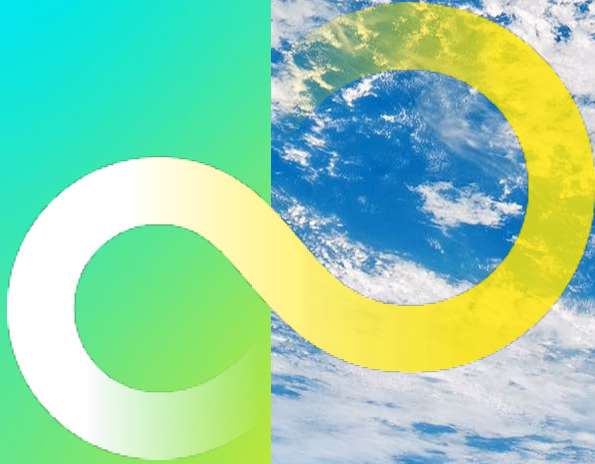


# Fujitsu Technology and Service Vision 2022



English edition





# Our purpose

Make the world more sustainable by building trust in society through innovation.



In 2020, Fujitsu set out our purpose, focused on making a positive contribution to global sustainability. Clearly, the task ahead is enormous. What are the main challenges we face? How can emerging technologies empower people to generate innovation and improve sustainability across both business and society?

In this Fujitsu Technology and Service Vision 2022, we share our views on this important topic, exploring how we can work together with you to achieve a more sustainable future.



## Message from the CEO

More than two years have passed since COVID-19 began to spread around the world. Now, alongside the pandemic, increasing geopolitical risks are making it even more difficult to foresee the future. The world has become more connected, with greater complexity than ever before. A problem in one region may impact people's lives around the world, while significant systemic challenges continue to threaten the sustainability of both business and society.

Today, everyone and every organization must embrace environmental, social and economic sustainability as their own issue and take the concrete actions required. In 2020, Fujitsu set out our purpose, to make the world more sustainable by building trust in society through innovation. We are now working with our 130,000 people around the world to encourage a new mindset and create positive actions. In 2021, we announced Fujitsu Uvance, a new business brand that reflects our commitment to a more sustainable world.

Digital technology can provide the platform to help organizations transform their business and deliver more sustainable value. This tenth anniversary edition of the Fujitsu Technology and Service Vision explores how digital technology can help to drive sustainability transformation. We hope this provides useful insights to support your own transformation journey.

CEO, CDXO  
Fujitsu Limited  
May 2022



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## Transformation of Business and Society

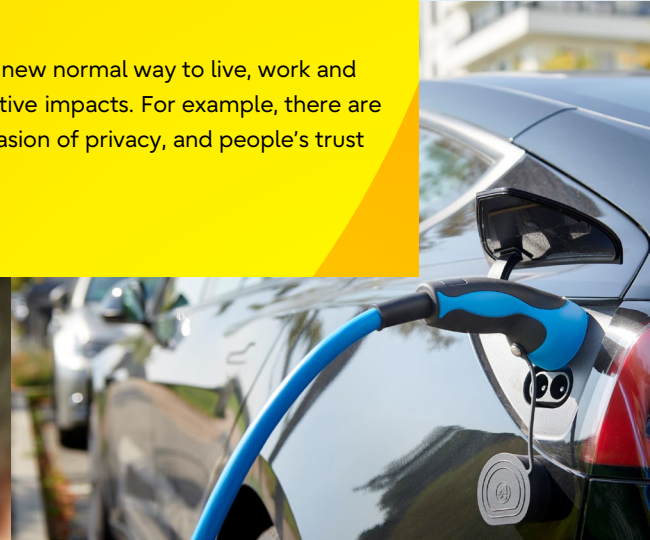
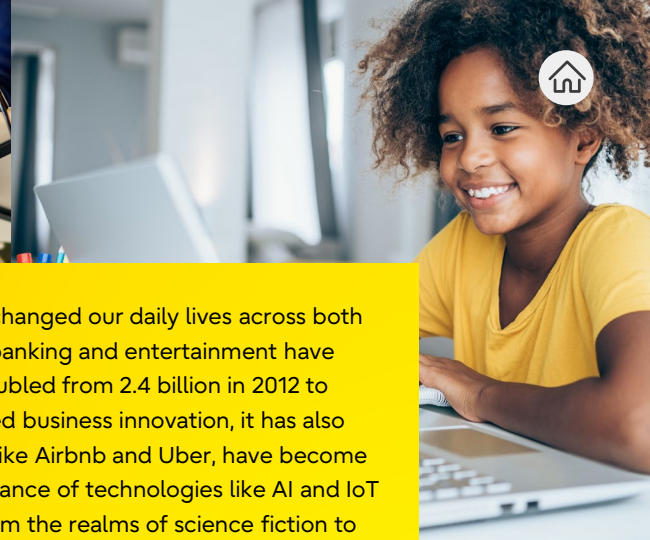
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# The past 10 years

Over the last 10 years, digital technology has significantly changed our daily lives across both business and society. Online social networking, shopping, banking and entertainment have expanded rapidly, as the global internet population has doubled from 2.4 billion in 2012 to nearly 5 billion today. While digital technology has delivered business innovation, it has also disrupted existing industries. Entirely new digital services, like Airbnb and Uber, have become widely popular around the world. Meanwhile, the rapid advance of technologies like AI and IoT has enabled concepts such as self-driving cars to move from the realms of science fiction to reality.

In light of the COVID-19 pandemic, digital has become the new normal way to live, work and learn. But, of course, digital technology can also have negative impacts. For example, there are growing concerns about the proliferation of fake news, invasion of privacy, and people's trust in AI and other emerging technologies.

It is now time to rebuild trust in society.





# Fujitsu Technology and Service Vision

The Fujitsu Technology and Service Vision (FT&SV) has been delivering our foresight for business and society for the past 10 years. FT&SV is an evolving story, describing the future we want to create together with our customers and partners, the ways that technology can empower people to drive this vision, and the actions we need to take now.

For Fujitsu people, this provides an important compass for our future direction. We have updated FT&SV every year since its launch in 2013, reflecting the potential of emerging technologies and the impact of dynamic socio-economic trends.



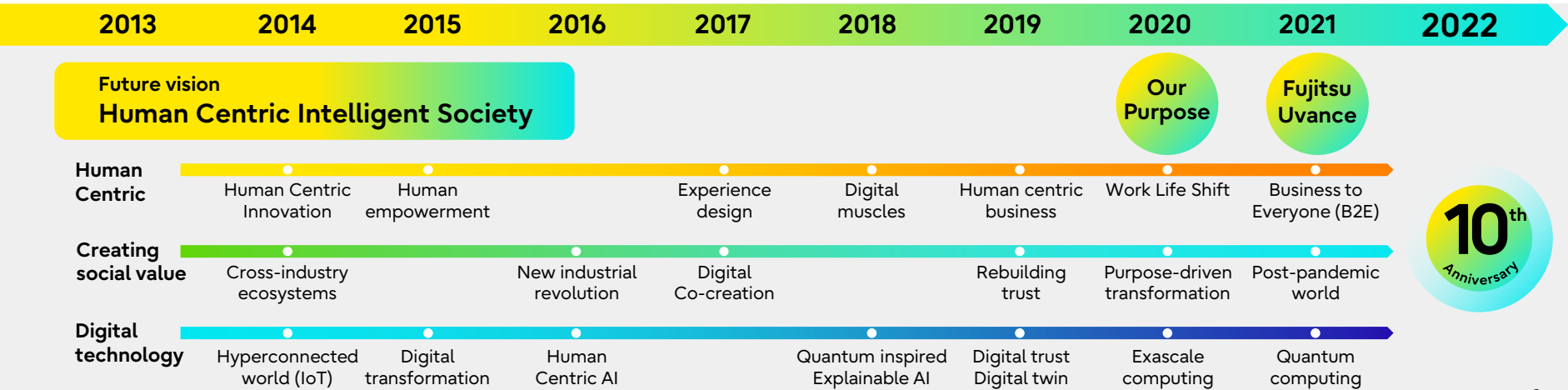


# FT&SV's 10 years

Through FT&SV, we have consistently shared our foresights into driving Human Centric Innovation and shaping ecosystems to create social value. We have explored how the advance of digital technologies can help achieve our future vision of a Human Centric Intelligent Society. Many previous FT&SV themes, such as human-centric digital transformation and rebuilding trust are now firmly established as critical items on today's management agenda. In parallel, Fujitsu continues our own transformation, co-creating social value with customers and partners. We are now accelerating this momentum with Fujitsu Uvance.

To deliver trusted value for business and society, Fujitsu has successfully delivered technology breakthroughs, from explainable AI and quantum inspired computing through to the world-fastest supercomputer and the ultra-large-scale real-time digital twin.

2022 marks the tenth anniversary of FT&SV. The world is at a crossroads. How will the future unfold? What are the key themes that will shape and define the next 10 years?

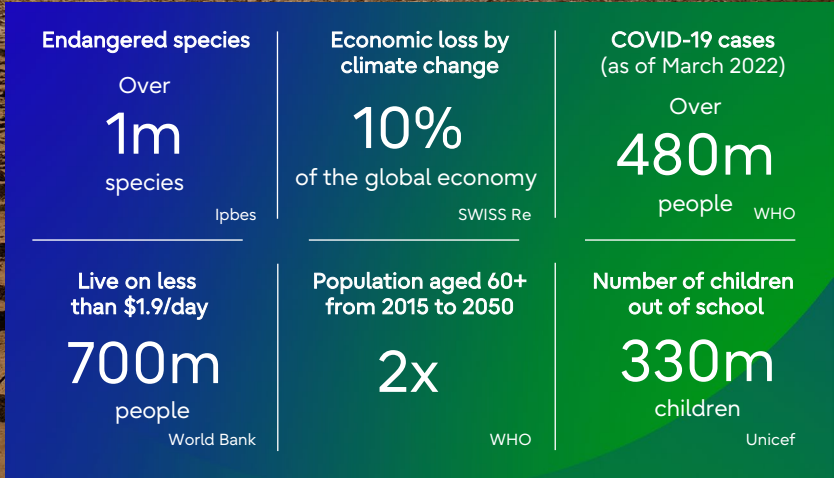


# Crisis of global sustainability

We face a global environmental, social and economic crisis. Climate change poses an existential threat, both to humanity and many other species. Global warming has continued over the past 10 years, causing glacial retreat, destruction of coral reefs and extreme weather conditions. This has impacted biodiversity, with more than 1 million species now endangered.

