

A wide-angle, high-altitude aerial photograph of Earth from space. The image shows the curvature of the planet, with a bright sun on the right side creating a lens flare and illuminating the clouds. The sky transitions from a deep blue on the left to a bright yellow and white on the right. The clouds are dense and white, covering most of the visible surface.

Fujitsu
Technology and
Service Vision
2021



3 Scenarios for the future

Toward a better future

Fujitsu is keen to be your digital transformation partner, working with you to address the challenges facing business and society. By bringing together our integration capabilities and cutting-edge technologies, we can support your success and contribute to a more sustainable world.

How will business and society change over the next five to ten years? If we look back from the future, what strategies will we need in the next two to three years? And how can Fujitsu help you in this process?

In this module, we explore transformation scenarios across manufacturing, consumer experience, healthy living, trusted society, and business management.

Sustainable Manufacturing



Consumer Experience



Healthy Living



Trusted Society



Business Transformation



Sustainable Manufacturing

The future of manufacturing

Greener industry

Manufacturing is a very significant sector, accounting for 15% of global GDP^{*1}. In recent years, the environmental impact of manufacturing has become a major issue, accounting for 20% of CO₂ emissions^{*2} and creating significant waste through supply and demand mismatches.

On the other hand, global supply chains revealed vulnerabilities against unexpected turmoil caused by the pandemic and natural disasters.

What kind of transformation is required to minimize environmental impact? How can manufacturers gain the capability to effectively respond to changes under the extremely uncertain world? It is clear that entire ecosystems need to be rebuilt to embrace the principles of resilient, circular manufacturing.

1

Human
augmentation
by digital

2

Resilient
supply chain

3

Circular
manufacturing

*1 *2 World Bank





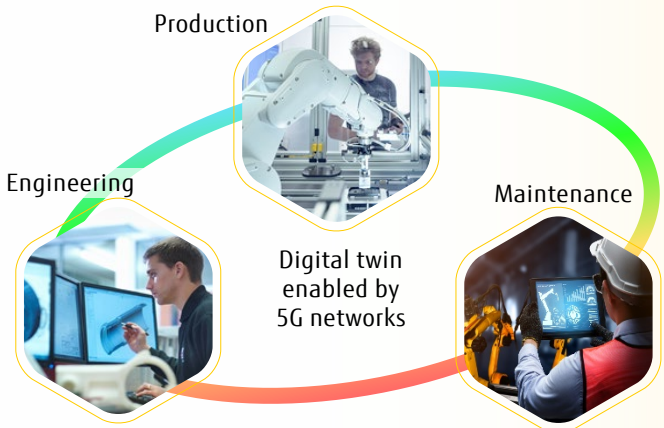
1

Sustainable Manufacturing

Human augmentation by digital

Digital technology will augment human capabilities. Bringing together people with a complementary digital workforce*1 will change the landscape of manufacturing, improving productivity as well as well-being.

Trusted AI technology will empower people, allowing them to work more creatively and productively in various processes of manufacturing. In addition, technology will enable effective remote collaboration and process management even during a pandemic, supporting borderless work and lives.



Fujitsu provides the COLMINA service platform for digital transformation in manufacturing. We help organizations build new processes, using digital technology to empower people across the entire scope of their operations.

Innovating production line

We are helping engineers to calculate the optimum positions of human workers and robots, assessing their movement in the digital space to evaluate and continuously improve actual workflows. Training in the digital space is also effective in responding to decrease of experienced workers in an aging society.

Integration of AI

Our AI-based solutions detect the early signals of abnormalities, enabling preventive maintenance to take place. AI is also widely deployed in quality inspection. For example, by using AI to detect defects in aircraft parts, GKN Aerospace has successfully created new levels of production and service efficiency.

Engineering in the digital space

By enabling engineers to use 3D digital mock-ups, we help them front-load their remote design reviews and therefore optimize production processes. High-speed low-latency 5G networks enable use of video and other data across the entire processes.

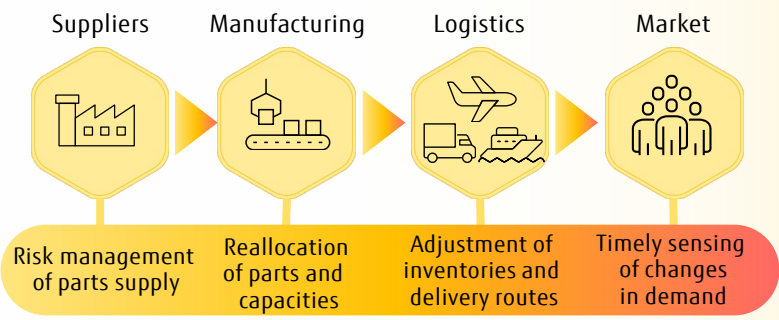


*1 Software robots driven by digital technology like AI

2 Sustainable Manufacturing Resilient supply chain

To grow in an uncertain world, it is imperative to drive the entire value chain of manufacturing using digital technologies, responding to unexpected changes with agility and flexibility.

