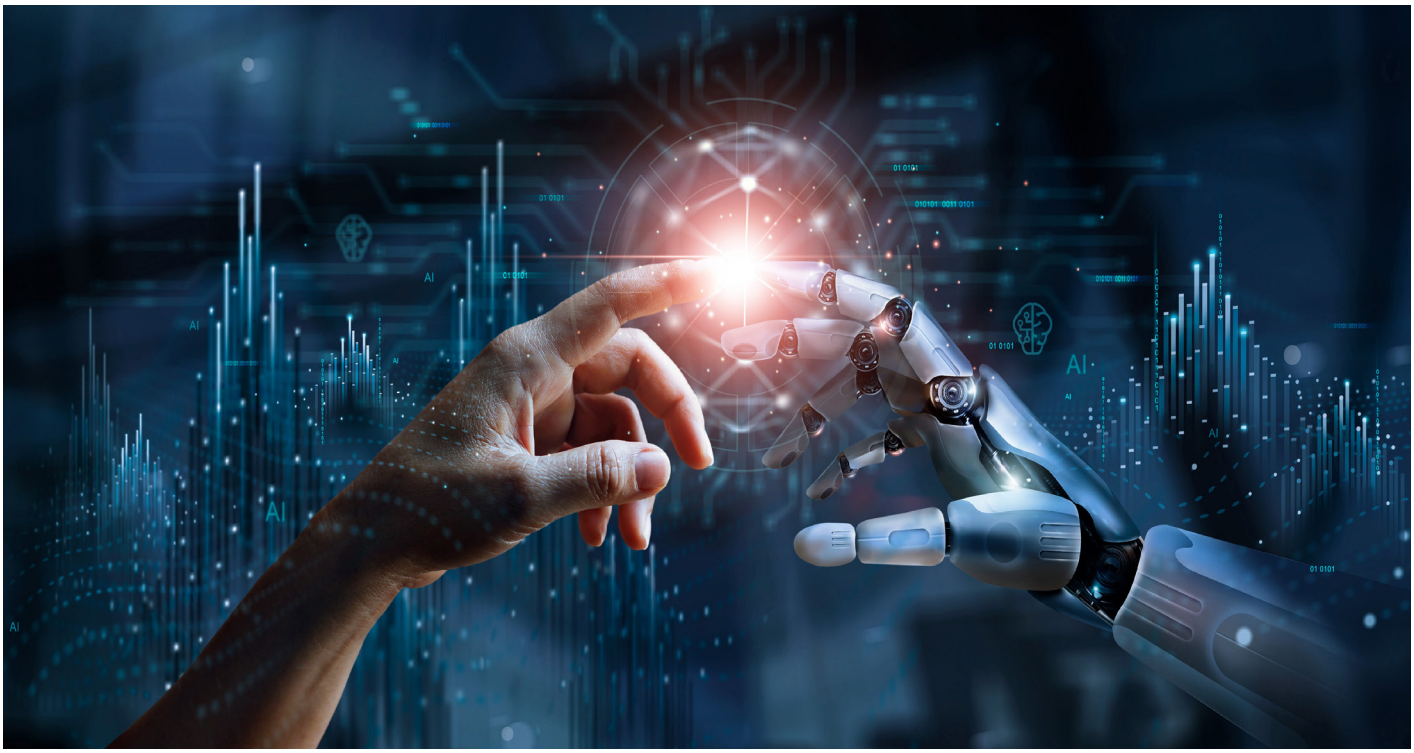
Source: Deloitte Asia Pacific

- **How will GenAI transform the business of this industry?**
  The global content market exceeds US$1 trillion and steady growth is predicted. Market leaders include the United States and China, followed by Japan, the United Kingdom, Germany, France, South Korea and India. The APAC market is experiencing rapid growth, expanding at a faster rate than North America and Europe.[7]

  Deloitte estimates that the global audio entertainment market will grow by 7% overall, with sales exceeding US$75bn in 2024. The market for 3D user-generated content (UGC) is also growing, with platforms expected to pay content developers around US$1.5bn in 2024.[8] The number of paid independent developers on 3D UGC gaming platforms is due to exceed 10 million.[9]