In addition, we face significant social challenges such as poverty, human rights violations, limited access to healthcare and education and an aging population. Moreover, we are faced with unprecedented uncertainty, brought about by the pandemic and geopolitical issues.

What actions should we take to overcome these critical challenges?







# The next 10 years

## Driving sustainability transformation through digital innovation

The mindset of global business and political leaders is changing rapidly. Environmental, social and economic sustainability is now a global imperative. There is a growing acceptance that all organizations need to conduct their economic activities within our planetary boundaries. Digital technology has the exciting potential to enable the innovation required to address our most complex and difficult challenges.

The headline theme for the next 10 years is to drive sustainability transformation through digital innovation. Sustainability transformation means transforming business to bring about positive change in our environment, society and economies.

To make this vision a reality, organizations need to change the mindset of their people. They need to transform their business processes and value propositions.

Fujitsu is your sustainability transformation partner. We are focused on enabling you to transform your business for a more sustainable future. To achieve this, we are delivering digital innovation that creates business resilience against uncertainty, while enhancing environmental and social value.

The next 10 years

Sustainability  
Transformation

Digital  
Transformation



# FT&SV 2022 big picture

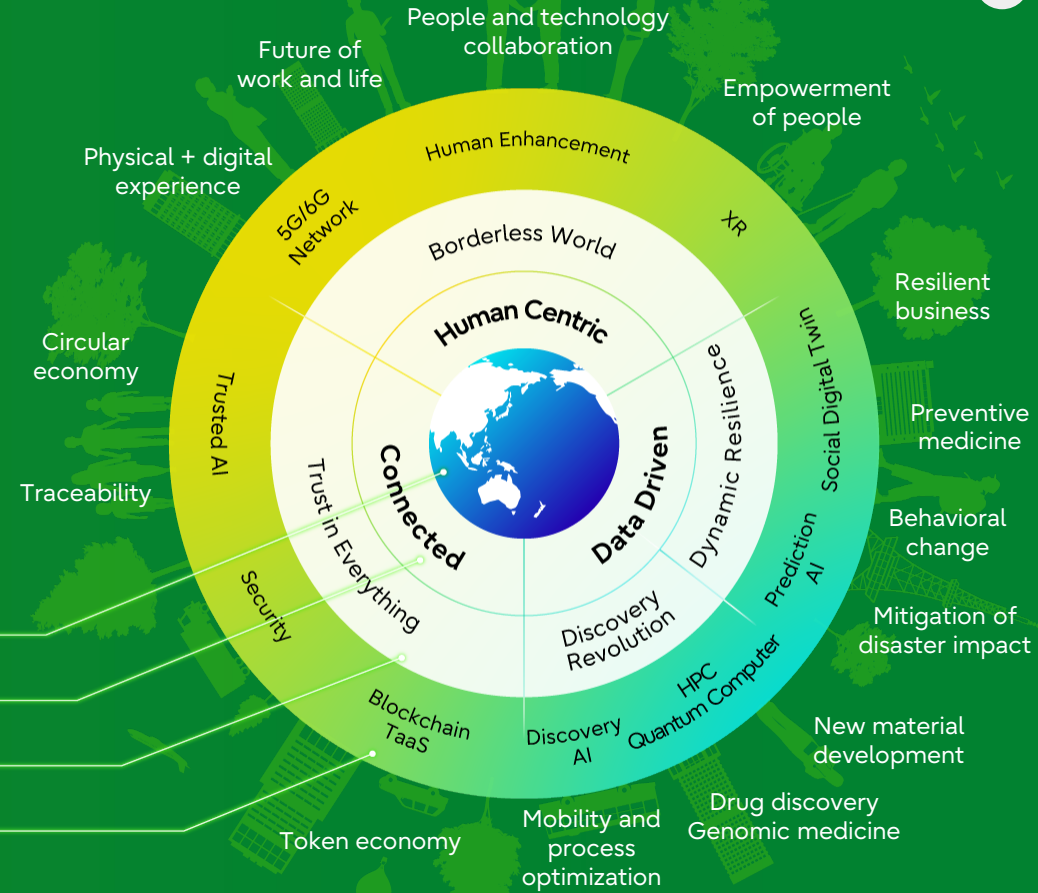
Sustainability transformation is a journey. FT&SV 2022 provides insights on how to begin your journey with purpose-driven leadership and how emerging technologies will help you achieve a more sustainable future. Finally, we introduce the transformational themes of Fujitsu Uvance, describing the challenges and required actions in different business domains.

Purpose oriented to sustainability

Key elements for sustainability transformation

Technology vision

Enabling technologies



# Sustainability Transformation

Module

# 1





# Sustainability is a top management priority

The mindset of business leaders toward environmental, social and economic sustainability has changed rapidly since the outbreak of COVID-19. According to Fujitsu's commissioned survey conducted by Forrester Consulting among 1,800 business leaders across nine countries\*, sustainability is now a higher priority in 60% of organizations compared to two years ago. 41% of respondents told us that sustainability is one of their top three management priorities. For one in six organizations, sustainability is their top management priority.

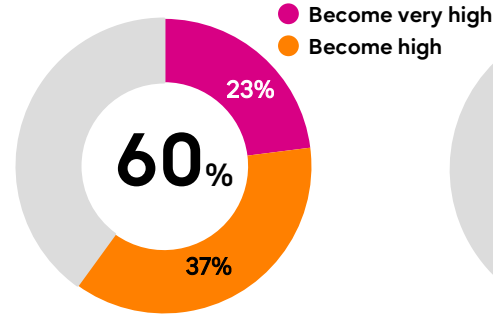
The primary reason for this change is the growing awareness of sustainability among younger generations. Millennials and Generation Z\*\* account for about 60% of today's working age population. In order to attract and retain talent, organizations need to build empathy with these generational groups. They also need to respond to new government regulations and guidelines, and meet growing customer demands for more sustainable solutions. Many business leaders now understand that improving sustainability is crucial to increasing the value of their organizations and services.

Without doubt, sustainability is now a global imperative that organizations must address to achieve mid to long-term growth.

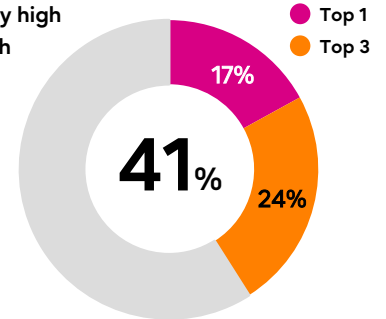
\*Fujitsu's commissioned survey conducted by Forrester Consulting about sustainability transformation among CxOs and decision makers in Japan, Singapore, China, Australia, United States, United Kingdom, Germany, France and Spain in February 2022. (An online survey with partial interviews)

\*\*In this document Millennials is defined as the generation born from 1981 to 1996, and Generation Z is defined as the generation born from 1997 to 2012.

Change in the priority of sustainability in your organization over the last 24 months



Sustainability is top 3 management priority



## Reasons that the priority of sustainability has risen

- 1 Younger generations are aware of sustainability and are having a real impact on business **> 54%**
- 2 Response to government regulations and guidelines **> 49%**
- 3 Improving sustainability increases the value of products and services and the brand value of an organization **> 43%**
- 4 Consumers and customers expect organizations to contribute to improving sustainability **> 39%**



# Sustainability Transformation

Many organizations have already embarked on sustainability transformation.

In many cases, they are integrating sustainability into their business operations well beyond the scope of traditional CSR activities. To make a positive impact on the environment and society, 60% of organizations are already proactively transforming the processes by which they produce products and services. In addition, 45% of organizations have improved the value of their products and services.

Our survey revealed that half of all organizations have set out a sustainability vision, planned an organization-wide strategy and started implementation of the strategy as an integral part of their business. Moreover, one in five organizations is already achieving tangible outcomes from sustainability transformation.

However, only 5% of organizations are true leaders, executing mature sustainability transformation practices. What are these organizations doing?





# Key to success

Through the survey, we have found that purpose-driven leadership is the most important and fundamental driver of sustainability transformation. In addition to setting out an organizational purpose focused on sustainability, CEOs need to evangelize their purpose, encouraging their people to take positive actions to achieve it.

Organizations that are leading in sustainability transformation empower their employees based on their purpose. They use data and digital technology, as well as open ecosystems, to execute transformational actions and deliver outcomes.

## Purpose Driven

- Set out a sustainability-oriented purpose and execute an organization-wide strategy under the strong leadership of the CEO
- Set out financial and non-financial goals and KPIs

## Connected

- Establish an open ecosystem, sharing goals and KPIs
- Share trusted data among ecosystem partners to create sustainability value
- Collaborate and develop partnerships proactively with public sector organizations
- Engage in sustainability-related policy making



## Human Centric

- Help employees to acquire relevant skills
- Empower employees to deliver innovation in agile ways
- Cultivate and realize sustainability ideas from employees across the organization
- Nurture a culture of trust and empathy
- Promote diversity and inclusion

## Data Driven

- Use methodologies such as agile development to improve sustainability
- Use data to create new solutions, continuously improving sustainability value
- Manage organizational data on sustainability in an integrated way, making decisions based on the data
- Securely protect the private data of customers, employees and partners
- Transform business processes to improve sustainability by integrating data and digital technologies



# Digital-first sustainability

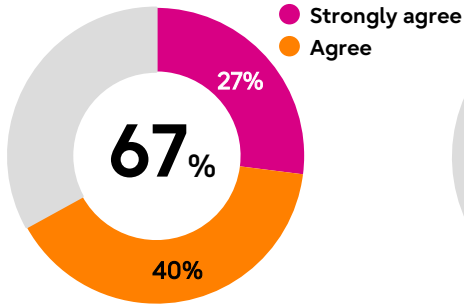
Data and digital technology are essential enablers of sustainability transformation. In our survey, two out of three organizations told us that digital is already helping them to implement sustainability transformation and that they plan to increase their investment in data and digital technologies to support their sustainability initiatives.

For example, some organizations are using digital technology to monitor CO<sub>2</sub> emissions in their organizations and across their value chain. Some organizations also use digital to provide traceability of food or materials, while others are deploying it to enable financial inclusion and more personalized services.