It is key to sense changes in demand in the market and occurrences of disasters in supply chains in real time. By exploiting data and digital technology, organizations can dynamically manage modularized processes of supply, manufacturing and logistics, improving the anti-fragility of their operations.



Fujitsu helps organizations to visualize their operations across their entire value chains. We further support modularizing their processes, enabling dynamic management of operations and strengthening resilience.

Responding to demand volatility

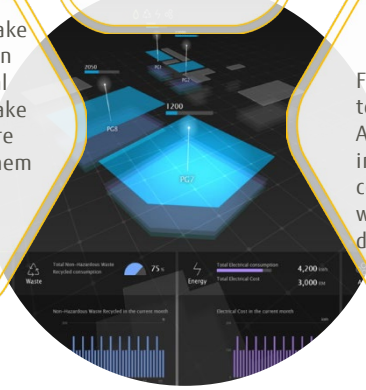
We help organizations to quickly and dynamically adjust procurement of parts and modular production processes, in response to change in demand.

Visualizing risks

We help organizations to make an immediate assessment on the likely impact of a natural disaster such as an earthquake or flooding across their entire supply chains. This allows them to quickly take counter-measures including use of alternative suppliers.

Optimizing manufacturing and logistics operations

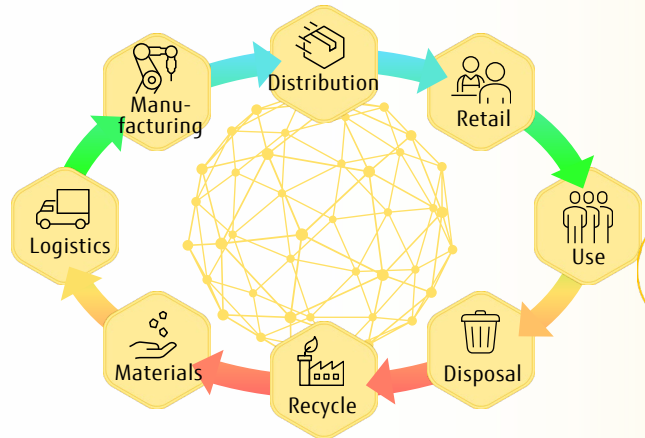
Fujitsu's quantum computing technology Digital Annealer and AI technology enable immediate optimization of complex production scheduling, warehouse operations as well as delivery routing.



3 Sustainable Manufacturing Circular manufacturing

By connecting end-to-end ecosystems, from production to consumption, reuse, disposal and recycling, we can transform manufacturing to protect the global environment.

Transparent traceability is essential to visualize where and how materials are made for products. In order to reduce food loss and waste, industrial waste and CO₂ emissions, all ecosystem players, from producers to consumers, need to collaborate using trusted data.



At Fujitsu, we implement a responsible, green approach to procurement and environmental management across our global operations. We are also pioneering design engineering techniques focused on environmental protection, while using digital technology such as blockchain to connect trusted data, helping to realize the potential of circular manufacturing.

Engineering for a greener world

We relentlessly pursue environmentally-conscious product development, focusing on material selection and end-to-end value chain planning to achieve the best possible recycling outcomes.

Green procurement

As a member of the global Responsible Business Alliance, Fujitsu promotes CSR procurement, together with our partners, and provides a range of green procurement solutions, including chemical substance management.

Traceability

Fujitsu helps organizations realize end-to-end traceability using blockchain technology. AB InBev, one of the world's largest brewers, is building a blockchain solution that links each part of the brewing process from barley farms to breweries, giving consumers transparency into what goes into making their beer. The project provides a full end-to-end view of the supply chain and it can also help to advance agricultural development by improving growers' yields, water, and energy efficiency, as well as soil health.



Consumer Experience

The future of customer experience

Centered on individuals

The global pandemic has significantly shifted people's buying behaviors toward digital. According to Fujitsu's recent survey, 72% of companies said their customers wanted online access, with 83% having recently strengthened their online services through mobile and the Web.

How will the customer experience change in this environment? From Fujitsu's survey, 78% of business leaders believe that the offline and online customer experiences will merge seamlessly. On the other hand, we cannot discount the value of physical experiences. 64% of online companies told us that there is unique premium value in face-to-face experiences, which are not possible online. And 79% expressed their intentions to pursue offline business, for example, through opening physical stores. Once separate entities, it is clear that the border between the physical and digital worlds is disappearing. The key for success is how we can deliver a converged customer experience, reflecting individual needs and preferences.