- **What opportunities will GenAI bring to this industry in APAC?**
  Japan outperforms China and South Korea in terms of foreign content revenues from anime and home video games, but lags South Korea in live action, and China and South Korea in PC and smartphone games.[10] While Japan is a leader in home video game content, South Korea dominates music content, and Indian films are also highly rated. GenAI is increasingly being used in the creation of Japanese manga and novels.[11] It can also be used to translate text and vocals into different languages, allowing quick and easy scaling of content globally. The APAC is linguistically diverse and struggles with English content; GenAI is expected to mitigate these issues.

  In the content industry, GenAI offers consumers the potential to become creators. Given the large number of potential individual creators in APAC countries, and their expanding regional and global audiences, the market for GenAI in media and entertainment in the region is promising.



[7] Cabinet Office, Basic Material Related to Cool Japan Strategy," ver1.0, accessed on 2023/12/22: https://www.kantei.go.jp/jp/singi/titeki2/contents_wg/dai3/sankou1.pdf

[8] Deloitte, "Shuffle, subscribe, stream: Consumer audio market is expected to amass listeners in 2024, but revenues could remain modest", 2024/1; https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions.html#shuffle-subscribe-stream-consumer-audio

[9] Deloitte, "Will endless low cost content do to gaming what it did to TV and film?" accessed on 2024/01: https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions.html#media-ent-sports

[10] Ibid, Cabinet Office

[11] The Agency for Cultural Affairs has been collecting case studies on AI and copyright at the "Legal Consultation Desk for Cultural and Art Activities" since February 2024. Accessed from the Agency for Cultural Affairs, accessed on 2024/04: https://www.bunka.go.jp/seisaku/bunka_gyosei/kibankyoka/madoguchi/index.html

5) Telecommunications

GenAI already has proven use cases in the telecommunications industry. A European telecommunications company uses GenAI to enhance customer support, build personalized engagement, minimize wait times, improve customer satisfaction, and increase customer retention rates. This helps to reduce call center operating costs and simplifies pre- and post-call tasks. The company has also introduced a conversational AI-powered virtual agent that uses deep learning algorithms and natural language technologies to provide advanced conversational support. This has significantly improved the speed and quality of customer service. While it has been challenging to provide comprehensive responses to customer queries with traditional chatbots, the use of GenAI is expected to resolve these issues. Virtual voice customer assistants use speech and language recognition to offer tailored advice to customers, provide product recommendations and special offers to enhance customer satisfaction, and create automatic call summaries after customer interactions. GenAI can also be used in operator training, with the potential to enhance customer support quality, reduce costs, and improve response times. The adaptability of the algorithm allows businesses to customize tools to meet the needs of specific departments and corporate requirements.

GenAI has the potential to revolutionize the telecommunications industry by automating repetitive tasks, optimizing network strategies and performance, strengthening customer retention through personalized customer experiences, and improving customer acquisition efforts (Chart 10).

Chart 10: Use cases in the telecommunications industry

Value chain in the telecommunication industry

	Network design	Network infrastructure construction	Network infrastructure construction	Marketing & sales	Customer care
Challenges in the industry within the value chain	• Complex network design leads to inefficiencies or sub-optimal base station configurations and placements	• Construction is costly, time-consuming, and prone to various factors such as terrain and weather • The complexity of networking testing process	• Inefficient maintenance costs and network failures can lead to service interruptions	• Difficult to reach and engage with target customers, and differentiate services	• Difficult in resolving customer claims, returns, and maintenance requests quickly • Investments in chatbots to improve efficiency may not guarantee quality, leading to delays in query resolution
What GenAI can do	• Analyze various factors such as terrain, population density, and usage patterns to optimize network design	• Predict issues in construction processes and automate certain tasks to optimize these	• Predict maintenance needs and network failures, enabling preventive maintenance and rapid problem resolution • Automate the operation process of changing network settings according to the flow of people	• Analyze customer behavior and preferences to create targeted marketing strategies and personalized products • Partially automate the PDCA process in operation	• Automate customer service tasks, analyze customer data to provide personalized services, and efficiently manage opportunities for customer retention, upselling, and cross-selling • Provide comprehensive answers to customer questions
Capabilities and enablers needed for implementation	• Integration of existing networks with AI systems • Data sets such as geographic, demographic, and network usage data for training AI models	• Integration of existing construction systems with AI systems • Professionals with specialized skills	• Integration of existing operation networks with AI systems • Operational data related to maintenance and network failures for training AI models • Long term perspectives that incorporate acceptance of temporary cost increases	• Integration of existing CRM models with AI systems • Data related to customer behavior and preferences for training AI models • AI training for sales and marketing teams	• Integration of existing CRM and customer service systems with AI systems • Q&A and customer data for training AI models