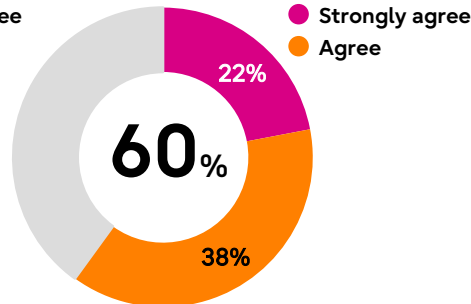
Our survey has also revealed a very strong correlation between digital transformation and sustainability transformation. We found that sustainability transformation leaders also tend to be more mature in their digital transformation practices, typically already delivering tangible outcomes.

A digital-first approach for sustainability transformation is clearly extremely important.

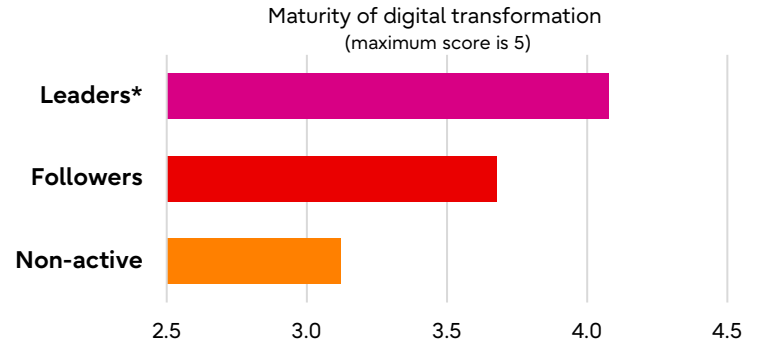
**Digital transformation will help organizations to implement sustainability transformation**



**Plan to increase investment in data and digital technologies to support sustainability initiatives**



**The leaders in sustainability transformation also show the highest maturity in digital transformation**



\*Including leaders and next leaders



# How to overcome challenges

Sustainability transformation is not an easy path. The scope of change might be enormous, requiring mid-to-long term commitment. In the short term, delivering financial value through increasing revenue and profits may be at odds with providing non-financial value to the environment and society. It is very important to clearly define both financial and non-financial KPIs, navigating them to ensure they positively impact each other, driving a growth cycle.

Management must respond to internal resistance and skepticism, ensuring that their vision, strategy and initiatives are well aligned. Creating the right employee mindset and corporate culture is essential to success.

## Challenges of sustainability transformation

- 1** Lack of executive alignment on sustainability vision and commitment to activities of improving sustainability **38%**
- 2** Internal resistance and suspicion of such initiatives **35%**
- 3** The complexity and enormity of the required transformation **30%**

**"Nobody really understood the relationship between percentage improvement in financials and improvement in sustainability."**

Vice President, Operations,  
Chemicals/ Product Goods, United States

**"Our sustainability obligations as a utility firm require us to develop ROI that includes both financial and non-financial metrics."**

CIO, Government Statutory  
Corporation, Australia

**"Our sustainability metrics are set, but not actively tracked, because the technology is not in place yet."**

Deputy Director of ICT,  
Hospital/ Government Institution, United Kingdom





# A journey to a sustainable world

In our survey, most of the organizations leading in sustainability transformation believe that their sustainability transformation activities have improved value for their shareholders, employees, customers, environment and society, in addition to positively impacting financial measures such as revenue, profit and market capitalization. In FT&SV 2021, we predicted that Business to Everyone (B2E), a new organizational model that maximizes value for multiple stakeholders, is emerging. These sustainability leaders are the early adopters of the B2E model.

In order to address our environmental, social and economic challenges, organizations need shared sustainability visions and goals, creating ecosystems that exchange non-financial intangible value and provide the foundations for a more regenerative society. This is the roadmap for the next 10 years.

Technology plays an important role in mobilizing this change. Module 2 discusses the technology visions that will shape a more sustainable future.

**An inclusive and regenerative society**





# Technology Vision

Module

# 2



# A sustainable future

Innovation is key to solving our most pressing environmental, social and economic challenges, helping us envision a very different future 10 years from now.

We believe that the three key elements that will create a more sustainable world are Human Centric, Data Driven and Connected, the concepts we introduced in Module 1. In a networked society, where physical and digital worlds converge, technology can empower people to create continuous innovation.

In this module, we will introduce the four future visions that will drive the next 10 years, based on these three elements. These are extensions of the vision presented in FT&SV 2021.



## Human Centric

Everyone can maximize their potential with dignity.



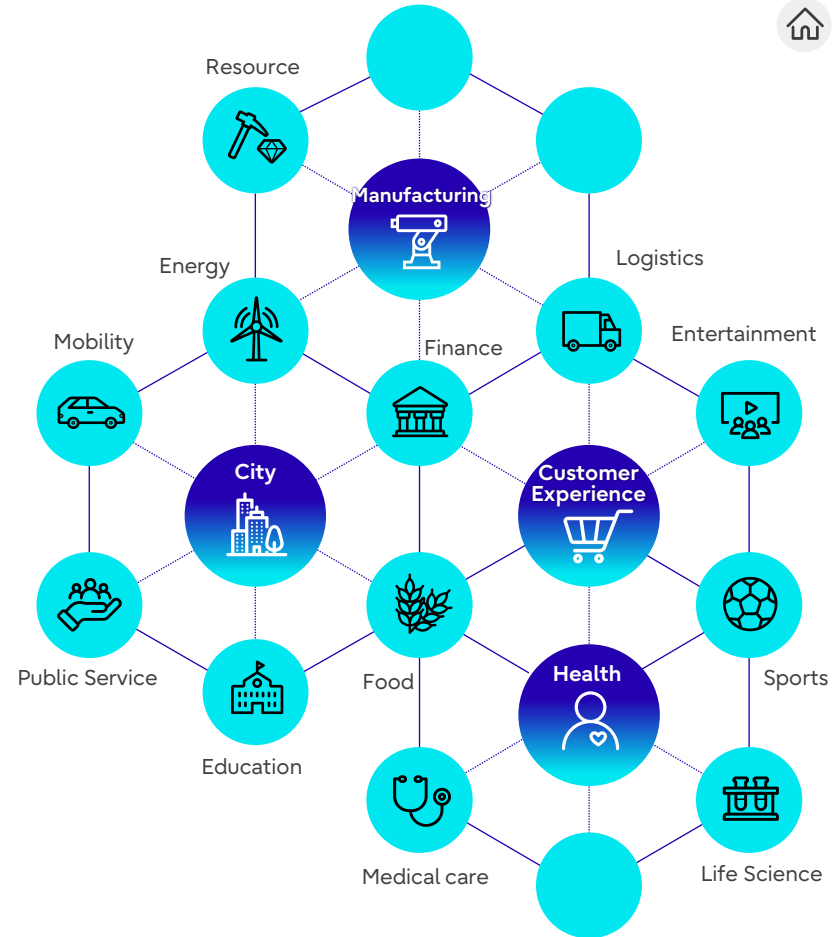
## Data Driven

Data intelligence increases resilience and generates innovation.



## Connected

An ecosystem connecting people, things and services safely and securely.



# Technology Vision

## Borderless World

Physical and digital experiences will converge to realize human centric experiences, empowering people to live fuller lives.



## Dynamic Resilience

Uncertain future scenarios will be digitally rehearsed to build resilience across business and society.



## Trust in Everything

Distributed trust will connect people, things and services safely and securely, supporting a more regenerative society.



## Discovery Revolution

Innovation will be accelerated by using data to combine the creativity of people and technology.





# Borderless World

How can we ensure that everyone can live with dignity? How can we overcome the constraints of our physical condition, age, where we live and our economic situation to maximize our individual potential? How can technology help us achieve this?

We can choose the future we want. Do we want to live in a divided world or an open, borderless world where people are empowered? We believe that creating an open, borderless world is the real purpose of innovation driven by emerging technologies.

Over the next 10 years, we envision a future where physical and digital experiences will become increasingly merged to empower people both at home and in their working lives.



# Physical and digital convergence

The Internet has transformed how people and organizations share information and communicate. In recent years, the Internet has evolved in two pathways.

One pathway enables us all to enjoy better digital experiences, exploiting mobile, photos, video, social media and e-commerce. Online and offline experiences have converged, and the metaverse, an immersive experience in new digital spaces using VR, is expanding rapidly.

The second pathway is the evolution of Internet of Things (IoT), using sensor data to monitor and control the physical world. This is enabling the development of advanced digital twins in various fields, including smart factories.

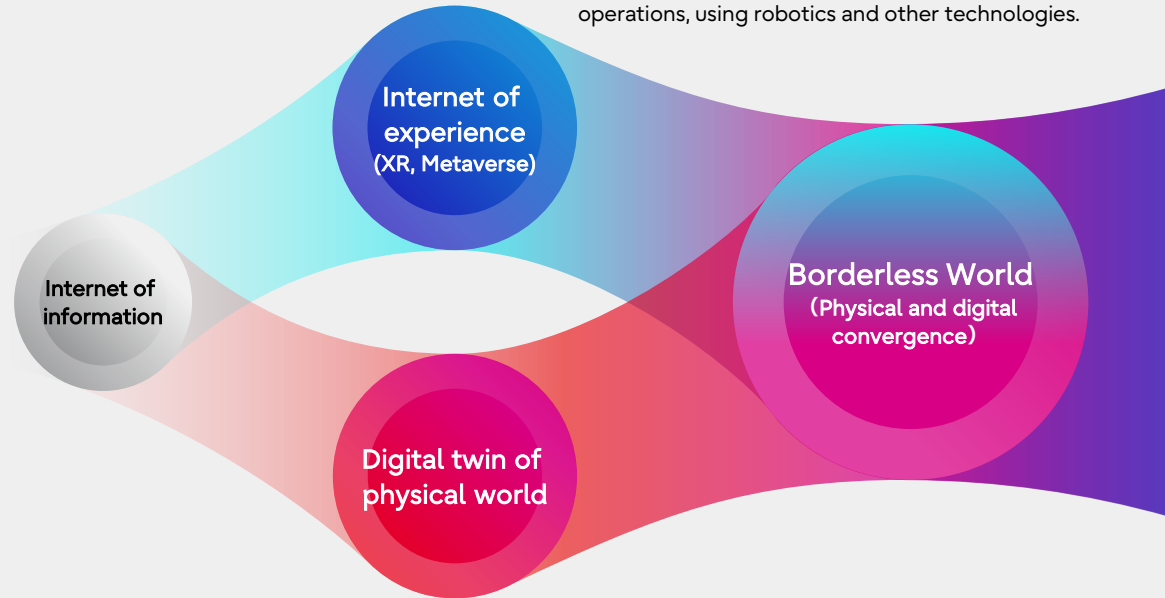
Over the next 10 years, these two parallel evolutions will converge into one, creating a borderless world in which physical and digital are fully integrated. People will be empowered by intelligent services supporting the whole cycle of their lives, from healthcare and mobility through to education and shopping. Governance regulations and rules will be needed to integrate the physical and the digital worlds effectively.