1

Physical and digital convergence

2

Meeting unexpressed needs

3

Ecosystems for people's lives





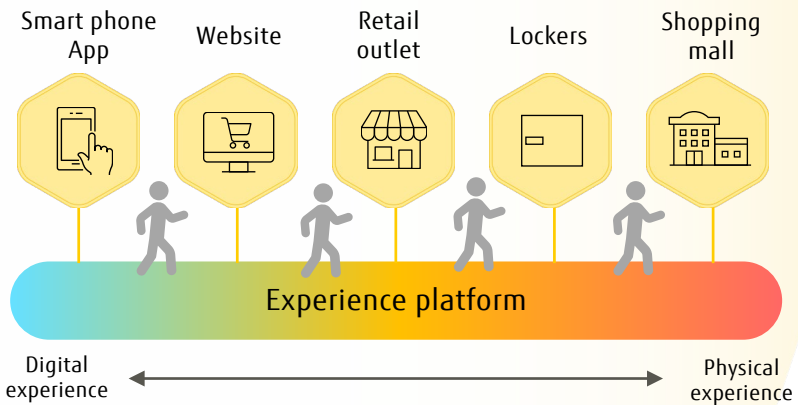
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Consumer Experience

Physical and digital convergence

In the modern world, customers are always connected to digital. It is essential to provide them with a borderless, human-centric experience that spans both the physical and digital spaces.

The online experience is merging with offline experience. For example, many people already order online and collect in-store, even using their smartphones to make purchases while inside a store. What will come next?



While digital is becoming a default mode, the importance of face-to-face communications is being re-evaluated. Fujitsu uses digital technologies to connect physical and digital customer touch points, helping businesses to transform their customer and employee experiences in a balanced way.

Improving employee experience

We also provide IoT, AI and robotics solutions to automate in-store operations, enabling staff to spend more of their time helping customers.

Innovating customer experience

We are already enabling converged physical and digital customer experiences; for example, creating unmanned store solutions using sensors and AI, as well as a walk-through checkout solutions using smartphones.

In Korea, Be Good Friends combines Fujitsu's PalmSecure authentication solution and AI technology to realize the vision of an unmanned convenience store.

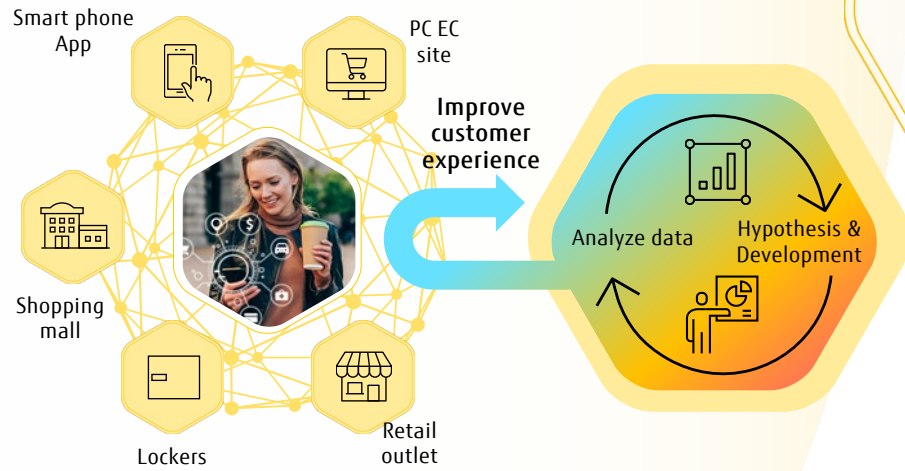




2 Consumer Experience Meeting unexpressed needs

By being always connected with customers, you are better placed to anticipate their potential needs and satisfy them.

It is becoming extremely important to predict what a customer might want at a certain place and time, instead of waiting for an expressed demand. Continuous analysis of individual behavioral data enables you to meet these unexpressed needs, helping you realize customer success.



A key feature of digital business is the ability to engage continuously with customers, using data to improve their experiences in an agile fashion. Fujitsu provides data analytics and video analysis solutions to find what customers might want to do.

Forecasting and automatic ordering

Fujitsu provides an AI-based automatic ordering solution that manages inventory and forecasts demand based on real-time data. This helps solve challenges like food loss and waste, through improving supply chains.



Customer behavior analysis

The behaviors and attributes of customers can be identified from real-time video images using Fujitsu's AI technology. We enable analysis of customer behaviors while also protecting individual privacy. AEON Retail, the largest retailer in Japan, uses our AI-based video analysis solution to detect store congestion and quickly identify customers who need assistance. This allows them to notify their staff accordingly, so that they can maintain safe and secure store operations and improve customer experiences. AEON Retail is already working on further areas of data-driven in-store transformation.

3 Consumer Experience Ecosystems for people's lives

Various services are being digitally integrated in other services, to support individuals in their daily lives.

The borders of existing industries are falling away. Increasingly, many services are being connected and delivered based on the needs of individual consumers. The development of new ways to connect services and exchange data between different sectors is accelerating. At the same time, self-sovereignty identity is becoming important to properly protect private data.



Fujitsu has deep experience and expertise in deploying technology across a wide range of sectors, from retail, distribution, finance and manufacturing through to public services and healthcare. By linking different sectors with digital technology and trusted data, we are helping to develop ecosystems that support individuals in their daily lives.

IDYX (IDentitY eXchange)

Fujitsu has pioneered a self-sovereignty distributed ID technology based on blockchain. JCB, Mizuho Bank and Fujitsu jointly conducted a proof of concept based on distributing digital IDs using IDYX. Our intention is to enable people to share their private data with confidence.