Source: Deloitte Asia Pacific

- **How will GenAI transform the business of this industry?**
  There is a high demand for generative AI in marketing and communications, which are vital functions in the telecommunications field. GenAI also has a key role in the evolution of communication devices. In the consumer market, the number of smartphone shipments is declining. Deloitte estimates that more than 200 million smartphones with satellite connectivity were sold in 2024, with specialized chips worth about US$2bn. Spending on satellite construction and launches could bring total technology investment to enable this market to more than US$3bn in 2024. This need for new devices could lead to market expansion.[12]

  GenAI has extensive and diverse applications in the telecommunications industry, from equipment investment and chips to standalone devices, software and services.

- **What opportunities will GenAI bring to this industry in APAC?**
  In China, Japan, Singapore, and other countries, there is a growing trend towards the development of unique LLMs that cater to each country's language. The APAC region is extremely linguistically and culturally diverse, and customer needs also vary considerably by region and country. As a result, significant business opportunities are associated with the development of LLMs catering to local languages.

  In Japan, not only are individual businesses engaged in development, but there is also a national movement to develop and build LLMs, which are considered a potential "killer app" for post-5G information communication systems.[13]

  The APAC GenAI chatbot market is showing promising growth, following North America and Europe. Several APAC telecommunications operators are introducing GenAI in Australia and South Korea, and this is expected to expand further in the future. The EU's General Data Protection Regulation (GDPR) and other regional regulations have prompted telecommunications firms to exercise caution in using GenAI. While APAC telecommunications operators currently have a more lenient data regulation environment compared to Europe and the United States[14] , they still face the challenge of balancing local language support with global expectations. As APAC data regulations are likely to be strengthened in the future in line with Europe and the United States, it is important that businesses monitor these trends and respond accordingly.

[12] Deloitte, "Signals from space: Direct-to-device satellite phone connectivity boosts coverage," accessed on 2024/01: https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2024/future-of-global-satellite-direct-to-device-communications.html

[13] Ibid, DTFA Institute

[14] Deloitte, "Generative AI: Application and Regulation in Asia Pacific," accessed on 2023/11: https://www2.deloitte.com/jp/en/pages/financial-services/articles/bk/generative-ai-application-and-regulation-in-apac.html

6) Sports

The sports industry value chain involves player scouting and development, team supervision, game logistics, media management, sponsorship, merchandising, and community engagement.

Sports businesses, including teams, clubs and merchandise brands, aim to increase fan and viewer engagement through various activities. These can range from generating social media content and hosting events to building partnerships. Brands aim to have a positive impact on society, improve their brand image, and foster relationships by aligning their initiatives with community values.
The following challenges facing the sports industry are driving demand for GenAI:

- Attracting engagement: With the rise of social media, users have multiple ways to interact with entertainment, accentuating the need for compelling content to ensure a return on investment.
- The rise of globalization: Sports teams and brands must appeal to diverse audiences worldwide while maintaining connections with their core fan base.
- Insufficient stadium connectivity: Fans have become accustomed to constant internet access to share information from games and venues.[15] This creates demand for stadium connectivity with abundant capacity.[16]

GenAI has the potential to revolutionize the telecommunications industry by automating repetitive tasks, optimizing network strategies and performance, strengthening customer retention through personalized customer experiences, and improving customer acquisition efforts (Chart 11).