## Evolution of digital experience

Online merges with offline. The metaverse, where people can immerse themselves freely with avatars, is expanding rapidly.

## Convergence of two worlds

The physical world can be reproduced in a digital world, enabling innovative experiences. From the digital world, people will be able to do work in the physical world, for example, such as plant operations, construction, logistics, medical care and space operations, using robotics and other technologies.



## Evolution to controlling the physical world

Cyber-Physical Systems (CPS) continue to advance, using sensor data to visualize and optimally control various activities, from smart factory operations to the dynamics of urban roads and public transport.



# Human-centric network

Intelligent, ultra-fast networks are the foundation of the borderless world, seamlessly connecting the physical and digital environments. These networks support the ecosystems that connect people and services, enabling human-centric experiences. In order to realize a digital experience with realistic resolution, we need mobile radio technology with high capacity, ultra-low latency and multiple connections exceeding the current capacity of 5G. Research and development of 6G technology will accelerate rapidly towards its targeted launch in 2030. End-to-end flexibility and reliability are also required across edges and backbone networks to realize this vision.

Fujitsu is building the networks of the future, from 5G and 6G wireless networks to optical backbone networks. We have already introduced a completely new cloud-native 5G base station based on open standards. Virtualization dramatically reduces the carbon footprint by flexibly changing and streamlining operational resources in response to changing traffic volumes over time and locations. In addition, our quantum-inspired, AI and security technologies are being applied to enable autonomous optimization and create resilient networks.

We are also working with partners to realize photonics-electronics convergence technology towards 2030. This technology will converge photonic and electronic signaling in the end-to-end computing and networking infrastructure, reducing energy consumption significantly. We continue to contribute to developing technology infrastructure that will support a more sustainable society in the future.



**100+** Gigabit /second Experience with reality

10 times faster high-speed communication than 5G enables the dynamic, realistic reproduction of presence, depth and people's five senses.

**1** Micro second End-to-end latency

Beyond the barrier of distance, enabling autonomous driving and remote robot control.



**100%** Virtualized open infrastructure controlled by AI

Achieving both experience and efficiency, as well as resilience to change, using AI and security technologies.

**100x** Energy efficiency

Reducing the energy consumption of the entire infrastructure significantly through photonics-electrics convergence technology.



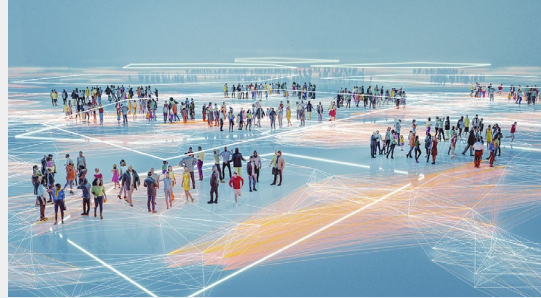
# Empowering people

## Future of work



The pandemic accelerated remote working. Now hybrid working is becoming a new norm. But it is still difficult for workers at factories and construction sites to work remotely. In the future the physical and digital worlds will converge, connected by ultra-high-speed, low-latency networks. This will enable engineering work and on-site operations to be carried out remotely. For example, Fujitsu is enabling the remote operation of construction equipment using a private 5G network, helping to address the shortage of skilled people in the industry.

## Innovative experiences



How will our cities and everyday lives change in the future? We have the opportunity to realize new empowered experiences from physical and digital convergence. For example, we can already explore a different type of metaverse that exactly reproduces a real town as a digital twin. People can enjoy shopping, tourism and various events, buying real items in the digital space and socializing with real residents. What will happen over the next 10 years? Now is the time to explore the exciting possibilities.

## Living with dignity



People with physical disabilities and the elderly may have difficulty in going out, sometimes requiring support from others. Meanwhile jobs for an aging population are increasingly limited, making it hard to find fulfilling work without the necessary expertise. Yet in a borderless world, anyone can realize their potential in a virtual space. For example, by using remote robotics to see the physical world or by using technology to pursue advanced education. To enable everyone to live with dignity, we need to explore new ways to use technology.



# Dynamic Resilience

Human society has survived by using the power of prediction to deal with uncertainty. We are able to respond to major risks, such as famine and natural disasters, by understanding physical world conditions, learning from experience and predicting the future. However, our ability to respond has reached its limits.

We live in an increasingly complex and unpredictable world. How do we deal with pandemics, severe natural disasters or geopolitical disruption? Traditional forecasting techniques, with planning based on historical data, have become powerless.

To respond to uncertainty, the concept of rehearsing the impact of unforeseen situations using digital twin technology is becoming mainstream. By using real-time data to identify signals of potential problems, this technology will enable us to quickly allocate resources either to prevent problems occurring or at least to mitigate their impact.

**Digital  
rehearsal**

**Digital X  
humanities  
and social  
sciences**

**Building  
resilience**





# Digital rehearsal

Digital technology can expand our ability to understand the world and predict what might happen in the future. The evolution of the Internet of Things (IoT) over the past 10 years has made it possible to monitor data from a variety of sensors, visualizing real-time conditions in a dashboard as digital twins. In certain domains, this technology is already helping us to control the physical world dynamically. For example, in smart factories, data analysis is used to predict equipment failures, while supply chain inventory and production lines can be adjusted in real time to respond to changes in demand.

Over the next 10 years, we expect that multiple digital twins, developed separately in areas such as urban mobility, energy, environment, disaster prevention and healthcare, will be connected, with underlying data mutually linked. We will then be able to rehearse complex scenarios in a digital space, for example how urban transport and energy supplies will be affected in the event of a large-scale disaster. This enables us to prepare a response to systemic risks, and to generate prompt and appropriate actions. Digital twin technology will also help us simulate climate change impacts and respond to future pandemics.

## Evolution of Digital Twin



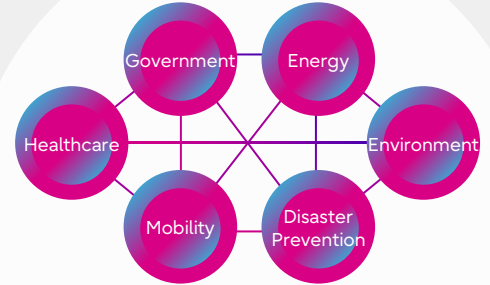
**IoT Sensors**  
Monitoring data



**Digital shadow**  
Visualizing the dynamics of the physical world



**Dynamic Interaction**  
Controlling a specific facility or domain in the physical world



**Federated systems**  
Responding to systemic issues by connecting multiple digital twins and rehearsing real world scenarios



# Digital x humanities and social sciences

## Converging Technologies

Modelling people's increasingly diverse and fluid lifestyles and behaviors with precision presents a major challenge. To do this, we need to combine the data analysis capabilities of digital technology with human-centric insights cultivated by the humanities and social sciences. Fujitsu calls this converging technologies.

By combining ultra-large-scale, real-time digital twins with computing models of behavioral science, we can create social digital twins that digitally rehearse complex urban and social dynamics. Fujitsu is currently pioneering this exciting new approach. We are already providing a digital twin platform that can process data from millions of connected cars in real time. We are also conducting joint research with partners such as Carnegie Mellon University and participating in the UK's National Digital Twin Programme.

One of the major obstacles to progress in resolving complex environmental and social challenges is the diversity of stakeholders. The social digital twin will help all stakeholders, including policymakers, businesses and citizens, to transparently understand where we are today and what will happen if we do not change our behaviors. In addition, the social digital twin can also simulate the different futures possible if we do change our behaviors. In this way, the social digital twin will provide a platform that allows all stakeholders to openly discuss which policy options are most beneficial and most closely aligned to the common good of society.



## Social Digital Twin

Simulation of real-world scenarios combining insights of behavioral sciences

Dynamic real-time digital twins

Physical World



# Building resilience

## Resilient cities



What can we do to make our cities more sustainable and more resilient? The social digital twin will help us to digitally rehearse how many drivers will opt to use alternative public transport if the authorities dynamically change road pricing and public transport fares. We can also use this approach to influence the behaviors of drivers, for example by allowing them to understand how much CO<sub>2</sub> emissions can be reduced.

## Mitigating disaster impact



The social digital twin will help us to digitally rehearse what could happen in the event of disasters. For example, Fujitsu has worked with academic institutions to simulate the impact of tsunamis with high precision using the supercomputer Fugaku. We have also developed an easy-to-use prediction application for smartphones, ensuring people can evacuate more quickly and safely in the case of tsunami alerts.

## Resilient business



In the face of unexpected pandemics and geopolitical uncertainty, a single optimal global production model is no longer viable. The key to management strategy is balancing efficiency in normal times with resilience in the event of an emergency. What kind of data will be required to do this? How can we digitally rehearse future scenarios and how quickly can we execute Plan B and Plan C by sensing data in real time?

# Discovery Revolution

Innovation generated by new knowledge continues to drive social and economic progress. At the same time, the impact of this progress on the global environment has become a major challenge. We need to accelerate innovation to solve the problems we have created.

It often takes years of experiments in labs and in the field to discover new knowledge and generate innovation. Now, however, innovation timescales can be shortened from years to months – or even days. This is being achieved by exploiting ever-increasing computing power to enable ultra-high-speed simulation and next-generation AI technology to formulate hypotheses and infer causalities.

In a borderless world, creative collaboration between people and technology will continue to accelerate innovation.





# Computing as a Service

Computing power continues to evolve beyond Moore's Law. Quantum computers are expected to be in practical use by around 2030. Quantum computers can process significantly larger data sets than conventional computers for certain types of problems and solve complex problems such as quantum dynamics calculations with a very high speed. In contrast, conventional high-performance computing (HPC) can perform a very wide range of applications. How can we make such ultra-scale computing power more widely available to research institutions and businesses?