API economy

Fujitsu is also developing and deploying an innovative cloud-based Banking as a Service (BaaS) platform. By providing a rich set of APIs, this enables organizations across various sectors to easily integrate financial services into their products and services.

Multiple biometric authentication

Fujitsu provides a multi-biometric authentication solution that combines our PalmSecure vein authentication technology with facial recognition and other technologies. With this rapid, contactless solution, we are contributing directly to the creation of a safe and secure global digital society.

Healthy Living

The future of healthy living

Longer and healthier lives

The pandemic has reminded us of the importance of health. It is also important to remember that older and lower-income groups were affected more seriously. What should we do to allow everyone to live healthy, fulfilling lives?

It is forecast that, by 2050, one in six people in the world will be 65 years or older. The aging of Japanese population, for example, presents a specific challenge, as it is expected that one out of every 2.5 people will be 65 years or older by 2050, up from one out of every 3.5 people today.

It is a common global challenge that people will live longer and healthier lives. The combination of medical and personal health data with digital technologies will play an important role in improving the well-being of all people.

1

Personal
health

2

Life science
innovation

3

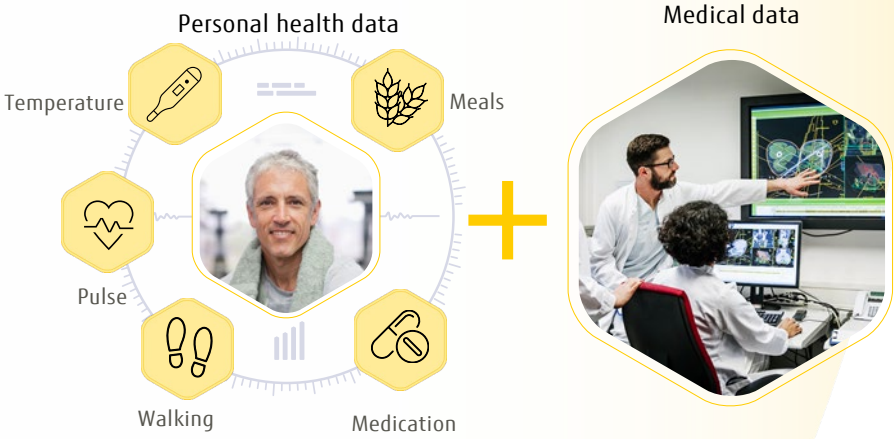
Smart health
ecosystem

1

Healthy Living Personal health

Healthcare will evolve into well-being services that not only treat medical conditions but also improve the health of individuals.

It is important to connect personal health data monitored through wearables and behavioral data like eating habits with medical records and genome information. By analyzing the combined data, we can prevent some medical conditions by improving lifestyles and providing more personalized treatment plans.



Fujitsu is supporting the development of personalized medicine and the improvement of individual health by connecting various data sources that are currently located separately. In this way, we contribute to achieving a society where everyone can live a healthy life.

Well-being

By linking medical data such as electronic medical records with health data held by companies that provide health-improvement services, Fujitsu is helping the development of new personalized treatment and well-being services.

Telemedicine

Fujitsu provides a safe and easy-to-use telemedicine solution to support healthcare, with particular relevance during the pandemic. This smartphone-based solution enables remote booking, video calls and payment, connecting with Electronic Medical Records in order to streamline hospital operations.





2

Healthy Living Life science innovation

The fusion of life science and computer science is creating significant innovation in drug discovery and medical treatment.

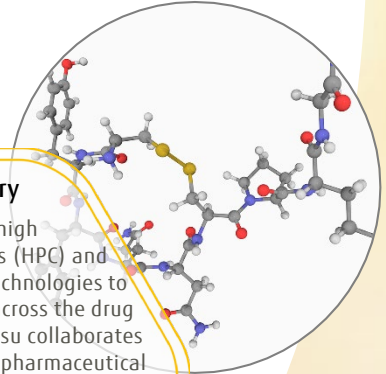
For example, the time-consuming drug discovery process can be shortened by deploying quantum computing technology and supercomputers to quickly process large amounts of data in the digital space. In addition, trusted AI technology will help analyze medical big data and genome data to find effective new treatments for intractable diseases, including cancer.



In addition to world-leading supercomputers and explainable AI technology, Fujitsu has developed innovative quantum computing technology – the Fujitsu Digital Annealer - that can solve combinatorial optimization problems instantly. We are applying all these technologies across the life science field, co-creating innovations for drug discovery and genomic medicine with research institutions and our enterprise partners.

AI technology
Our explainable AI technology is contributing to advancing genomic medicine for cancer. We have also developed an AI-based CT-scan image recognition solution with Tokyo Shinagawa Hospital, with the aim of supporting more rapid diagnosis of COVID-19.

Drug discovery
We are leveraging our high performance computers (HPC) and quantum computing technologies to help drive innovation across the drug discovery process. Fujitsu collaborates with PeptiDream, a biopharmaceutical provider, to innovate drug discovery processes using Fujitsu Digital Annealer and HPC. In addition, PeptiDream, Fujitsu, Mizuho Capital, Takenaka Corporation and Kishiida Chemical have established a joint venture to develop a new drug for COVID-19.

