Fujitsu Technology and Service Vision 2023

Executive summary | English edition

Driving Sustainability Transformation through Digital Innovation

Fujitsu Technology and Service Vision (FT&SV) is an evolving story, exploring the future we'd like to create with our customers and partners, how technology can help us achieve this vision and the specific actions needed to make it happen.

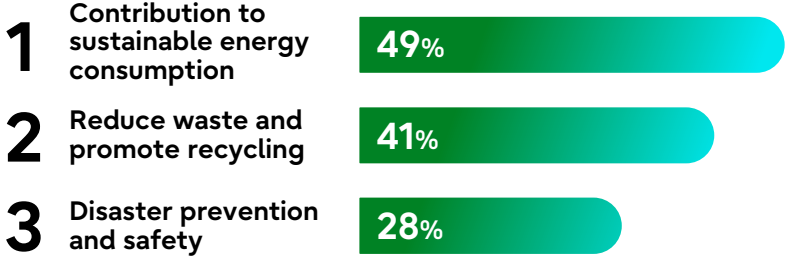
Last year, we introduced "Driving Sustainability Transformation through Digital Innovation" as the most important theme for the next 10 years. Sustainability transformation means transforming business to bring about positive change in our environment, society and economies.

In FT&SV, we describe the different futures that the evolution of technologies will drive, outlining how Fujitsu can help organizations to transform and pursue a collaborative journey towards a regenerative society.

Sustainability brings business opportunities

Climate change and geopolitical tensions continue to have a major impact on society, business and people's lives. According to Fujitsu's survey* of 1,800 business leaders in 9 countries in January 2023, 53% of business leaders believe these external factors are now having a significant impact on their business. At the same time, business leaders view these sustainability challenges as new business opportunities. They see these opportunities primarily in sustainable energy consumption, followed by waste reduction, recycling, disaster prevention and safety.

Number of samples: 1,769
(excluding public sector)



* Fujitsu's commissioned survey conducted by Oxford Economics among CxOs and decision makers in Australia, China, Japan, France, Singapore, Germany, Spain, United Kingdom, United States (an online survey with partial interviews).

How can value be created from sustainability?

To create business opportunities from sustainability, organizations need to set a purpose oriented for the benefit of environment and society. In parallel, they need to transform their business into one that provides value to the environment and society.

By transforming their business in line with their purpose, organizations will gain the empathy of their customers, in turn increasing preference for their brands and products. As employee empathy also increases, organizations will increase employee engagement and productivity. In this way, providing value to customers and employees leads to increased business value. This is the value creation cycle based on the “Sustainability = Business” model.

Value creation cycle of Sustainability = Business model

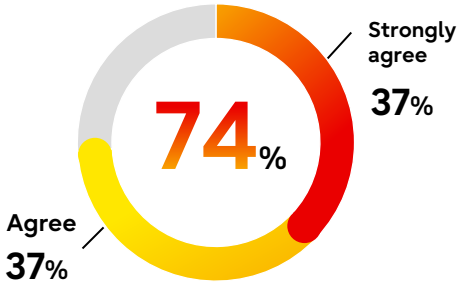
Digital is key for successful sustainability transformation

The new technology platforms and organizational capabilities that organizations have built through their digital journeys are extremely effective for generating sustainability outcomes.

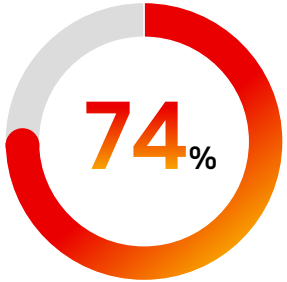
In the Fujitsu survey, 74% of sustainability leaders indicated that digital transformation is key to promoting sustainability transformation. Similarly, 74% of sustainability leaders are also digital transformation leaders.

Number of samples: 152

Digital transformation helps organizations to succeed in sustainability transformation



The ratio of digital leaders in sustainability leaders



1 | Automation

Amplifying creativity

2 | Experience

Being connected and inclusive

3 | Innovation

Developing at quantum speed

4 | Resilience

Redesigning the future

5 | Trust

Evolving Web

Digital-led sustainability

How can we leverage digital technology to create sustainable value for the environment, well-being and economies? We believe it is necessary to pursue digital excellence across these five key dimensions of digital-led sustainability.

In FT&SV, we explore the technology megatrends impacting these five key dimensions, as well as leading-edge Fujitsu technologies that will help us realize our technology vision.