Megatrends over the next 10 years include the democratization of ultra-scale computing power. The computing power of HPC, quantum-inspired computers, and quantum computers will be delivered as a service through the cloud. These different types of computing resources will be automatically identified and optimized for different types of workloads. This will enable researchers and organizations to perform complex optimization calibrations and simulations as well as large-scale machine learning with high speed and convenience. This will dramatically accelerate innovation across a wide range of fields, from drug discovery and new material development through to engineering.

Fujitsu is actively engaged in joint research into quantum technology with various academic research institutes and partners, including the joint development of a superconductive quantum computer with RIKEN. We have also developed the world's fastest 36 qubit quantum simulator running on an HPC infrastructure. We are now working with partners to develop practical applications that exploit the superpower of quantum technology.

Healthcare   Materials   Finance   Science   Engineering



## Computing Workload Broker Cloud Platform

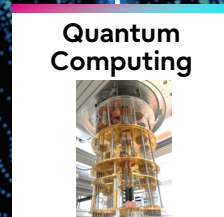
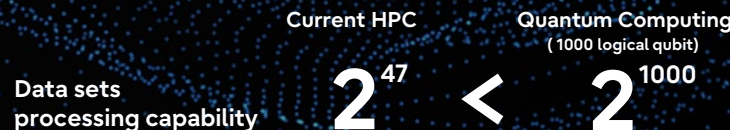
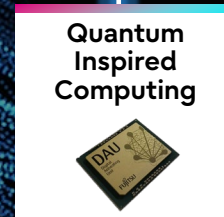


Photo: Riken



# Creativity of people and technology

Since 2012, we have seen a significant advance in the accuracy of recognition by deep learning technology. This new technology has brought rapid evolution of AI technology in computer vision and natural language processing. What further breakthroughs are we expecting in AI over the next 10 years?

Deep learning technology has the advantage of quickly finding correlations between vast amounts of data. However, inferring causal relationships and carrying out hypothesis testing has previously been a major challenge. By 2030, we expect to see mature AI technologies that autonomously infer causal relationships between vast amounts of data and generate and verify hypotheses creatively. Fujitsu has already developed an AI technology that can generate hypotheses autonomously. In addition, we have developed Discovery AI technology that can generate causality graphs between large-scale data, and we are now exploring practical applications with our partners. Combined with ultra-scale computing power, this is contributing to innovation across various fields, including genomic medicine and material informatics.

We do not see AI taking people's jobs in the future. Instead, we see people and AI working together to accelerate innovation. In order to achieve this, AI technologies need to be trusted by people, embracing fairness, accountability and transparency. Fujitsu is a founding member of AI4People, the first multi-stakeholder forum on AI ethics. This led us to set out the Fujitsu Group AI Commitment. In addition, we are working on the practical application of ethical AI technology\* to eliminate bias and discrimination.



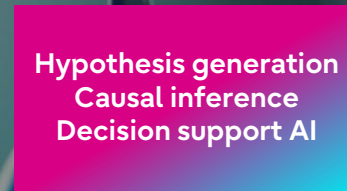
Past 10 years

Next 10 years

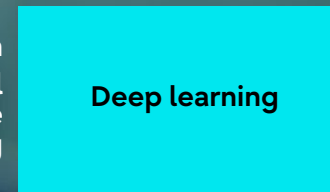
Inference  
Decision making



Hypothesis generation  
Causal inference  
Decision support AI

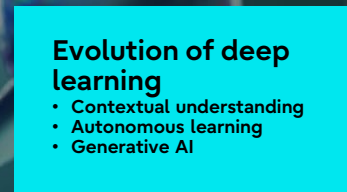


Recognition  
Natural Language Processing



Deep learning

Evolution of deep learning



- Contextual understanding
- Autonomous learning
- Generative AI

**\*Ethical AI**

For example, Fujitsu offers a resource toolkit that provides guidance for evaluating the ethical impact and risks of AI systems based on international AI ethics guidelines free of charge to promote the safe and secure deployment of AI systems in society.



# Accelerating discovery

## Drug discovery



The use of HPC and quantum computing technologies in digital laboratories is accelerating the drug discovery process. For example, in collaboration with Fujitsu, PeptiDream, a leading bio-venture company, is using Digital Annealer\* and HPC to narrow down the vast number of candidate compounds for medium-molecular drug discovery and accelerate the related molecular dynamics simulation processes.

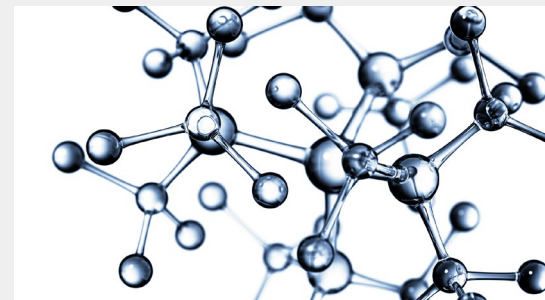
\*Quantum inspired computer

## Genomic medicine



We are working to realize effective personalized medicine for cancer with minimal side effects by identifying causal relationships between human genome information and drug effects. Using the supercomputer Fugaku, Tokyo Medical and Dental University and Fujitsu analyzed the large-scale graph structure of all 20,000 human genes. Using Fujitsu's Discovery AI technology, we have succeeded in visualizing the causal relationship between genes and the drug resistance of anti-cancer drugs. We continue our efforts to analyze information of all 3 billion human genomes.

## Material informatics



To overcome our difficult environmental challenges, we have to develop new materials, such as new catalysts for artificial photosynthesis and for synthesizing ammonia and hydrogen production. These are possible next-generation energy sources. Fujitsu is contributing to new materials innovation by combining our Discovery AI technology with ultra-scale computing power. For example, Fujitsu is collaborating with Atmonia, an Icelandic startup, to accelerate the discovery process of a new catalyst to synthesize clean ammonia.





# Trust in Everything

Cyber attacks are intensifying, targeting not only data and IT systems, but also physical social infrastructure such as energy networks. Meanwhile, people are increasingly concerned about the proliferation of fake news and untrustworthy data, as well as invasions of privacy.

The loss of trust in technology also poses a major challenge. People are worried that AI technology may produce biased judgements. We are entering an era of zero trust, where there is no place left in the world with absolute peace of mind. As a result, we are forced to doubt everything.

We used to focus on protecting the boundaries of organizations. In a borderless world, however, we have to ensure trust of people, data, systems and devices that are connected to the network.



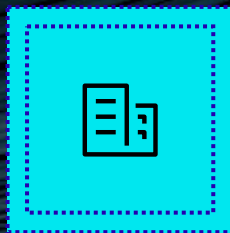


# Trust in a borderless world

What is trust? We live in an increasingly complex society with diverse populations. If you do not have trust, it is hard to truly feel safe. Trust is a mechanism that reduces the complexity of society. Industrial structures used to be fixed vertically. Today these are rapidly changing to open, distributed network structures, such as new mobility services, an API economy across finance and retail, as well as distributed power networks. As physical and digital experiences converge in a borderless world, the complexity of society will continue to grow.

Traditional, centralized organizational trust alone is unable to cope with this increasing complexity. To protect a borderless world, autonomous distributed trust technology becomes essential. We need to ensure the trust of everything connected to the network across both the physical and digital spaces.

## Organizational Trust (Closed and centralized)



Perimeter defence

Now  
entering  
Zero Trust

## Distributed Trust (Open)



Trust in Everything



# Distributed trust

While the borderless world empowers people to realize a society where no one is left behind, it also poses significant challenges. How can you trust people you meet in a digital space like the metaverse? Photos and videos can be easily created using AI technology. Your private data might be processed anywhere in the world. How do you know that money you receive has not been previously laundered from elsewhere? How can you verify the authenticity of the data and assets you are exchanging?

Distributed trust technology is becoming essential to overcome these challenges. Fujitsu has been providing identity and privacy-related technologies, including decentralized ID, multi-biometric authentication and privacy protection. In addition, we are focused on developing data trust technologies that ensure the authenticity of data to facilitate data exchange. We are also strengthening the security of the networks and AI systems that underpin our social infrastructure, while developing trust technology that ensures access to people, systems and devices across physical and digital spaces.

As sustainability becomes a global imperative, intangible, non-financial value such as environmental value is holding greater weight for both business and society. We are now working on technologies that connect multiple blockchains and allow the free flow through of tokens, enabling end-to-end traceability across connected ecosystems.

## Identity and privacy

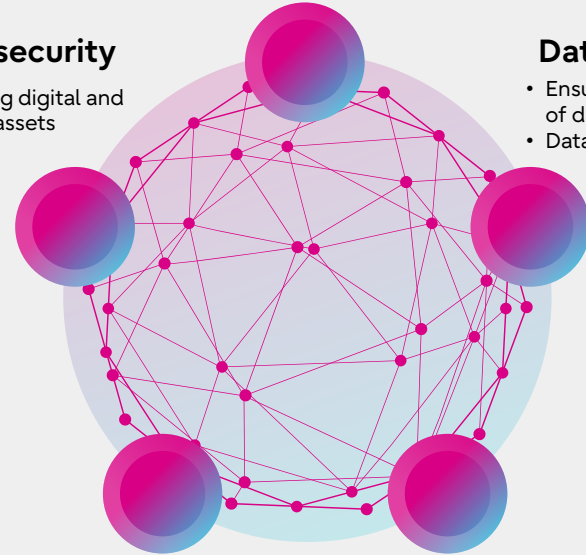
- Decentralized ID
- Biometrics
- Privacy-enhancing computation

## Cyber security

- Protecting digital and physical assets

## Data trust

- Ensuring authenticity of data
- Data exchange



## Physical-digital trust

- End-to-end connected trust across a borderless world

## Token economy

- Evolution of blockchain
- Traceability
- Exchange of intangible value



# Rebuilding trust

## Identity innovation



In contrast to the prevalent centralized identify management by specific digital services, new decentralized identity management technology is now attracting greater interest.

Fujitsu has developed a self-sovereign and decentralized digital identity exchange technology as a key enabler of the borderless world. We are now working with various partners to explore practical applications of this exciting technology.