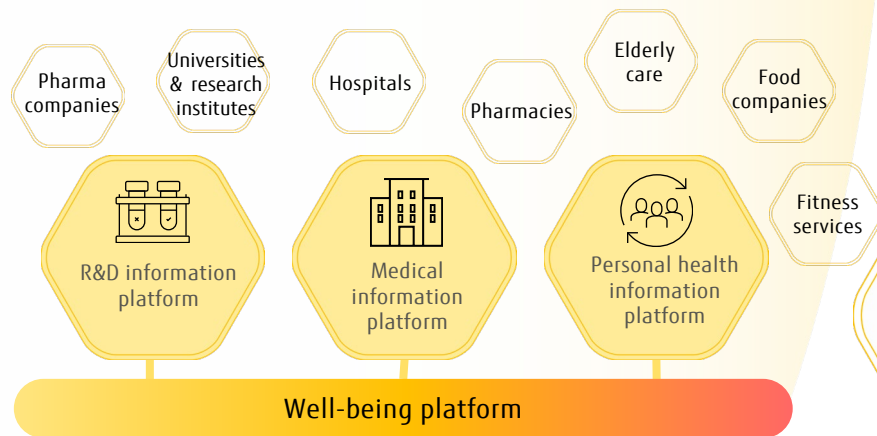


3

Healthy Living Smart health ecosystem

We continue to support innovation by creating mechanisms for organizations across different sectors to exchange medical and health data in a trusted way.

To accelerate innovation, we need to develop medical and health databases that can be used by universities, research institutions, pharmaceutical companies and start-ups. We believe various organizations will co-create innovative well-being services on highly secure and trusted data platforms.



Fujitsu has provided research and development information systems for pharmaceutical companies, in addition to delivering Electronic Medical Record systems and regional healthcare networks. We are also contributing to the creation of well-being platforms that connect information from pharmaceutical companies and medical institutions to the various agencies that support people's health.

Regional healthcare networks

In Japan, Fujitsu has helped build networks connecting over 7,000 hospitals, clinics, care facilities and pharmacies.

Co-creating well-being services

We are conducting joint research with National Cancer Center Japan to provide real-world data such as Electronic Medical Records data to pharmaceutical providers to facilitate the development of new drugs, clinical trials and preventive medicine. We aim to co-create new services contributing to personalized cancer treatments as well as preventive medicine.

Pharmaceutical systems

Fujitsu provides comprehensive IT solutions to support ongoing research and development into new drug treatments.

Trusted Society

The future of cities and society

Human-centric sustainable society

The world faces ever-increasing uncertainty and difficult challenges, from environmental issues through to aging populations. Facing these challenges, how can we realize more inclusive public services for everyone? What is needed to protect our cities from pandemics and frequent natural disasters? How can we enable people to live with peace of mind?

Cities are increasingly complex ecosystems in which many people live and work. Public and private organizations across a wide range of sectors are now creating value together. To sustain and grow cities, we need to share a clear purpose and goals and to co-create human-centric value together.

Digital technology is a key tool. In our global survey, 91% of business leaders told us that digital transformation has helped them to deliver value to society. They cite safety and security, the development of smart cities, and the improvement of well-being as key outcomes. To deliver digital transformation for society, we need to connect generated data and enable people and organizations to use this data safely.

1

Human-centric
public services

2

Resilient
society

3

Smart city
ecosystem



1

Trusted Society

Human-centric public services

To realize a society where no one is left behind, it is important to provide personalized public services that meet the needs of individuals.

The private data of citizens must be protected and connected across public-sector organizations via secured distributed networks. We also need to ensure that the private sector and citizens participate in co-creating inclusive public services based on achieving common goals.



Human-centric services, created from connecting data generated in many fields

Co-creation of public services with private companies and citizens

Fujitsu continues to support public services by developing IT solutions for governments and public service organizations across many countries. We are using data and digital technology to enable the ongoing transformation of public services, helping to realize human-centric public services.

Human-centric services

Digital is becoming a default mode. Fujitsu helps organizations to provide intuitive, easy-to-understand and inclusive public services that integrate both physical and digital experiences. We will help organizations to anticipate the needs of citizens, to provide key information, for example, through digital touchpoints such as smartphones, and to empower citizens to receive services digitally.

Data connection

We provide digital trust technology, helping to connect citizens' data across organizations while protecting privacy.

Co-creating services

Fujitsu uses design thinking to help organizations create their vision for the future, including the opportunity to co-create new public services through collaboration between citizens and both the public and private sectors.

2

Trusted Society Resilient society

The analysis of real-time data enables us to predict what may happen in the future. This helps to mitigate the impact of natural disasters and pandemics as well as to address environmental challenges.

It will become possible to project the dynamics of society into a digital twin by processing real-time data from multiple sensors on an ultra-high-speed, large-capacity computing infrastructure. This digital twin will enable us to predict risks and allow people to live safer and more secure lives.



