Case Study 01 Initiatives at NTT DATA to Achieve Business Innovations Using Generative AI

NTT DATA is transforming our customers' businesses through the use of Generative AI. The explosive AI trend that NTT DATA Technology Foresight has been following for six years became Generative AI, an innovative technology that has captured the attention of business, while the use of Generative AI has spread across a variety of areas including business writing, assisting experts, customer service, and software development. On the other hand, given the fact that the data generated through Generative AI bears the unique characteristic of having been created by AI, issues such as the copyright or authenticity of the generated data have surfaced to spark societal debates.

At present, NTT DATA has established the "Global Generative AI Office" to move forward Generative AI business along two different axes: utilizing Generative AI at the global level and addressing AI governance. We are using Generative AI to support internal activities such as software development and knowledge sharing at NTT DATA in order to improve our own productivity and are also working to provide our customers with solutions and new business use cases involving the use of Generative AI. By preparing guidelines to minimize the various risks associated with Generative AI and expanding them around the world, we

have also prepared a system that allows us to provide our customers solutions safely and with peace of mind. Furthermore, using **tsuzumi**," the Generative AI solution by NTT, we are working on research and development to provide Generative AIs specific to industries and individual companies.

Going forward, NTT DATA will continue to maximize combinations of our global solutions and data center capabilities with Generative AI further optimizing our business operations, supporting the innovation and growth of our customers' businesses, and pursuing engagements meant to facilitate the next stages of evolution in AI.

Case Study 02 Digital Twins Open New Business Horizons

In recent years, advances in sensor technology and 3D modeling technology have led to the business use of digital twins. The use of digital twin technology is expected to improve the efficiency and flexibility of development and manufacturing processes, and will accelerate innovation, especially in the manufacturing, medical, and construction industries. NTT DATA verifies and evaluates digital twin-related technologies and conducts co-creation R&D with advanced customers based on these results. Using our accumulated know-how and knowledge, we also support the implementation of digital twin systems that meet the needs and applications of our customers.

As a specific example, NTT DATA worked with NVIDIA and FANUC Deutschland GmbH to create a digital twin of a manufacturing site, including a FANUC robot arm. By using private 5G, information such as the orientation and color of objects acquired from the camera was immediately reflected on the digital twin side, and the simulation results

within the digital twin were verified by reproducing them with a real robot arm. Taking advantage of the digital twin, we are also working on conducting tests in scenarios that would be difficult to achieve in the real world and obtaining training data for AI models for automated control.

Through these activities, we are to co-create value with our clients in Japan and abroad.

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A Compass for the Present and Future of IT and Business

NTT DATA Technology Foresight serves as a compass that provides a trend-setting guide to where businesses are headed based on extensive and objective information gathering and an examination of the current conditions of businesses that continue to grow by maximizing their use of IT. The "Introduction" section reconfirms the concepts behind basic trends and the relationship between business, society, and IT, while the "Technology Trends" section details the direction in which IT is evolving and provides insight into future corporate strategies. We hope that this report, which is directly related to our technology strategy, will be of help to those of you who are using IT to meet the many challenges of a rapidly changing and increasingly complex world.

INTRODUCTION

1 Organizing IT by trends

Trends in technology, directionally identified from vast amounts of information, foreshadow new business strategies. An unbiased, broad, and in-depth look at technology and case studies will provide a picture of the present and future, and provoke more concrete discussions about the next steps.
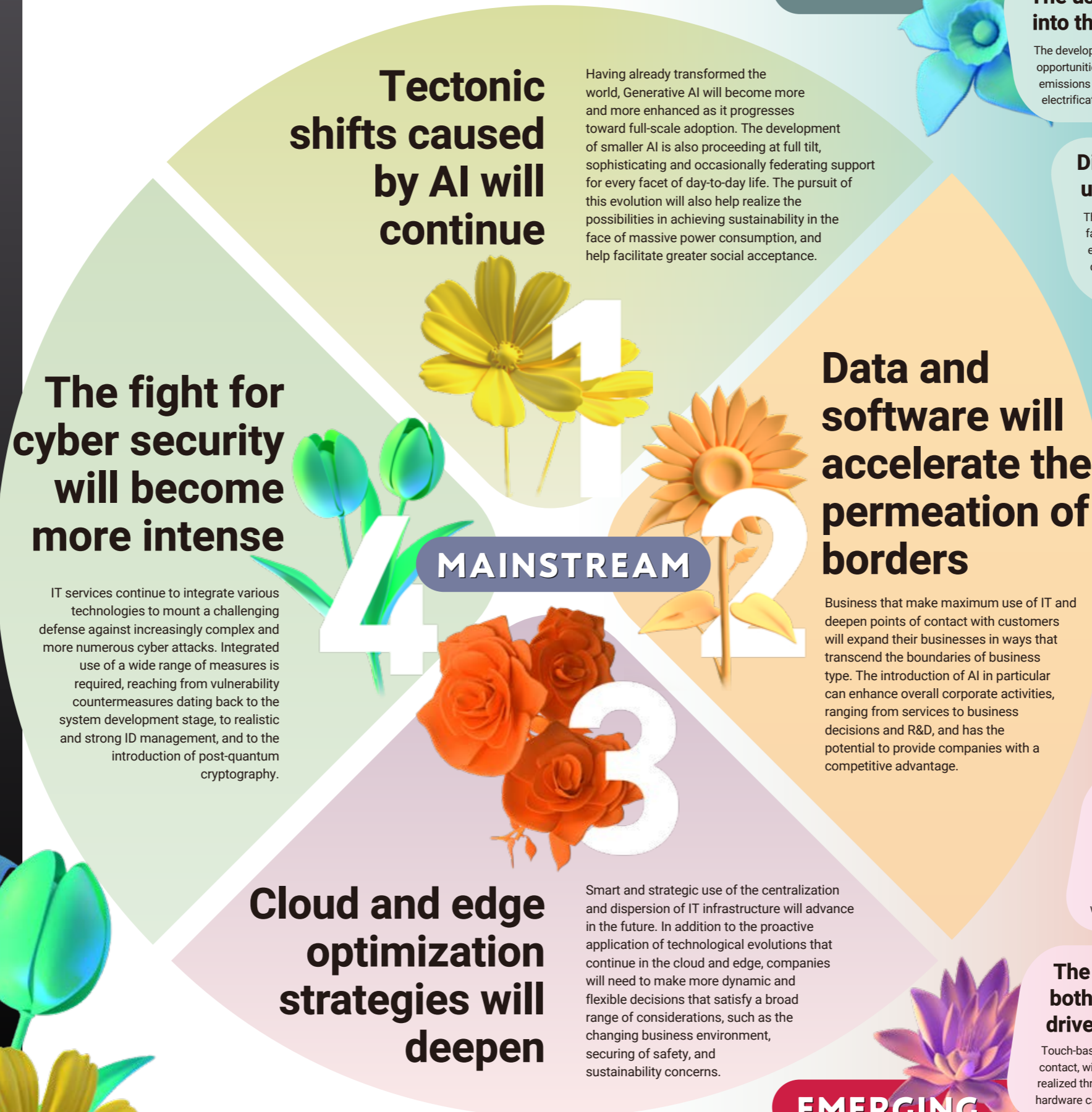
2 Business is being changed by IT