Automation

Amplifying creativity

AI technologies have already automated various routine tasks to improve efficiency. Very large-scale generative AI models, such as GPT4, can now automate creative work as well.

We can improve both efficiency and creativity through our collaboration with AI. The evolution of AI technologies will dramatically change the way we work across many domains.

1

Future scenario

Community Health with AI

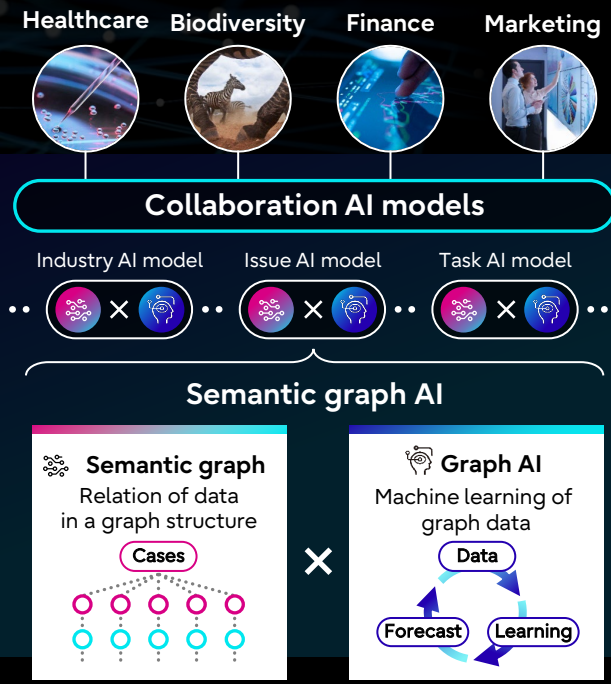
Kumiko, a doctor in her 70s in a small town in Japan, offers effective treatment by collaborating with a medical AI system. By analyzing vast data resources, the AI can suggest treatment plan options by inferring the causal relationships between genomic information and medication. With the help of AI, Kumiko can achieve her goal of improving regional healthcare.

Technology breakthrough

Semantic graph AI

A transparent knowledge base is essential to enable people and AI to work together effectively. Technology is now being developed to enable autonomous inference of causal relationships between vast amounts of data. This enables the discovery of new knowledge, by using AI to analyze data relationships and create graph-structured data (referred to as 'semantic graphs'). This graph-structured data is already progressing to a practical stage in genomic medicine. In the future, we will see the development of semantic graph AIs focusing on environmental, social, industrial and business issues.