Fujitsu delivers trusted solutions using cutting-edge technologies including computing, AI and digital twins, contributing to the creation of a more resilient society.

Disaster prevention

Fujitsu helps local governments to prevent and mitigate flood damage. We provide an AI-based solution to forecast the water level of rivers for six hours ahead, based on the past rainfall data, the current water level and the rainfall forecast.

Supercomputers helping solve societal challenges

Fugaku, a supercomputer jointly developed by RIKEN and Fujitsu, became fully available for use by various organizations in March 2021. Fugaku has already helped deliver significant outcomes, for example, in the research of tsunami simulation and responses to COVID-19.

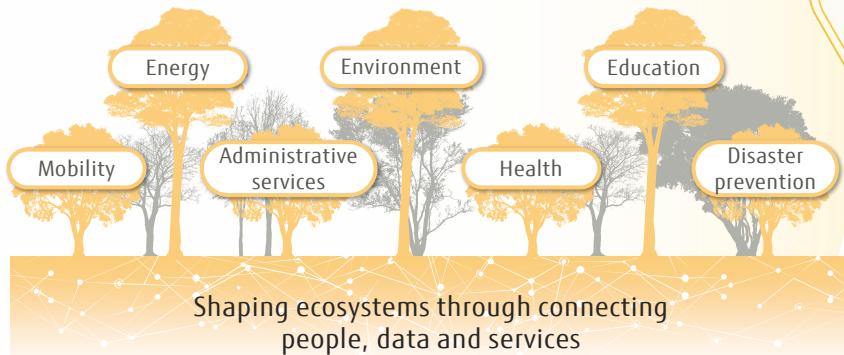
Urban mobility

We help to optimize logistics and address environmental challenges by using our AI, 5G, digital twin and quantum computing technologies. For example, the City of Montreal in Canada has used our AI technology to control their traffic lights dynamically, helping to reduce traffic-related issues. The City of Dublin in Ohio, USA, has also conducted a successful smart parking project, combining 5G with AI-based video recognition technology.

3 Trusted Society Smart city ecosystem

In order to realize a trusted smart society, we need new regulatory systems that ensure the flow of trusted data as well as a new enabling technology architecture.

By connecting data generated across different domains, from administration and mobility to energy and health, we can help to enable sustainable city ecosystems. We need distributed data platforms that governments, public institutions, companies and citizens can use with confidence.



Fujitsu contributes to the development of trusted data flows and smart city operating systems, essential to underpin the provision of human-centric public services. In addition, we are collaborating with partners across a range of projects to create future cities, including Japan's Super City initiative.

Digital trust

Fujitsu has developed a Trust as a Service (TaaS) technology that ensures the authenticity of data. We are now collaborating with partners to implement this technology.

Energy

Fujitsu is promoting distributed Virtual Power Plants (VPP) to expand the use of renewable energy and realize a decarbonized society.

Environment

Proventia is using Fujitsu's IoT technology to provide a solution that collects and analyzes real-time data on vehicles' CO₂ emissions. The solution is already in use with a public bus network in London.

Future City

In Osaki-Kamijima Town, Hiroshima Prefecture, Fujitsu conducted a proof of concept to develop a new transportation and distribution infrastructure for isolated islands. The project, which uses on-demand transportation technology and self-driving vehicles, aims to support elderly residents who have difficulty in driving.

Business Transformation

The future of management

B2E (Business to Everyone)