## Data exchange



As digitalization progresses, there is a growing need to verify the authenticity governmental and industrial data transparently. Fujitsu has developed Transparent Trust Transfer technology that prevents tampering of business data exchanged between private and public organizations, ensuring their authenticity. Together with our partners, Fujitsu is actively promoting Trust as a Service based on this technology.

## Regenerative society



Stakeholders are becoming increasingly interested in how organizations reduce their CO<sub>2</sub> emissions, ensure human rights and procure materials responsibly throughout their end-to-end value chains. It is becoming very important to verify, tokenize and distribute such non-financial information throughout society. Fujitsu is now using blockchain technology to enable organizations to build traceability across their global supply chains and transparent trading platforms for both rice and water, helping to create a truly regenerative society.

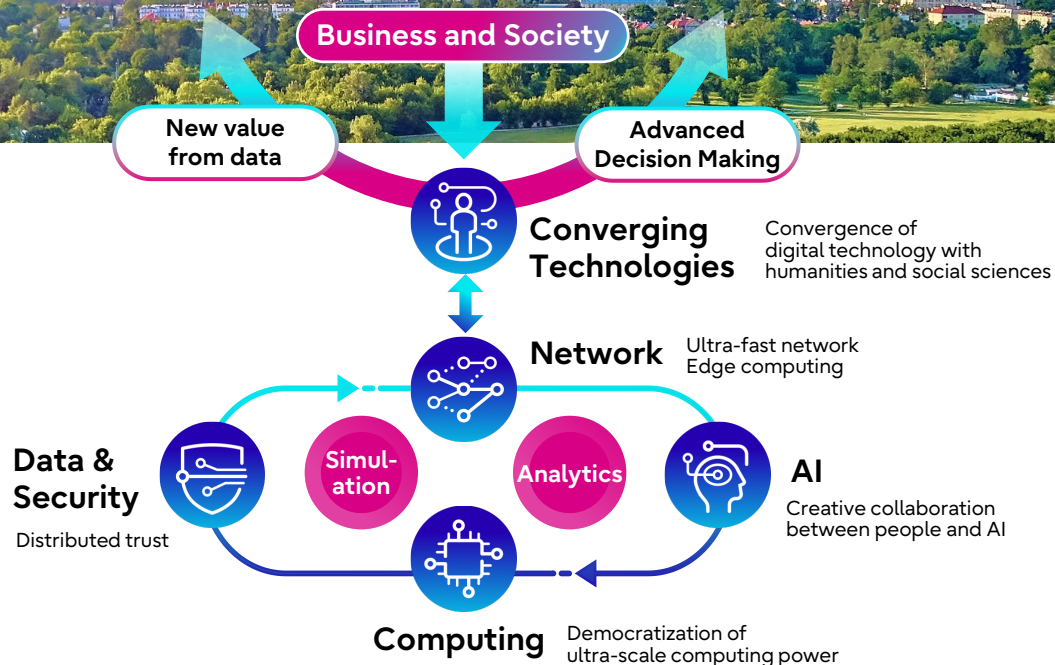


# Creating sustainable value



Key digital technologies need to be integrated in order to drive the future visions presented in this module.

Fujitsu continues to seamlessly merge computing and network technologies, giving many more people easy access to ultra-scale computing power. Using this next-generation technology infrastructure, we are helping to accelerate the discovery of new knowledge by allowing people and AI work together creatively. We are also converging digital technologies with humanities and social sciences to enable the dynamic simulation of cities and society. Finally, we are helping to introduce distributed trust across network, ensuring the required levels of trust throughout the borderless world.





# Fujitsu's cutting-edge technologies

Fujitsu focuses its resources on five technology areas, engaging in open collaboration with partners, academics and research institutes around the world. To drive a better future for all, we are now exploiting these technologies to help organizations transform their business processes and deliver greater sustainability value.



## Computing

- High Performance Computing
- Digital Annealer, a quantum inspired computer
- Quantum computer
- Quantum simulator



## Network

- 5G Open RAN with cloud-native virtualized architecture
- Optical networks
- 6G technology
- Photonics-electronics convergence technology
- Optimization of networks by AI



## AI

- Trusted AI technology including Explainable AI and Ethical AI
- Discovery AI to find causal inferences of large-scale data
- Automation of machine learning



## Data & Security

- Multi-biometrics authentication
- Decentralized ID (IDYX)
- Connection chain technology to connect multiple blockchains
- Transparent trust transfer technology to ensure data authenticity
- AI Cybersecurity



## Converging Technologies

- Real time dynamic digital twin infrastructure (Dracena)
- Social digital twin technology
- High-precision automatic sensing and recognition technology (Actlyzer)



# Transformation of Business and Society

Module

# 3





# First step

How can you navigate your sustainability transformation journey towards a better future?

The world faces a wide range of challenges, from climate change, energy transformation, environmental conservation and biodiversity through to human rights, food safety, health, an aging population, urban problems and global supply chain resilience. Organizations need to prioritize which challenges they will address by considering their specific industry and business characteristics.

In Module 2, we presented four visions that evolving technologies will drive to make the world more sustainable. In Module 3, first, we will share stories of organizations that are already pursuing these visions on their transformation journeys. Finally, we will introduce Fujitsu Uvance, our new business focusing on sustainability transformation. We will explore the critical challenges that need to be addressed and how our vision can be realized across selected vertical and horizontal areas.

**Borderless  
World**



**Borderless  
way of working**

**Dynamic  
Resilience**



**Sustainable  
cities**

**Discovery  
Revolution**



**Future of cancer  
treatment**

**Trust in  
Everything**



**Safe water for  
everyone**





## Borderless way of working


Hybrid working styles have become the new normal since the outbreak of COVID-19. Early in the pandemic, Fujitsu successfully moved our 130,000 global people to a remote working model, introducing Work Life Shift to empower them to choose how they wish to work.

Our motivation behind this significant shift is the well-being of our people. We aim to create an environment where diverse people can work with autonomy and mutual trust, free from constraints of fixed locations or rigid working hours. In this new working environment, we encourage our people to deliver value to customers and help transform society continuously.

In the two years since this new working style was introduced, we have seen tangible improvements in both productivity and engagement. The challenge now is to further increase well-being and accelerate innovation. We believe this can be achieved by creating borderless synergies between the physical and digital working experiences, helping our people achieve the optimal balance between their work and private lives.

Fujitsu recently conducted a global joint survey into hybrid working, collaborating with HSM Advisory, the organization founded by Professor Lynda Gratton from the London Business School, a leading thinker in workstyle transformation. The survey confirmed that sharing a deep sense of purpose and developing a connected place for employees to nurture innovation in the remote workplace are essential for delivering sustainable high performance.

We will continue to evolve Work Life Shift by incorporating feedback from our people. We are also using this experience to drive our customers' transformation.



“The way we work has changed considerably. As we redesign work and shift to a hybrid model, each organization needs to build their own story and their own signature.”

**Lynda Gratton**

London Business School Professor/HSM Advisory Founder

# Sustainable cities

Cities around the world continue to expand. This is causing major societal challenges, from CO<sub>2</sub> emissions through to the economic cost of traffic congestion. Private and public sector organizations are implementing a range of initiatives in response, including shared micro-mobility services using bicycles and e-scooters. While these schemes are being implemented in many countries, they have their challenges. For example, how can you monitor usage status in real time, and how do you prevent people abandoning bicycles and e-scooters, obstructing traffic and pedestrians?

Hexagon and Fujitsu are collaborating on the development and implementation of a smart monitoring solution that collects data from bicycles, e-scooters, cars and various sensors in the city, enabling accurate, real-time monitoring of mobility conditions. The solution creates a digital twin using spatio-temporal information, comparing it with historical data to analyze patterns of usage time and locations. This is helping to improve services, including the installation of new e-scooter stations.

Transport planners in Munich have also taken up this challenge, with a pilot Proof of Concept project exploring the management of shared mobility. This project has now been completed. A SaaS solution has enabled the city to track, visualize and analyze IoT data from a variety of mobility providers, helping them monitor shared vehicles, such as e-scooters and bicycles. The planners were able to create a comprehensive picture of Munich through a dynamic digital twin of the city, a real-time digital representation of the physical world. This digital twin has allowed them to test new processes virtually before actual deployment.



**“Shared mobility is now a big issue around the world. Our system will help to better identify and understand transport patterns, with the goal of improving future city mobility.”**

**Maximillian Weber**

SVP, EMEA, Safety & Infrastructure and Geospatial divisions, Hexagon




## Future of cancer treatment

The treatment of serious diseases is essential to improve individual quality of life and to reduce social healthcare costs. To contribute to advances in cancer treatment, Fujitsu has been working with various universities, research institutes and hospitals, using our innovative Explainable AI technology. We are conducting research and development to visualize the relationship between cancer, genetic variants and drug treatments to support medical professionals.

Since November 2019, Aichi Cancer Center and Fujitsu have been collaborating on the development of AI systems for use in clinical practice. Experimental data on the effects of therapeutic agents by cancer types and genomic information in external databases, which are sorted and managed based on different keywords and rules, remain difficult to use. Combining the know-how of Aichi Cancer Center in drug selection and Fujitsu's AI technology, we have developed a new solution that can sort and combine these data under common keywords and a single data format and generate a structured data of knowledge, called Knowledge Graph.

This solution enables physicians to find the medications that are expected to be highly effective for each patient, contributing to a significant reduction in the time required to predict drug efficacy, as well as to search for data providing evidence for their estimations. It will help physicians to effectively and precisely select the medications with the best possible outcome based on patients' genomic variants, resulting in the improved treatment efficacy and avoidance of unnecessary treatments.

Aichi Cancer Center and Fujitsu continue to work together to apply AI technology for precision cancer medicine.