Chart 11: Use cases in the sports industry

Value chain in the sports industry

	Player scouting & development	Team management	Match operations	Media distribution	Sponsorship acquisition	Merchandising	Community engagement
Challenges in the industry within the value chain	• Hard to predict a player's future performance based on their current form and potential	• Owing to the involvement of many variables, optimizing decision-making for team strategies can be complex	• Managing logistics for matches, which includes predicting large flows of people and traffic, is extremely complicated	• Difficult to reach and engage with viewers as channel numbers increase, and viewer preferences change	• Identify and secure beneficial sponsors and partnerships takes time	• Predict customer demand for different types of merchandise presents issues	• Engage fans in meaningful ways can be difficult due to the diversity of their interests and preferences
What GenAI can do	• Analyze player performance data to predict future performance and identify areas for improvement	• Analyze past games and player performance based on video data to help strategy formulation and decision-making	• Automate specific tasks such as match scheduling and logistics to optimize match operations, including people flow predictions	• Automatically create tailored match digests • Track players with unmanned cameras • Create multilingual subtitles	• Analyze potential sponsors and partners to identify the most beneficial opportunities	• Analyze customer behavior and preferences to predict demand and optimize product offerings • Re-edit and utilize past content	• Generate personalized content • Develop immersive experiences by predicting player movements and actions
Capabilities and enablers needed for implementation	• Integration of existing player management with AI systems • Player performance data for training AI models	• Integration of existing team management with AI systems • Past match and performance data for training AI models	• Integration of existing match operation management with AI systems	• Integration of existing broadcast and equipment controls with AI systems • Viewer data for training AI models	• Integration of existing CRM with AI systems • Data on sponsorships for training AI models	• Integration of existing merchandising with AI systems sales • Performance data for training AI models	• Data on fans and the community for training AI models • Use performance indicators such as SROI to measure efforts

Source: Deloitte Asia Pacific

[15] Global Sustainable Sport, "Sustainability Challenges: Fan Engagement," accessed on 2023/6/1: https://www.globalsustainablesport.com/sustainability-challenges-fan-engagement/

[16] STL, "How Technology Will Drive Greater Fan Engagement In Sports?" accessed on 2022/8/16: https://stl.tech/blog/how-technology-will-drive-greater-fan-engagement-in-sports/

- **How will GenAI transform this industry?**
  The sports market depends on broadcasting rights for games, sponsorship and partnership fees, and merchandise sales on match days. Major markets include soccer, baseball, and basketball.

  GenAI has an extensive range of applications in sports industries and is regarded as a promising future contributor, with strong potential for growth into new sports and the integration of technologies such as virtual reality (VR) and the metaverse.

- **What opportunities will GenAI bring to this industry in the APAC?**
  At the 19th Asian Games held in China in 2023 advanced technologies such as GenAI and the metaverse were used in game viewing, tournament operation, and athlete support.

  While the North American AI sports market is immense, APAC is a promising future market. The region's large population and strong economic growth are expected to drive market expansion in both sports participation and viewing.