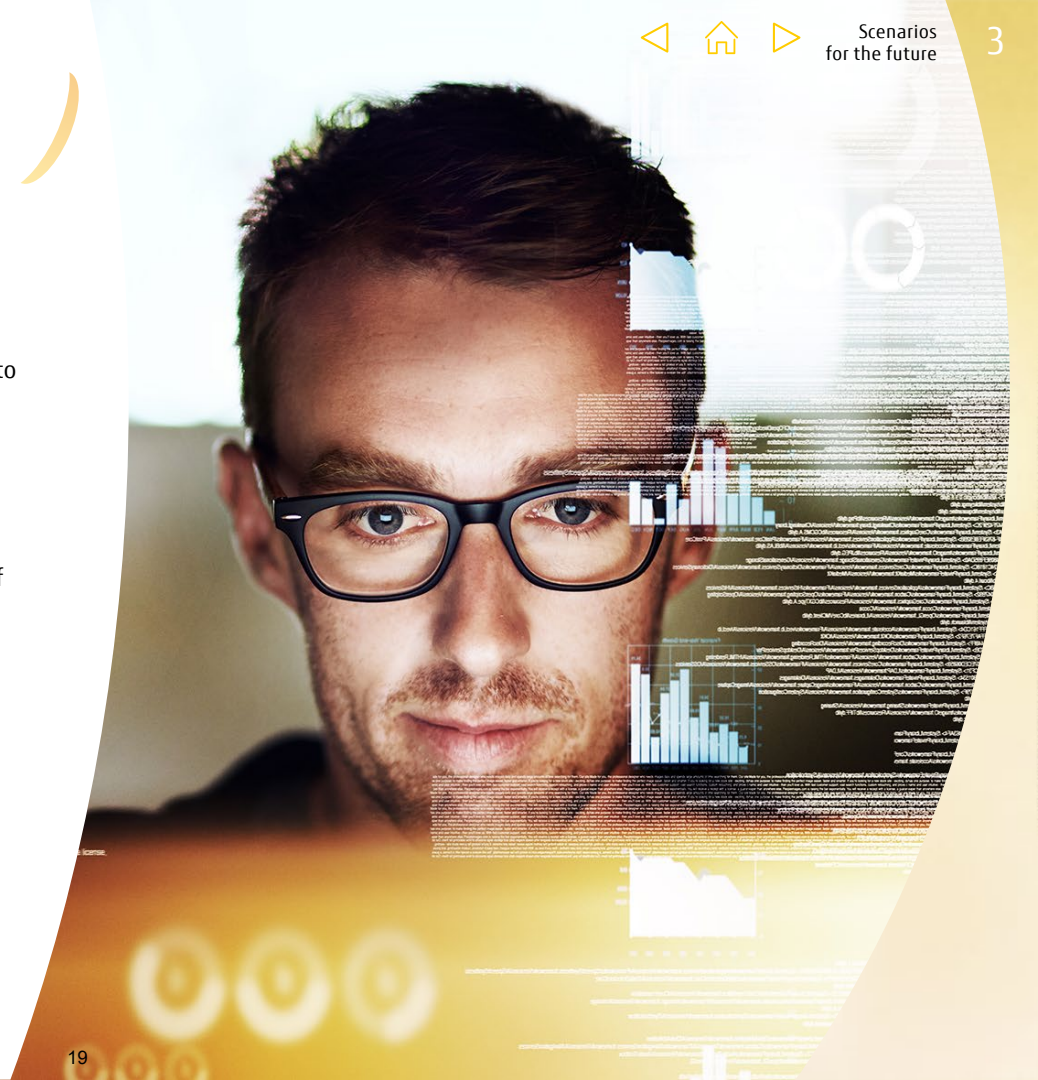
Passing the inflection point, also known as the Great Reset, business management is now undergoing dramatic change. In this context, we need to strengthen resilience, adapting to this uncertain environment with agility. We also need to deliver value to everyone, to all our various stakeholders.

Fujitsu's global survey reveals that 83% of organizations are working on digital transformation, with 39% already having delivered business results. Digital transformation is not just about introducing digital technology, it is about transforming business. How can you enhance value to wider groups of stakeholders, such as employee well-being? How can you ensure business continuity, adapting to unexpected changes in a crisis? In addition, how can you embrace an increasingly borderless society, connecting internal and external ecosystems while protecting data privacy and security?

1
Digital Shifts

2
Business Applications

3
Hybrid IT





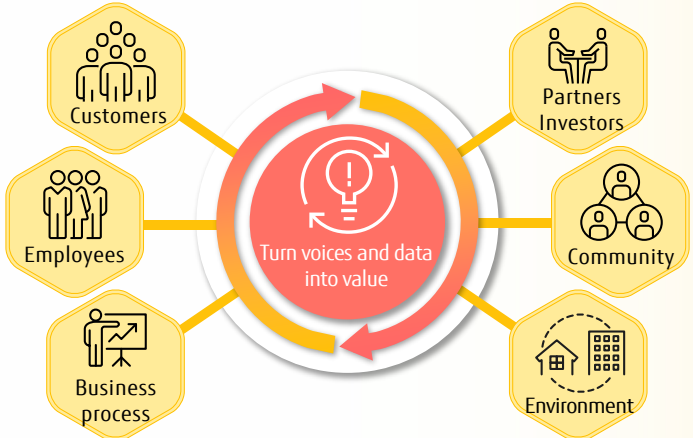
1

Business Transformation

Digital Shifts – shifting to a digital business

In this fast-changing world, there is a growing acceptance of the need to help people maximize their individual potential, using data to continuously improve value for all stakeholders.

For example, improving the well-being of employees is essential to help them unleash their creativity. Organizations need to collect and understand the feedback from their stakeholders, using data generated from business processes to gain insights in real-time.



Fujitsu is embracing data-driven management, using the voices of our customers and employees. We also integrate and analyze a wide range of data generated across operations to create insights. We are using these voices and insights to transform how we work (Work Life Shift) as well as to enable fast decision making. Using the experience gained through our own transformation, we are now helping many customer organizations transform their businesses.

Work Life Shift

Fujitsu has listened to the voices of our people who support the work from home model, and have subsequently introduced our global Work Life Shift program. We aim to enhance the well-being of all our employees both in their work and private lives. This program enables flexible working styles and drives the underlying culture change. We are also providing Work Life Shift solutions to help our customers.

VOICE

We continuously collect voices from customers and employees, helping us identify issues and take actions to achieve the success of stakeholders. We aim to allow all employees to proactively participate in the decision-making process.