**"It is important to quickly provide as much reliable information as possible to physician for personalized cancer treatment. I highly expect that AI genomic medicine will assist physicians in their decision-making."**

**Issei Imoto, M.D., Ph.D.**

Director, Research Institute, Aichi Cancer Center

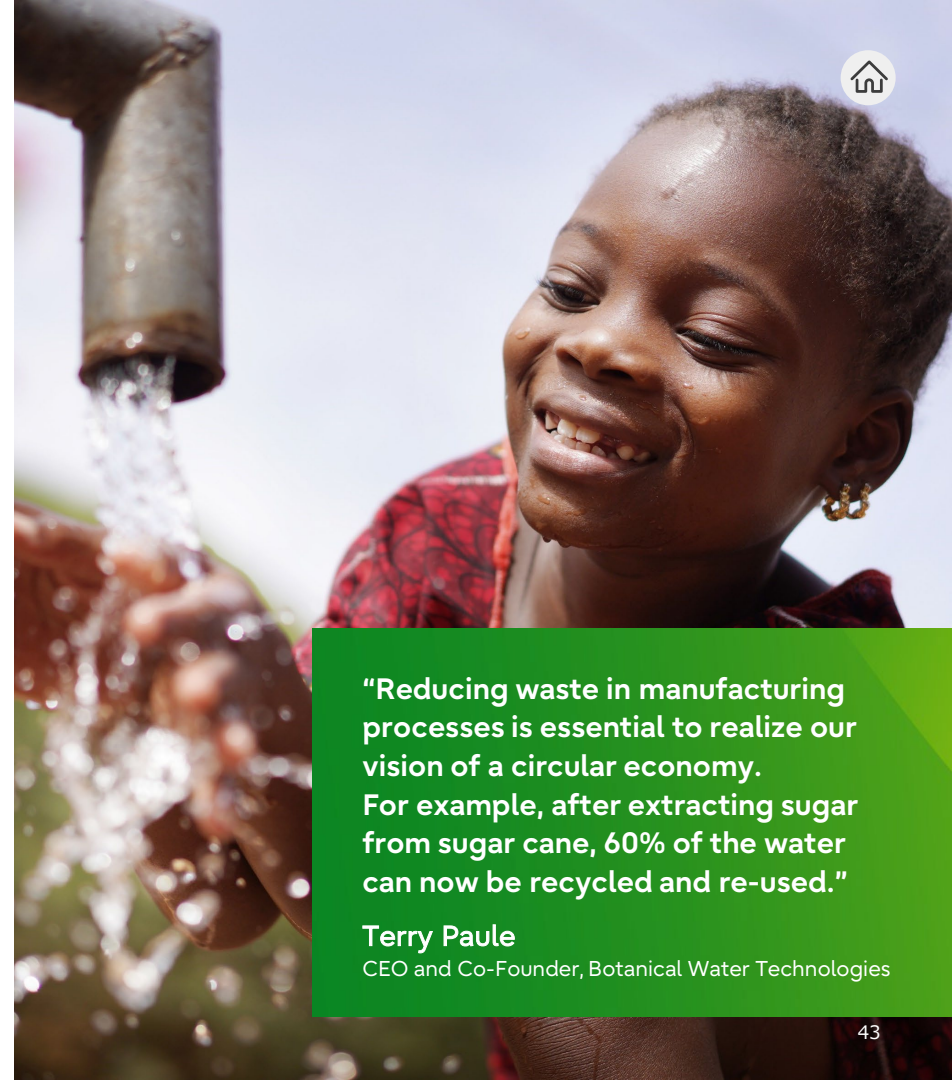
## Safe water for everyone

Around the world, more than two billion people live without access to clean water and sanitation. Yet, every year, we waste millions of gallons of water in the preparation of fruit and vegetables in food factories, with a huge impact on the environment.

Botanical Water Technologies (BWT) based in the UK has developed an innovative technology that can refine and recycle the water previously discarded by food processing operations. BWT selected Fujitsu as key technology partner, and jointly developed the world's first blockchain-based water exchange platform (Botanical Water Exchange), to create a safe and secure marketplace for water and water impact credits trading.

Juice and sugar mills, for example, can now accurately trace botanical water through each step of their production process, from refinement through to sales, delivery and usage. At the same time, botanical water can now be sold to other food and beverage manufacturers or recycled internally as a new source of reusable water.

Through this initiative, BWT and Fujitsu are promoting their vision of a circular economy, reducing waste and providing a significant new source of clean water.



**“Reducing waste in manufacturing processes is essential to realize our vision of a circular economy. For example, after extracting sugar from sugar cane, 60% of the water can now be recycled and re-used.”**

**Terry Paule**

CEO and Co-Founder, Botanical Water Technologies

# Fujitsu Uvance

To realize our purpose of making the world more sustainable by building trust in society through innovation, Fujitsu is working with our customers to address key cross-industry challenges. To drive this objective, we recently launched Fujitsu Uvance as our new business focus oriented for a better future.

Through Fujitsu Uvance, we are building new possibilities by connecting people, technology and ideas, creating a more sustainable world where anyone can advance their dreams. Using our advanced technologies, skills and knowledge of different industries, we will provide human-centric services, data-driven resilience and connected ecosystems to drive sustainable transformation.

In this section, we explore how Fujitsu Uvance is impacting key industry themes across sustainable manufacturing, consumer experience, healthy living and trusted society, and how this is enabled by digital shifts, business applications and hybrid IT.



## Vertical Areas



Sustainable  
Manufacturing



Consumer  
Experience



Healthy  
Living



Trusted  
Society

## Horizontal Areas



Digital Shifts



Business Applications



Hybrid IT



# Sustainable Manufacturing

The world faces extreme uncertainties. From the COVID-19 pandemic through to the recent crisis in Ukraine, we see a level of disruption to the global economy and people's lives that we have not experienced for decades. Global supply chains have been fractured, causing a worldwide shortage of semiconductors for example, while we are also experiencing soaring prices of natural resources. Globalization strategies, such as basing production in optimal locations to drive efficiency, are having to be fundamentally reviewed.

All stakeholders now expect organizations to take proactive action to address global challenges such as climate change, environmental pollution and destruction of natural ecosystems. In addition, organizations have an expanded responsibility not only to environmental sustainability but also to the dignity and well-being of their employees and all people throughout their global value chains. With an increasingly aging population in many countries, they also need to transfer the knowledge and skills of experienced workers to new generations.

What kind of medium to long-term strategies are required to address these challenges and realize a more sustainable future? By using data and digital technology, we believe organizations can strengthen resilience to uncertainties and transform business value to enable people and the planet to co-exist successfully.





## Coexistence of people and the planet

Backed by 87 years of experience in manufacturing, Fujitsu is driving digital transformation across engineering, production and supply chains. Leveraging our experience and cutting-edge digital technologies, such as AI and digital twins, we are helping organizations to improve resilience and transform into truly sustainable businesses, ensuring people and the planet can co-exist successfully.

### Carbon Neutrality

#### Monitoring and reducing CO<sub>2</sub> emissions

We help organizations to formulate strategies and measures to achieve carbon neutrality by visualizing CO<sub>2</sub> emissions throughout entire supply chains.

### Value Chain Optimization

#### Creating a regenerative society

We enable traceability throughout value chains to optimize supply and demand, promoting a circular economy that encourages the effective re-use of resources.



### People Enablement

#### Collaboration between humans and robots/AI

We empower people from design and production to maintenance through process automation. We use digital technology to help resolve labor shortages and enable transfer of skills from experienced workers.

### Enterprise Visualization

#### Visualizing processes to support decisions

By visualizing the present and forecast status of business activities with financial and non-financial KPIs, we help agile, data-driven decision making in response to dynamic changes.

### Resilient Supply Chain

#### Improving responsiveness to uncertainty

We enable the autonomous reconfiguration of global supply chains in response to disruptive events by simulating and sensing potential risks.

# Consumer Experience

How will consumption styles evolve over the next decade? Millennials and Generation Z are expected to account for nearly 70% of the working age population by 2030, also becoming the majority of consumers. These generational groups are highly aware of the need to protect the global environment, supportive of ethical business practices and keen to choose experiences that reflect their values, beyond material considerations like brand and price. To successfully engage with these groups, organizations need to demonstrate relevance, empathize and resonate.

As lifestyles and individual values become more diverse, markets are becoming increasingly borderless. Online and offline experiences are merging. In many cases, the boundaries between consumers and organizations are blurring, with consumers actively participating in ongoing product and service development. Many business services such as retail, payment, financing and logistics are now provided 'as a service' through the cloud. These diverse services are then being connected through digital interfaces, seamlessly embedded into consumers' everyday lives.

The successful exploitation of data and digital technology is key to enabling modern businesses to adapt to these more personalized and sustainable consumption styles.







# Sustainable consumption

To help create a sustainable future, we need advanced retail as a service to enable more diverse and personalized purchasing experiences. We also need to build sustainable supply chains and new mechanisms for value exchange between individuals and organizations. Fujitsu is focused on enabling new consumption models that allow consumers to contribute more easily to environmental and social sustainability through their daily lives.

## Smart Retail

### Driving personalized value through physical and digital convergence

Digital technology connects consumers and sellers in a borderless world, providing personalized services tailored to individual needs, optimizing consumer experience.

## Smart Platform

### Creating a new economy based on exchange of data and intangible value

Using distributed trust technology, we are exploring new platforms capable of distributing various intangible values across countries and industries.



## Smart Enterprise

### Increasing agility with automation and data

Employee experience and productivity can be improved by automating operations and reducing routine workloads. Market strategies can become more agile, using data to sense and predict changes both in consumer behavior and the extended value chain.

## Smart Supply Chain

### Encouraging sustainable consumption

We are encouraging ethical consumption and reducing waste by enhancing traceability throughout global value chains.



# Healthy Living

COVID-19 continues to pose a significant threat to people's health, while increasing the burden on healthcare workers around the world. Accelerating the release of new vaccines and therapeutic drugs has become increasingly urgent. Without doubt, the crisis has highlighted the importance of resilience and speed of response at times of great uncertainty.

In addition, as many countries experience an aging population, maintaining people's quality of life has become a major challenge. How can we help people live healthier lives, both physically and mentally, regardless of their age, gender, or location?

Data and digital technology can help people achieve the goal of healthy living. An important step is to bring together critical health data previously dispersed across hospitals, universities, research institutes, companies and governments. By enabling data-driven insights, this will help to support patient journeys more effectively, from prevention and prognosis through to the treatment of diseases. As well as improving patient journeys, the exploitation of digital technologies such as HPC and AI is also helping to accelerate the development of new drugs and new method of treatment.





# Expanding individual potential

We are pursuing several initiatives to create a world where people can maximize their life experiences and realize their full potential.

## Self-reliant

### From treatment to prevention

We help people to monitor and manage their health status remotely, preventing illness and reducing physical hospital visits. We enable personalized support by exploiting complex data analysis, including genome information.

## Seamless

### Healthcare embedded in everyday life

We enable integrated, end-to-end healthcare journeys, from prevention through to treatment and prognosis, by developing digital ecosystems that connect healthcare and related service providers.