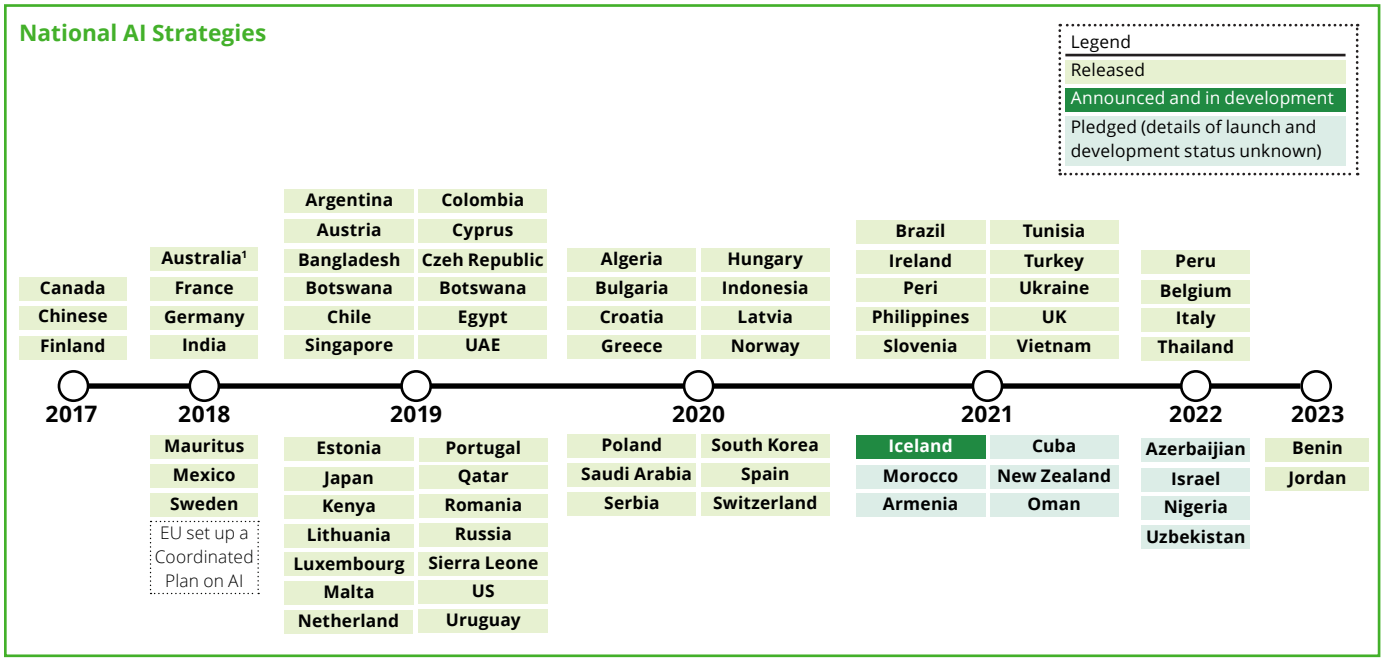
6. Regulations, guidelines, national strategies for AI

Global trends in AI

This overview explores global trends in national strategies related to AI.

Canada was the first country to introduce a national AI strategy in 2017, with over 60 countries subsequently following suit. Most of these were announced after 2019 (Figure 12).

Figure 12: National AI strategies across the world



Note: This report presents only characteristic views of major countries and may not cover them all in depth.

Sources:
- Created by Deloitte Asia Pacific based on publicly available information
- AI Index 2022, HAI Stanford University: https://hai.stanford.edu/ai-index-2022
- OECD, "National AI policies & strategies," accessed on 2024/1: https://oecd.ai/en/dashboards/overview
- Webpages of each country

In December 2023, the European Parliament and the EU's Council of Ministers reached a provisional political agreement on the EU AI Act, expected to become effective during 2026. This Act regulates AI according to its risk, with stricter impositions for higher risks. Specific provisions have been added for GenAI as "general purpose AI (GPAI)". It was agreed that transparency requirements should be imposed on GPAI models and the overall system in which they are incorporated.[17]

In the US: the "Executive Order on the Safe, Secure and Trustworthy Development and Use of AI" was issued in December 2023, considered the country's first legally binding AI-related administrative measure.[18] Regulatory bills specifically relating to GenAI are also being discussed in Congress.

Chart 13: AI-related regulations, national strategies , and provisions for GenAI in western and APAC countries