Value from data

Combining large-scale data platform technologies, Fujitsu helps organizations to analyze a wide range of their internal and external data. Using our own experience, from business management to spare parts optimization, we help them become data-driven businesses.

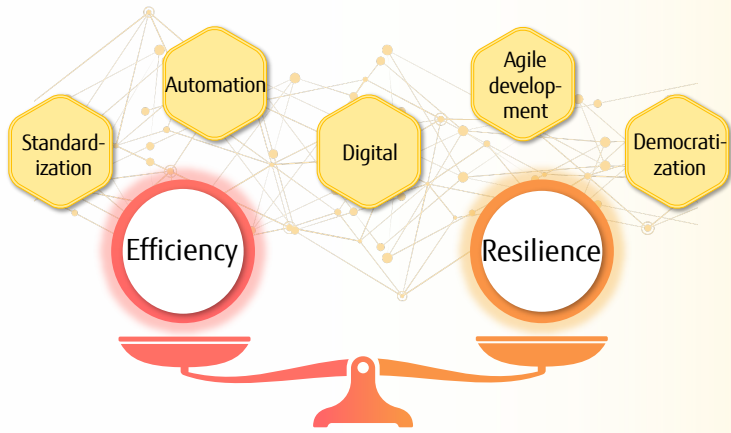


2

Business Transformation Business Applications – achieving efficiency and resilience

In this uncertain world, we all need to adapt to unexpected changes flexibly, while maintaining our business efficiency. By strengthening resilience, we can help our businesses survive, even at times of unexpected crisis.

This requires focus on users, when developing and operating applications across both on-premise systems and the cloud. You need a technology partner that can drive efficiency and resilience through business process automation, digitalization and agile development.



Over 40,000 people across Fujitsu’s Global Service organization collaborate as one organic team to enable agile development that is essential for digital innovation as well as to deliver standardized services to achieve efficiency. As your trusted partner, they work together to support your business.

Strategic partners

We collaborate with our global strategic partners, including Microsoft, SAP, ServiceNow, Salesforce and others, to deliver services to our customers.

Global Services

Fujitsu’s regional delivery organizations, near-shore organizations like Japan Global Gateway and Global Delivery Centers located in 8 countries collaborate as one team. They pursue enhancement and standardization of key service offerings, ensuring trusted delivery across all regions in the world.

Cloud integration

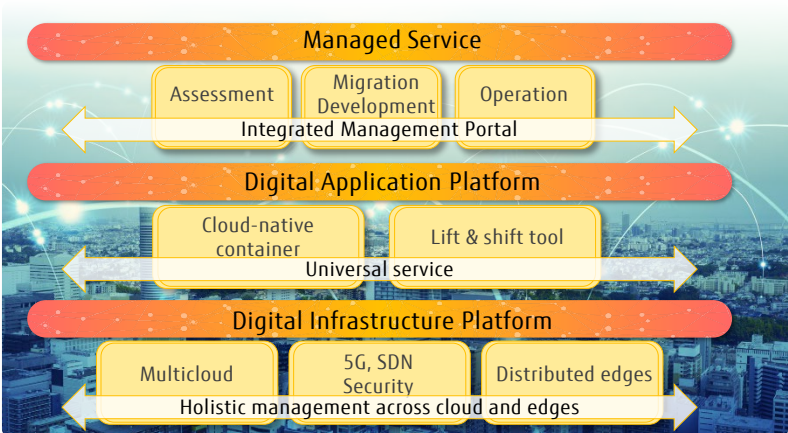
Fujitsu uses the latest technologies to enable agile development of both front-end systems and large-scale complex mission critical systems. In addition, we will provide development frameworks and platform to support organizations with their own applications development activities.

3

Business Transformation Hybrid IT – enabling borderless lives

We need to build digital infrastructures that connect people, data and services, helping deliver new value, while protecting security in an increasingly borderless society.

It is important to develop not only hybrid IT infrastructures that can process data both in the multi-cloud environment and at on-premise data centers in a trusted, distributed way, but also digital application platforms and integrated management portals for managed services.



Fujitsu provides Hybrid IT that integrates multicloud infrastructure with digital application development platform. We also provide managed security services for multi-cloud security and borderless work and lives to help realize customers’ digital transformation. We will continue to advance predictive and preventive automation based on AI and other technologies, to deliver resilient infrastructure services for business and society.

Hybrid IT

Fujitsu provides digital infrastructures that seamlessly connect multi-cloud and on-premise data centers. We are also strengthening agile digital application platform and managed services encompassing from assessment to operations. We also explore to augment edge processing with high-speed low-latency 5G networks.

Security

Fujitsu provides security solutions and managed services to ensure security by design and protect multi-cloud environments. In addition, we help organizations to adopt a hybrid workstyle with confidence, based on the concept of zero trust.

FUJITSU LIMITED

Shiodome City Center,
1-5-2 Higashi-Shimbashi
Minato-ku, Tokyo 105-7123, JAPAN
Tel. +81-3-6252-2220
<https://www.fujitsu.com/global/>

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