People and AI working together



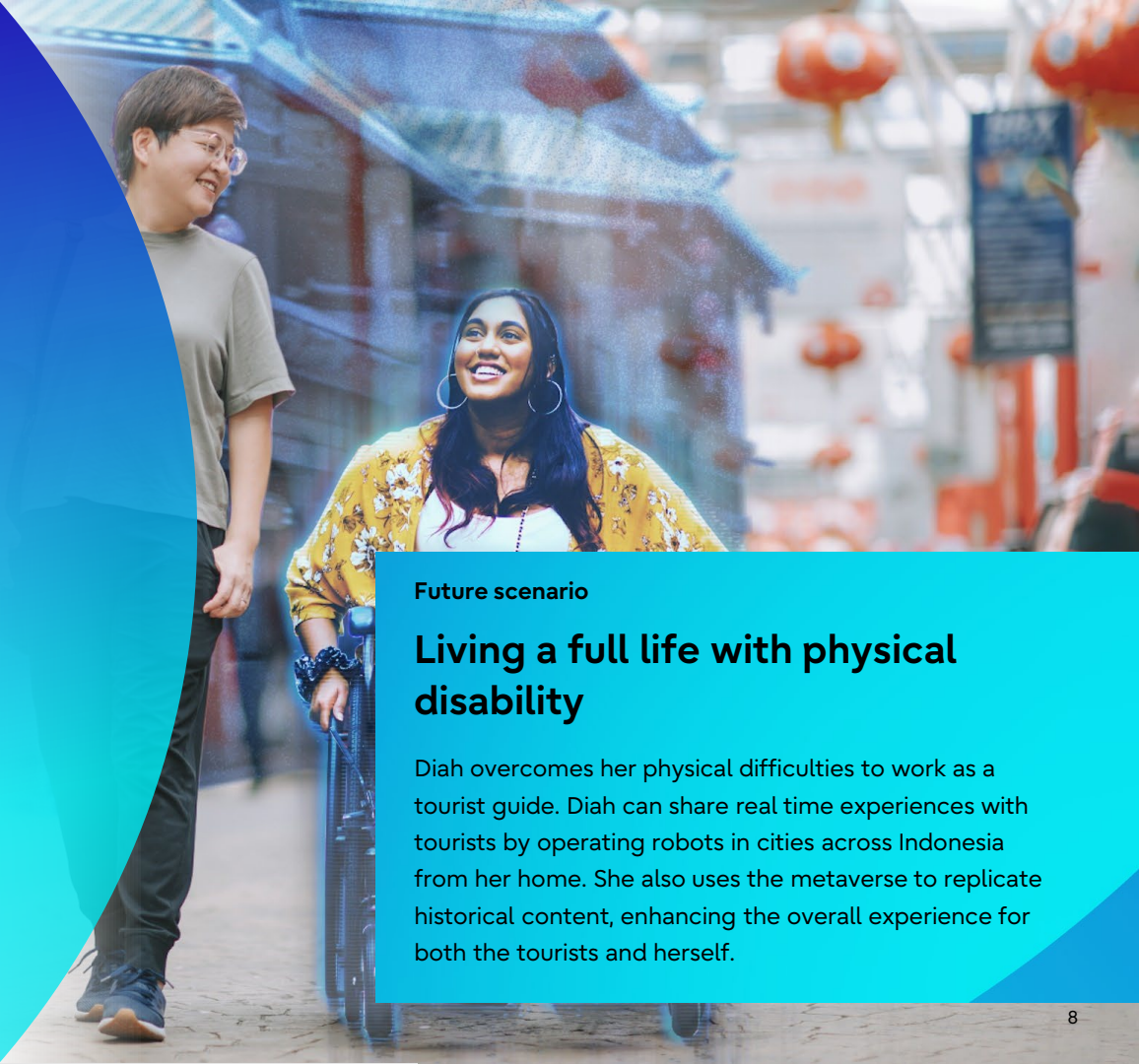
Experience

Being connected and inclusive

Human rights and employment opportunities can be restricted by physical considerations like a person's living environment. How can technology help solve this challenge?

We believe that a converged physical and digital world can help people to maximize their potential, overcoming physical constraints and enabling more inclusive experiences.

2



Future scenario

Living a full life with physical disability

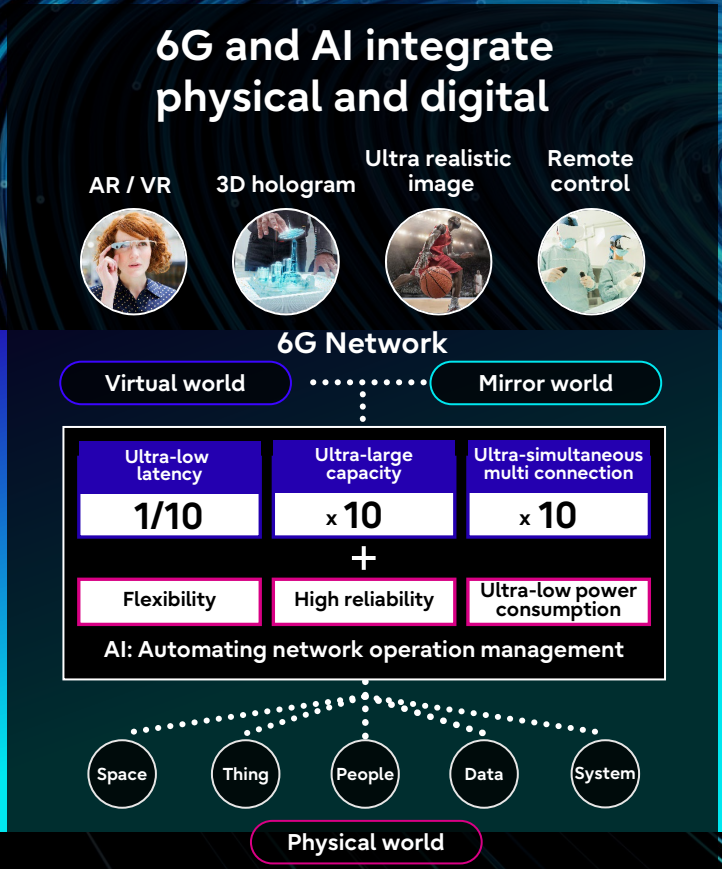
Diah overcomes her physical difficulties to work as a tourist guide. Diah can share real time experiences with tourists by operating robots in cities across Indonesia from her home. She also uses the metaverse to replicate historical content, enhancing the overall experience for both the tourists and herself.