Country	AI Law enactment	Draft of AI-related legislation	National AI strategy	Provisions on GenAI	Key points
EU	Enacted	Created	Announced (2018)	Enacted	• The EU AI law was approved in March 2023. • It classifies AI by risk level, restricts high-risk cases, and ensures transparency. • GenAI is classified as General Purpose AI (GPAI), and transparency requirements have been imposed.
UK	Not enacted	Not created	Announced (2021)	Points of attention published	• In the government white paper issued in March 2022, establishment of a central support function to supervise AI and coordinate efforts by regulatory authorities within each field was proposed. • The Information Commissioner's Office (ICO) has published points of attention regarding the use of GenAI.
USA	Not enacted	Created (an executive order has been issued)	Announced (2018)	Regulatory bill discussed in Congress	• In October 2023, an executive order (EO) was issued with the aim of formulating new standards for AI safety and security. • Regulatory bills for GenAI are being discussed in Congress.
Australia	Not enacted	Not created	Announced (2020)	Not enacted	• Currently, no specific AI law is in force, and there are no specific provisions regarding GenAI. • The government is exploring the best approach.
India	Not enacted	Created[1]	Announced (2018)	Not enacted	• There is no specific AI law, and a composite AI strategy aimed at balancing innovation and regulation is being pursued.
China	Enacted and created[2]	Created (AI bill under discussion)	Announced (2017)	Enacted (2023)	• Regulations are being enforced on services using GenAI (August 2023). • These must reflect socialist values, eject content that might lead to the overthrow of the state, and prevent discrimination and privacy infringement.
Japan	Not enacted	Created (AI-related basic law under consideration)	Announced (2022)	Progress in related discussions	• While there is no comprehensive AI law, Japan is considering an AI-related basic law along with revisions to various ministerial guidelines affected by GenAI. • As the chair country of the G7 Hiroshima Summit held in May 2023, Japan played a leading role in promoting international rules on AI through the Hiroshima AI Process.

Notes:
1. Limited to specific AI systems (generative AI) at the moment
2. Not a dedicated AI law, expected to be regulated via the proposed Digital India Act

Source: Created by Deloitte Asia Pacific based on publicly available information
- OECD, "National AI policies & strategies," accessed on 2024/4/3: https://oecd.ai/en/dashboards/overview

[17] JETRO, "EU reaches political agreement on comprehensive legislation to regulate AI, including generative AI," accessed on 2023/12/13: https://www.jetro.go.jp/biznews/2023/12/8a6cd52f78d376b1.html
[18] JETRO, "Chinese government enforces regulations on services using generative AI from August 15" , 2023/11/01 https://www.jetro.go.jp/biznews/2023/11/495833ae70119dbf.html

In China: Regulations on services using GenAI have been in force since August 2023. Services that use AI to generate text, images and videos within China must reflect socialist values and must not include content that subverts the power of the state. They must also prevent discrimination and privacy violations.[19]

In the UK: The Information Commissioner's Office (ICO), the country's data protection authority, published noteworthy points regarding the use of GenAI in April 2023. The points were made with the country's General Data Protection Regulation (GDPR) in mind, and clearly state that users bear legal responsibility for the use of personal data.[20]

In Australia: There is currently no specific AI law in force and there are no specific provisions regarding GenAI. However, there are plans to consider regulations on content like deepfakes.[21]

In Japan: There is no law specifically for AI and the country has been exploring a "soft law" approach that prioritizes AI innovation and non- binding principles. However, Japan has played a leading role in promoting international AI regulations, as facilitator of the Hiroshima AI Process and chair of the G7 Hiroshima Summit held in May 2023. In April 2024, Japan published comprehensive "AI Guidelines for Business" to promote safe, ethical and effective use of AI technologies. Japan held in-depth discussions on GenAI at the G7 Hiroshima Summit and the government has launched an internal inquiry into the use of GenAI tools by government ministries and agencies. National agencies have also been established to research areas such as safety and further advance certification systems.

Overall: GenAI is receiving considerable attention, but it is expected that the creation and implementation of national strategies, regulations and guidelines related to GenAI, including parliamentary discussions, collaboration/role-sharing with the private sector, and the use of soft approaches, will progress in future.

General trends in APAC

The emergence of GenAI has compelled policymakers and regulatory authorities across APAC to reassess whether previously introduced AI frameworks are still suitable to mitigate new technological risks. Some regional regulatory authorities have introduced AI initiatives and guidelines on best practice for industries and organizations.