Superior use of technology is directly related to business. Strategies that reap a wide range of benefits, including the acquisition of a global market, securing both vast numbers of users and personalized interactions, and directing them to the most appropriate segmented services, begin with an early understanding and initiation of ever-evolving technologies.

3 Society is being transformed by IT

The rapid diffusion of technology brings with it a variety of social challenges. Various short-term measures are being taken to avoid these challenges and ensure smooth diffusion. Discussions aimed at fostering norms that will provide direction for the medium and long terms are inevitable and require active participation by those who command technology.

TECHNOLOGY TRENDS

MAINSTREAM

1 Tectonic shifts caused by AI will continue

Having already transformed the world, Generative AI will become more and more enhanced as it progresses toward full-scale adoption. The development of smaller AI is also proceeding at full tilt, sophisticating and occasionally federating support for every facet of day-to-day life. The pursuit of this evolution will also help realize the possibilities in achieving sustainability in the face of massive power consumption, and help facilitate greater social acceptance.

2 Data and software will accelerate the permeation of borders

Business that make maximum use of IT and deepen points of contact with customers will expand their businesses in ways that transcend the boundaries of business type. The introduction of AI in particular can enhance overall corporate activities, ranging from services to business decisions and R&D, and has the potential to provide companies with a competitive advantage.

3 Cloud and edge optimization strategies will deepen

Smart and strategic use of the centralization and dispersion of IT infrastructure will advance in the future. In addition to the proactive application of technological evolutions that continue in the cloud and edge, companies will need to make more dynamic and flexible decisions that satisfy a broad range of considerations, such as the changing business environment, securing of safety, and sustainability concerns.

4 The fight for cyber security will become more intense

IT services continue to integrate various technologies to mount a challenging defense against increasingly complex and more numerous cyber attacks. Integrated use of a wide range of measures is required, reaching from vulnerability countermeasures dating back to the system development stage, to realistic and strong ID management, and to the introduction of post-quantum cryptography.

GROWTH

1 The use of green tech will be incorporated into the foundations of corporate activities

The development of various technologies to reduce carbon emissions will create business opportunities in addition to meeting new obligations. This development will also help quantify emissions of business activities, accelerate a shift in energy policies centered around electrification, and evoke the development of innovative technologies.

2 Digital twins will lead the way toward the utilization of IT in the physical world

The development of technology to replicate physical spaces using IT is a challenge facing efforts to make digital competitiveness a reality in the real world. This experimental technology will not only improve the efficiency of machine and building design, but will also lead to the rapid elucidation of the fundamental principles of atoms and cells, resulting in an overwhelming increase in productivity.

3 Competition for computing power will increase

In order to seize the initiative in forthcoming IT generations, leading companies will continue to participate in the development of their own dedicated chips that will involve massive investments. The fact that the development of Generative AI continues to rely on semiconductors and software from specific vendors underscores the value that establishing proprietary technology brings and continues to promote exploratory endeavors.

EMERGING

1 Space utilization will open up new markets

Space development links together everything from the digitalization of the entire Earth through high-density satellite networks, to advancement into unexplored reaches of space. Business that utilizes space data, which has been materialized through the initiative of the private sector, is intensifying competition to create a new market for space stations and even explorations into deep space.

2 Automation of robotics will continue steady adoption

As a means of supplementing labor, robotics is expanding its domain of application into everyday life. Robots, which are being used in everything from work in harsh environments to household labor, will become easier to introduce into workplaces thanks to AI, and thus facilitate collaborative labor between people and robots. This will help usher in an age where machines learn to do their work on their own.

3 The pursuit of user experiences that realize both physical and personal attributes will drive competition

Touch-based user experiences, which seek to realize the satisfaction that comes from physical contact, will serve as the crux of future differentiation strategies. Points of contact with customers realized through integrated design addressing physical sensations in addition to software and hardware can avoid commoditization, and realize differentiation in the edge computing domain.