Technology breakthrough

Intelligent networks

How are we enabling Diah's experiences? A converged physical and digital world is realized by creating and overlaying high-resolution images in the physical world with VR/AR. The key is the network technology.

By introducing network technology that transmits large amounts of data in real time and AI technology that enables high-quality network connections with ultra-low power consumption, we can realize a world where everyone is connected and no one is left behind.



Innovation

Developing at quantum speed

We need to accelerate innovation in order to overcome the systemic challenges we face. Ultra-high-speed digital simulation, coupled with the power of AI models, will enable us to complete the entire innovation process in the digital world. This radically different approach has the potential to shorten innovation lead times from years to months.

3

Future scenario

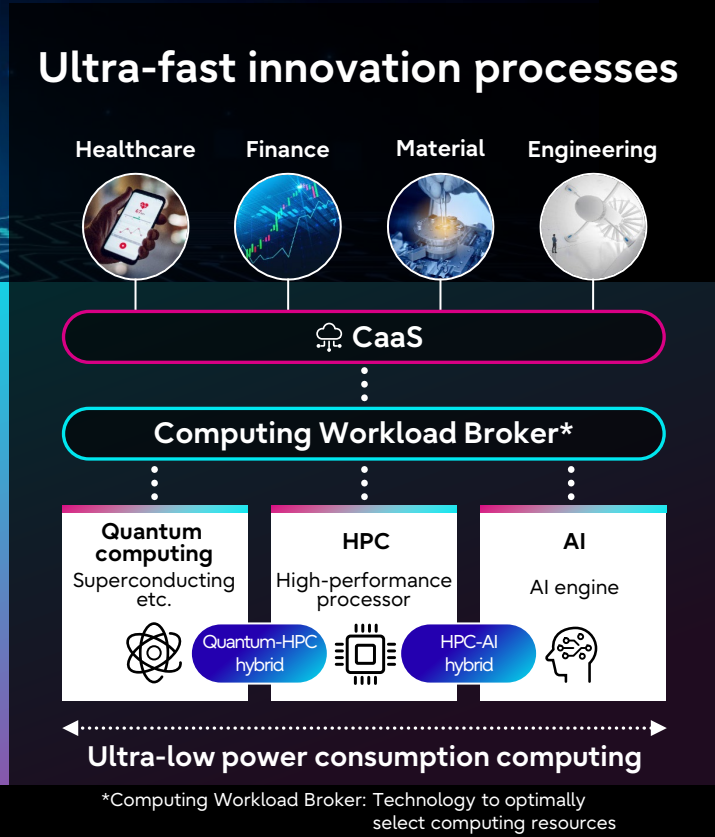
Digitally-led energy innovation

Ayman works in the development of hydrogen energy. He can now conduct the entire innovation cycle in a metaverse lab, from searching for new catalysts to designing new equipment and facilities. Transportation, power and mobility organizations can also collaborate to optimize the hydrogen supply chain, helping to significantly shorten the overall time to market.

Technology breakthrough

Integrating Computing and AI

Conducting the entire innovation process through digital simulation, as described in Ayman's future story, will require significantly greater computing power. To increase the power of computing, AI models can be symbiotically integrated into high-speed simulation. We expect to see the development of hybrid quantum and HPC computing models, complementing each other's strengths. These super-technologies will be provided via Computing as a Service (CaaS) through the cloud, helping to shape open innovation ecosystems.



*Computing Workload Broker: Technology to optimally select computing resources

Resilience

Redesigning the future

How can we be more proactive in responding to unexpected challenges? We can be better prepared by rehearsing possible future scenarios using digital twins. The key lies in developing federated digital twins that can exploit data from multiple organizations and sectors, such as mobility, energy, healthcare and the environment.