Below is a summary of general trends, but a more detailed overview is available in Deloitte's Generative AI: Application and Regulation in Asia Pacific report.[22] Currently, most regulation focuses on AI in general and there is not yet much content specifically related to GenAI, as follows:

- **AI Principles**
  These provide high-level guidelines to help organizations manage risks associated with AI use across sectors. In China, alongside legislation on AI usage, the National New Generation AI Governance Expert Committee has issued Governance Principles for New Generation AI.
- **Guidance and tools**
  Both are typically used to support the implementation of AI principles. In Singapore, a consortium led by the Monetary Authority of Singapore (MAS) has issued white papers to assist financial services organizations to accelerate effective AI risk management. In May 2022, the Infocomm Media Development Authority (IMDA) and the Personal Data Protection Commission (PDPC) launched A.I. Verify, an AI governance testing framework and toolkit promoting responsible AI use.
- **Laws**
  Many APAC countries have identified AI as a strategic priority and have established national strategies to promote the use of trustworthy AI. These include Japan, China, Malaysia, Thailand and Indonesia. However, despite being a strategic priority, several countries are still in the process of formulating and implementing strategies, and efforts to provide a structured framework to the industry have not yet progressed.

[19] NHK, "Chinese government enforces regulations on services using generative AI from August 15," accessed on 2023/07/13: https://www3.nhk.or.jp/news/html/20230713/k10014128841000.html
[20] Nikkei, "UK authorities publish points to note on the use of generative AI, clearly stating legal responsibility," accessed on 2023/04/04: https://www.nikkei.com/article/DGXZQOGR047ND0U3A400C2000000/
[21] Reuters, "Australia plans AI regulation, including potential ban on deepfakes," accessed on 2023/06/01: https://jp.reuters.com/article/idUSKBN2XN261/
[22] Ibid., Deloitte, " Generative AI: Application and Regulation in Asia Pacific. "

- **National strategies**
  Many APAC countries have identified AI as a strategic priority and have established national strategies to promote the use of trustworthy forms. These include Japan, China, Malaysia, Thailand and Indonesia. Several countries, however, are still in the process of formulating and implementing strategies, and efforts to provide structured industry frameworks have not yet progressed.
- **Initiatives directly related to generative AI**
  Regulators are under pressure to address issues relating to privacy and security, intellectual property rights, and the potential misuse of AI-generated content.

  In China, a law regulating GenAI has been enacted. In Japan, discussions are being held through processes such as the Hiroshima AI Process, and in South Korea, there are plans to introduce AI technology guidelines that include GenAI.

7. The future of GenAI

This final section of the report explores the future impact and potential of GenAI in the TMT industry, the most important factors to consider when implementing it, and challenges that must be overcome.

- **Future of GenAI**
  The following assumptions are generally made in forecasting the future impact of GenAI.
  - Technological developments such as multimodality will progress, achieving fusion between the real and virtual worlds, and leveraging advanced technologies such as robotics. Energy savings will advance, and applications and functions will expand.
  - However, regulations on data security, privacy, and copyright compliance will be tightened, while technological and soft measures will progress, and governance will improve.
  - Some jobs may be replaced or displaced in certain areas, but new employment opportunities will arise.
- **Key considerations**
  Companies must consider the following factors when implementing GenAI.
  - Protecting data and intellectual property is crucial, as is selecting an effective model without compromising data security.
  - Prioritizing user privacy is vital to gain appropriate consent when handling personal data, and establishing robust data protection procedures.
  - Organizations must consider the potential bias of training data, and implement mitigation controls to reduce the possibility of discriminatory outcomes when using GenAI systems.
  - Protection measures to safeguard trade secrets, intellectual property, and customer data are critical.
  - When adopting AI, organizations should develop principles and policies to ensure systems are fair, safe, transparent and adhere to ethical practices. Close industry collaboration and knowledge sharing among technology partners and the wider ecosystem will be key.
  - GenAI adopters should establish a comprehensive strategy to evaluate output accuracy, identify and mitigate risks according to the organization's risk tolerance level and technology.
  - It is essential that humans monitor generative AI-assisted content such as articles, music, artwork and conversations to ensure that these conform to market standards.
- **Challenges**
  Companies in TMT industries should seek paths to use GenAI optimally in various industry scenarios while solving the following challenges in their value chain:
  - Concerns about intellectual property: These arise around the vast amounts of proprietary data used in general-purpose models, and the large investments required to build company-specific infrastructure models.
  - Responding to errors and hallucinations: If GenAI provides inaccurate or fabricated information, decision-making may be compromised. Care must be taken when evaluating system outputs, or businesses could risk problems such as reductions in speed and productivity. It is necessary to evaluate data sources and workflows thoroughly, formulate strategies, and integrate existing development tools with AI.
  - Misinformation risks: If incorrect data is provided by GenAI, organizations face negative consequences in many situations. In the media and entertainment industries, there is fear that the confusion caused by fake news will compromise society. In marketing activities, it poses risks in customer care situations. If data is insufficient, unsatisfactory answers to customers could damage brand perception.