## Ignite

### Free from constraints

Augmented reality, virtual reality and robotic technology have the potential to expand people's mind, body, physical senses through to the way they interact and connect. The technology helps people to maximize their potential, free from constraints such as age and disability.

## Enhance

### Enabling more healthcare options

We are exploring innovative approaches in healthcare, including drug discovery and development, by exploiting advanced computing, AI, data analytics and other emerging digital technologies. This is helping to increase the options available for both treatment and care plans.

# Trusted Society

In many parts of the world, cities have become complex ecosystems in which infrastructure services such as energy, transport and local government have become closely linked. What can be done to reduce environmental impacts in these cities? How can we make them more resilient to uncertainty and develop inclusive public services that ensure that no one is left behind? How can we make these connected urban ecosystems more sustainable?

We have to build a sustainable society, ensuring that people are able to respond to change positively, and live safer, more fulfilled lives. Digital technology is key to visualizing the dynamics of these connected urban ecosystems, assessing potential risks and future scenarios by leveraging real-time data. Digital technology can also effectively connect people with services, involving them in the ongoing process of creating a more trusted society.





# A prosperous and sustainable society

We are helping to create trusted services and urban resilience, by enabling human-centric public services, sustainable energy sources and transport with low environmental impact. Our aim is to realize a prosperous and sustainable society.

## Human-centric Public Services

### Inclusive public services with citizen participation

We are pioneering the vision of new public services, based on involving citizens and encouraging collaboration between public and private sectors. We are also enabling personalized services that ensure no-one is digitally excluded.

## Sustainable Transportation

### Sustainable mobility for people and things

We are helping to build inclusive mobility services available for all, while enabling resilient transport services with low environmental impact. We are using technology to address various related social challenges including air pollution, noise, congestion and accidents.



## Sustainable Energy Cycle

### Decarbonized society by clean energy

We are enabling the shift from a society based on fossil-based energy sources to a new regenerative society. We are doing this by connecting various energy sources, including renewable energy, with storage batteries and electric vehicles. We are also enabling a more resilient energy supply by using real-time data to forecast and orchestrate supply and demand.



# Digital Shifts

## A new form of business

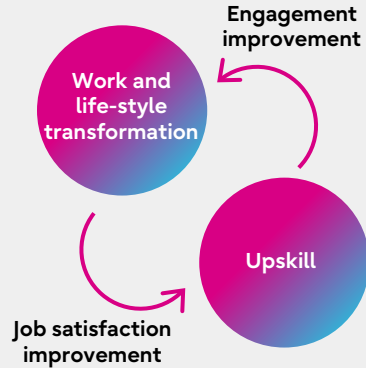
Successful sustainability transformation requires both the empowerment of people and the advanced exploitation of data. It also requires new, creative ways of working, where diverse communities of people can collaborate through hybrid working, free from the traditional constraints of place and time.

We also need to establish data-driven approaches that organically connect and analyze data from across their organization to detect signs of change, consider future scenarios and enable agile actions. At Fujitsu, we are now using our own transformation experience to support the digital shift of organizations.

## Work Life Shift

**Providing a flexible work environment to help employees work autonomously**

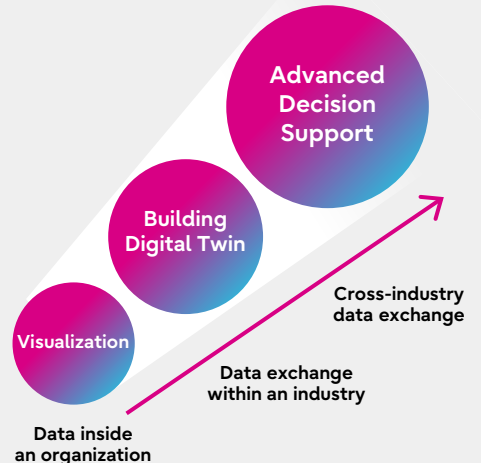
With Work Life Shift, we can seamlessly converge physical and digital workplaces to allow employees to choose where and when to work, to improve their job satisfaction and well-being. At the same time, we can use digital channels to deliver new learning opportunities, encouraging upskilling, supporting personal growth and improving productivity and engagement.



## Data Driven

**Sophisticated decision making by data-driven intelligence**

We help decision making by connecting different types of data across the organization, dynamically visualizing key business processes and analyzing possible future scenarios. In the future, we will enable the creation of new value by connecting and analyzing data from multiple organizations and industries.





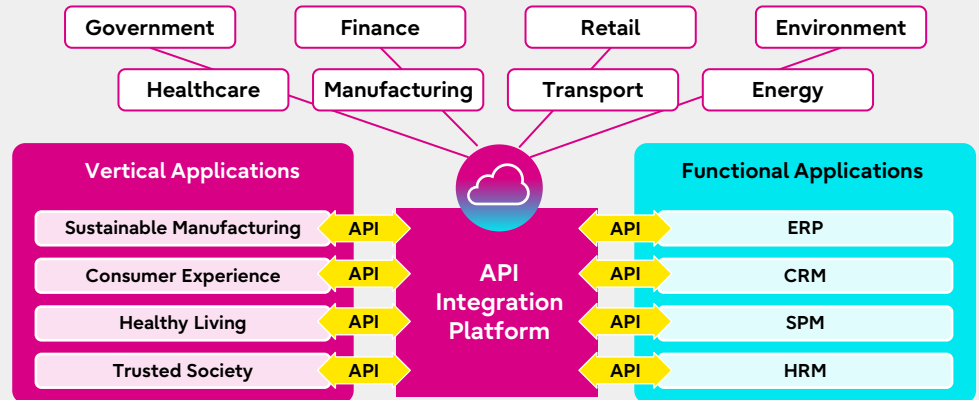
# Business Applications

## Enabling business agility

Organizations need to respond quickly to changing customer needs and markets as well as environmental and social conditions. In many cases, existing IT systems are unable to respond in a timely fashion. In addition, organizations are facing a shortage of the skills and talent to meet the growing need for agile development of digital applications. We believe that in the future businesses will shift from creating their own new cloud-native applications to quickly connecting and combining various services.

Fujitsu provides a wide range of business applications on a global basis, bringing together technologies from our ecosystem partners with our own deep industry knowledge and cutting-edge technologies. As a navigator supporting organizations with technology, we continue to develop applications and services that further enhance business agility.

- Use** > Combine and utilize global-standard services
- Connect** > Flexibly integrate industry applications and functional applications through APIs
- Combine** > Improve agility by integrating composable applications that incorporate knowhow of specific industries and AI technology utilization.





# Hybrid IT

Connecting the physical and digital worlds safely and securely

How can IT infrastructure help to realize a more sustainable future? By enabling various organizations and research institutes to easily utilize the computing power of HPC and high-speed 5G networks, we can accelerate innovation to overcome our most difficult environmental and social challenges. We must also create the required processes to protect safety and data security across a borderless world, with the resilience needed to respond autonomously to risks and failures.

Fujitsu is advancing Hybrid IT from simple cloud migration through to the convergence of physical and digital environments and the realization of a human-centric, connected world. By providing a safe and secure technology platform, we are connecting people, data, things and services across physical and digital spaces, contributing to the creation of new value and helping to address social challenges.

## HPC cloud and Network and Edge as a Service

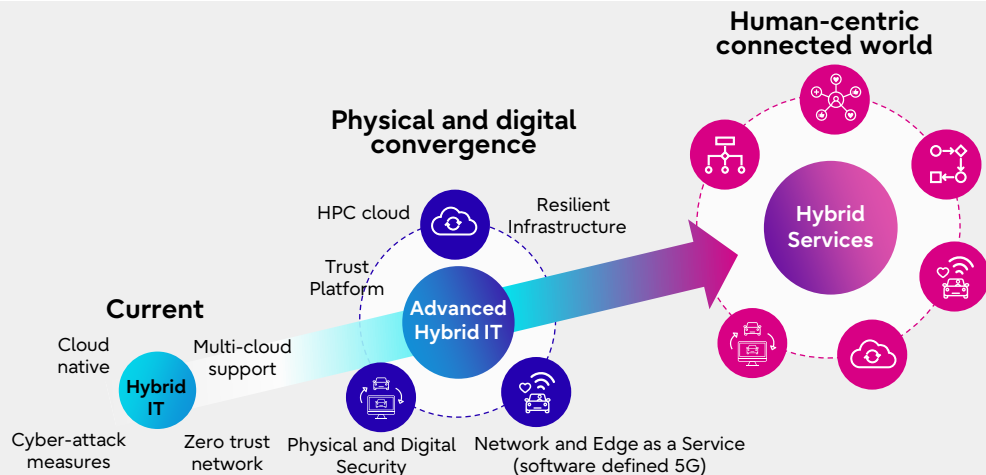
Provide HPC and networks as an 'easy to use anytime' infrastructure service.

## Security

Support physical-digital convergence with next-generation security, enabling the borderless world.

## Resilient service

Reduce the business risk caused by system outages by introducing proactive AI-driven detection of failures, root cause analysis, impact analysis and decision support.





# Business and social transformation through innovation

Fujitsu is deploying digital technology and services to drive sustainability transformation across multiple areas.



## AI quality assurance in manufacturing

SUBARU

Gunma Factory's Oizumi Plant is using an AI model to accurately determine the quality of grinding processes for the manufacture of camshafts, an engine component for valve control. Real-time inspection by AI is already reducing post-production problems.



## Strengthening customer touchpoints by OMO

United Super Markets Holdings (U.S.M.H.)

U.S.M.H. offers "Scan & Go and Online Delivery", a smartphone app for a smart online and offline shopping experience. U.S.M.H. and Fujitsu jointly drive agile development to continuously enhance application functionalities and to strengthen consumer touch points.



## New service utilizing clinical data

National Cancer Center Japan

The National Cancer Center Japan and Fujitsu are developing a new platform that uses anonymized electronic medical records and vital data safely. They are also collaborating to standardize electronic medical record information, enabling other medical institutions and pharmaceutical companies to use it globally.



## Maximizing distributed energy resources

AutoGrid

To fully use distributed energy sources such as renewable energy and storage batteries, Fujitsu is working to realize distributed power management to predict and optimize the status of a large number of distributed energy resources in real time based on globally renowned AutoGrid solution.

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