4

Future scenario

Resilient cities using digital twins

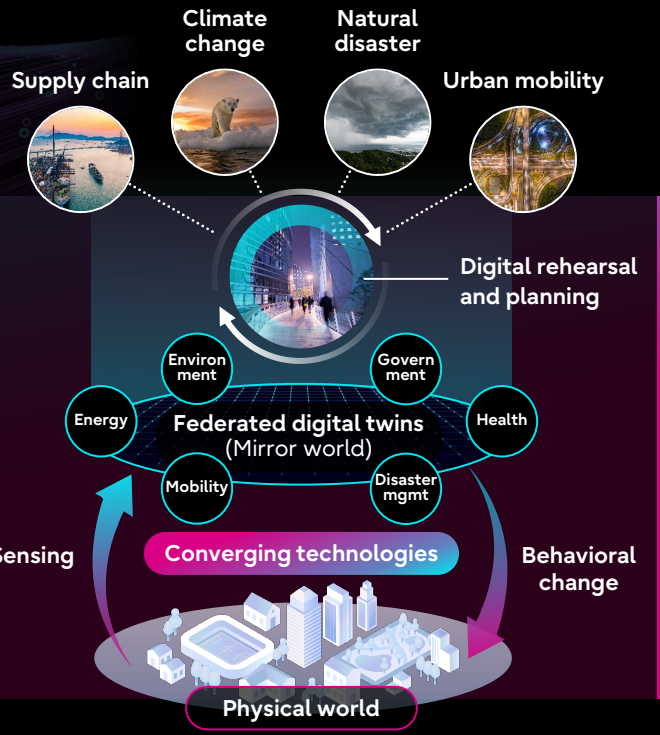
Nicolas is the mayor of a major city in Brazil. He is creating a federated digital twin to help citizens and tourists find the most efficient, eco-friendly means of transportation, minimizing environmental impact. The city can also prepare prompt evacuation guidance and plan the delivery of relief supplies based on real time data in case of an emergency situation.

Technology breakthrough

Federated Digital Twins

Two breakthroughs are required to help us address our systemic challenges. Firstly, we need to integrate human behaviors into simulation models, combining digital with human-centric insights cultivated by the humanities and social sciences. We call this ‘converging technologies’. Secondly, we need to connect multiple digital twins to run detailed simulation of complex, real-world problems. This will enable more harmonious approaches to resolving complex issues, issues that would previously have involved conflicting trade-offs between the environment, well-being and economies.

Helping to solve complex challenges



Trust

Evolving Web

We're in a zero-trust world where nothing can be trusted. How can we build trust as people, data, things and processes become connected across the borderless world? The evolution of Web3 will be key to creating autonomous, distributed trust, ensuring trust across everything that's connected.

5

Future scenario

A member of a regenerative society

In addition to their original jobs, all are members of a DAO*, which promotes foods with high environmental and social values. They receive tokens according to their contribution in promoting sustainable foods. These grass-roots activities are spreading through networks, leading to a regenerative society.

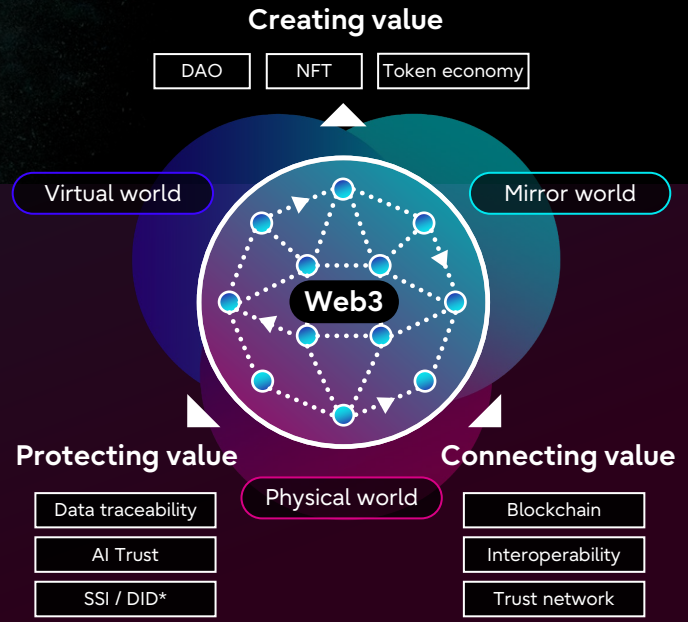
***DAO (Decentralized Autonomous Organization)**
A form of blockchain-based organization characterized by the autonomy of each member without the need for a centralized administrator.