- Limitations in training data: When optimizing LLMs, it is essential to leverage past solutions and simulation and analysis tools for design verification and improvement. If data is limited, gaps between existing GenAI platforms and hardware design could result in errors.
- Securing large resources: Training LLMs consumes vast computing resources, requiring many powerful GPUs and time.
- Privacy concerns: This general issue, related to the implementation of GenAI, is causing concerns among many organizations. Due to proprietary information and privacy issues, it may be difficult to obtain data.
- Legal compliance: Organizations using GenAI must ensure transparency and accountability to meet ethical, diversity and inclusion requirements. They must also undertake security measures, such as licensing and copyright infringement prevention, obtain consent for data use, and add disclaimers to work, etc.
- Mismatch with user preferences: If GenAI creates content that does not align with the image of a brand or player, they risk losing fan engagement. Complex customer problems and emotional issues may also be encountered. Speech synthesizing GenAI may fail to discern the nuances of brand-specific communication in terms of voice and tone.

- **Future of GenAI in APAC**

  The region's expanding population and strong economic growth mean its GenAI market is expected to grow faster than in western markets. APAC has great potential to seize growth opportunities in LLM development and platforms, which have traditionally been weaker in the region.

  The size, growth, and business potential for the use of GenAI in the APAC TMT industry are all very high.

  For APAC businesses to be competitive globally, Deloitte recommends that leaders should incorporate the following three considerations into their GenAI adoption plans:

  1. It is important to decide whether to build GenAI models in-house or continue using general-purpose commercial platforms, and equally, if you should use your own resources or rely on external resources and data. It is possible to blend both approaches, but it is important to have a definitive strategy on how to build a business model and enhance competitiveness and profitability. As GenAI autonomy and versatility increase, business leaders will face important decisions around building internal capabilities and talent, as well as effective ecosystems in and outside the company.

  2. GenAI is developing at exceptional speed, with big tech driving technological innovation and utilization. As regulations and guidelines catch up, businesses will need to consider their responses to guidance and adopt agile governance practices. This not only includes technical considerations, but also corporate governance issues from a managerial perspective, such as unexpected scandals and misconduct. It is worth nothing that GenAI can prevent the occurrence and recurrence of scandals and misconduct and can be considered as a useful tool in compliance and risk management plans.

  3. Rapid progress in the GenAI hardware domain is unfolding globally, particularly in the semiconductor industry, as countries push to onshore development and manufacturing. The expansion of data centers, supportive policy instruments such as subsidies, and the push for supply chain security are driving momentum across the world, including in the US, Europe, Japan and China. Countries and organizations must carefully consider these developments as they strategise around collaboration with the evolving ecosystem. Other challenges, such as improving energy efficiency and renewable energy usage in the semiconductor and data centre industries will also need to be addressed. APAC organizations which manage this effectively could gain a competitive advantage.

GenAI is a very powerful technology and APAC leaders must act fast to plan, build, implement and operationalize solutions to remain competitive. At Deloitte, we are committed to supporting business leaders in navigating the transformative impact of this disruptive technology and building effective strategies to harness its full potential.

We hope you find this report useful and look forward to your feedback.

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