Technology breakthrough

Trusted value chains

In our future scenario, we have looked at a new economic model in which environmental and social values will circulate globally. This new economy will be enabled by Web3, built on a set of distributed trust technologies like blockchain. In the borderless world, distributed trust technologies will allow people and organizations to develop trusted value chains by creating, connecting and protecting new value.

The foundations of a regenerative society



*SSI(Self-Sovereign Identity) : Concept of allowing individuals to own and manage their identities

DID(Decentralized IDentifier) : Identifiers used to implement distributed identity management

Fujitsu's key technologies

Fujitsu is focused on the following five technology areas, working together with a range of partners. Among these, AI is advancing rapidly, with wide applications and increasing importance.

We are now integrating computing, network, data and security and converging technologies with AI technology to drive our vision.

5 technology megatrends

Amplifying creativity	Being connected, inclusive	Developing at quantum speed	Redesigning the future	Evolving Web
AI • Semantic graph AI	Network × AI • Intelligent networks (AI controlled network)	Computing × AI • HPC • Quantum computer	Converging Tech. × AI • Federated digital twin	Data & Security × AI • Web3/Blockchain • Trust network

Fujitsu's key technologies

Computing | Network | AI | Data & Security | Converging Technologies

Fujitsu
Uvance

Fujitsu is driving Sustainability Transformation

In 2021, we launched a business model, Fujitsu Uvance, focused on driving sustainability by solving cross-industry environmental and social challenges. Fujitsu Uvance harnesses our advanced technologies, skills and industrial knowledge to accelerate sustainability transformation for our customers.

In 2022, we introduced exciting new services, including those contributing to carbon neutrality.

Solving environmental problems

Improving people's well-being

Developing a digital society

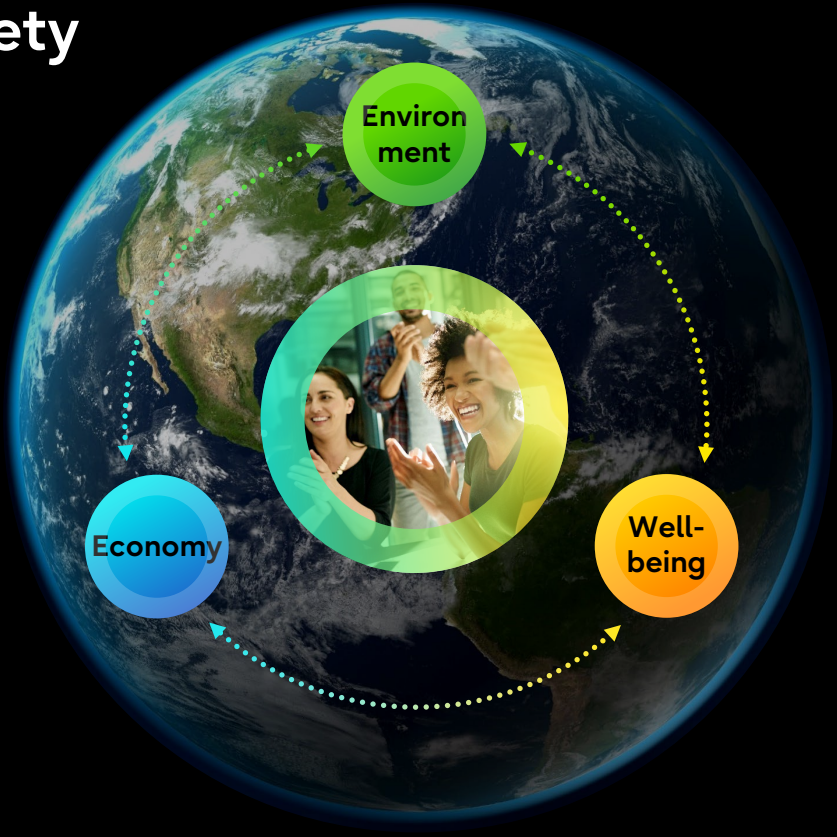
Our journey to a regenerative society

Our goal is to create a sustainable society in which the environment, people and the economy are interconnected within the boundaries of our planet.

The first step is to identify issues that organizations need to address, and to integrate sustainability into business.

In order to scale this undertaking, organizations, governments, research institutes and communities need to share a common purpose, build cross-industry connected ecosystems, and co-create innovations that deliver environmental and social value.

Fujitsu is committed to working with you on this transformation journey, building a better future together.



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May, 2023

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