FUJITSU

Fujitsu Technology and Service Vision

2015

shaping tomorrow with you

Message from the President

Digital technologies, like the internet and the smartphone, are advancing fast. They have become indispensable to business and our everyday lives. It is not only people but now things, information, processes are increasingly connected to networks, creating new value. It is important for enterprises to harness digital technologies to create innovation and produce competitive advantage.

Digital technology continues to grow, permeating every facet of today's world. In such a climate, the competitiveness of businesses are all linked and, more than ever, businesses have the opportunity to generate positive outcomes for society as a whole. We must consider creating social value and corporate growth as one and the same goal.
A mounting number of issues threaten the sustainability of our society. Inadequacy of food and energy, urbanization, natural disasters, economic inequality– these are all global issues. We believe that digital technology is essential to solve these issues.

There are some concerns that the further progress of technology might cause some disadvantages for people - like losing jobs. But we believe that real nature of technology is a natural extension of human beings, making life better for everybody. We call this 'Human Centric'. We want to be the company that helps make this happen.

With this belief, the Fujitsu Technology and Service Vision sets out our thinking on how ICT is transforming business and society. We illustrate how Human Centric Innovation is creating new value, sharing stories from our customers.

We hope that you will take the time to read this booklet and consider partnering with Fujitsu, to help you innovate and grow.

July 2015

Fujitsu Limited
President and Representative Director
Tatsuya Tanaka

Introduction

This booklet sets out our thinking on how Information and Communication Technology (ICT) is transforming business and society. To achieve our vision of a Human Centric Intelligent Society, we set out innovation scenarios highlighting new ways of creating value, and show how technologies and services contribute to them. These technologies and services are embodied in our lineup of offerings.

Our approach is firmly based on the Fujitsu Way, our corporate philosophy and code of conduct. To deliver values for our customers and across society, Fujitsu will strengthen research and development as well as our global resources in line with this.

The Fujitsu Technology and Service Vision is an annual publication. This year, we expand on the examples of Human Centric Innovation which we put forward last year, and look at the progress we have made. We also feature innovation stories and our portfolio in a separate booklet. We hope it will be useful for your reference.

Contents and Summary

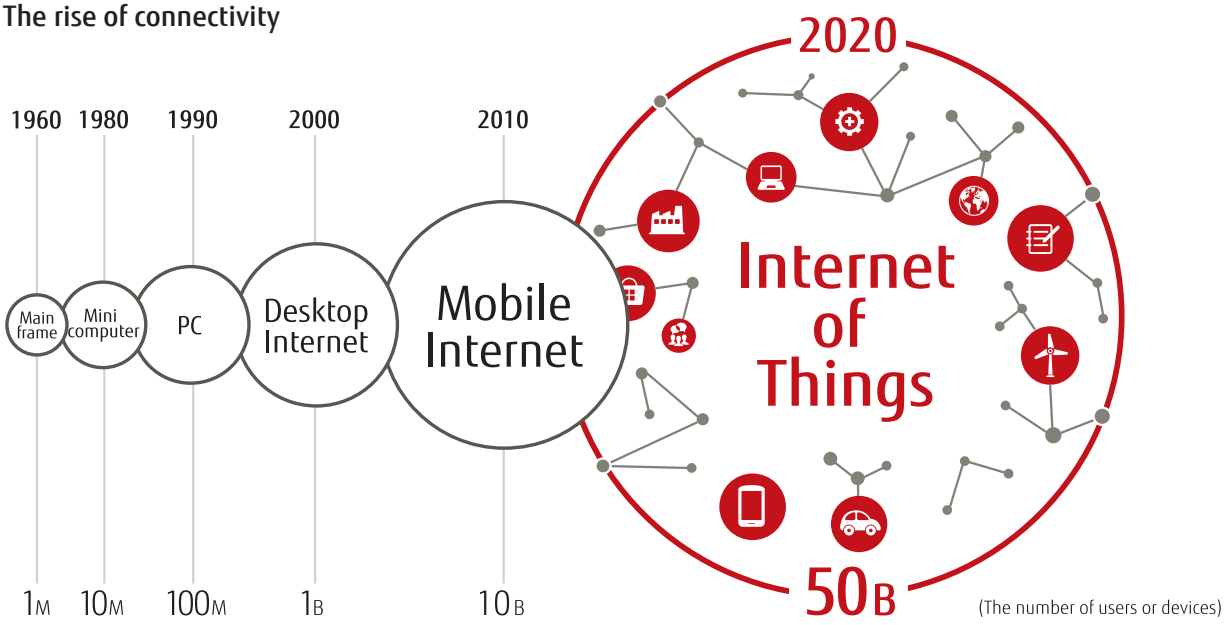
Chapter 1

People creating the future

Human Centric Intelligent Society

This is an era of challengers. Anybody can innovate. Human centric technology empowers people, maximizing our experience. It helps us cope with difficult challenges and build a sustainable society.

The rise of connectivity



The Value of Connections

The world is becoming more connected.

The flows of goods, services and finance make an ever greater share of global GDP. Global trade surpassed $26 trillion in 2012 - equivalent to 36 % of the global GDP - and is expected to grow to $85 trillion by 2025.*1

Air passenger traffic has risen ten times in the last 40 years, roughly doubling every 15 years.*2 Each year nearly 4 million people – the equivalent of a city the size of Rome – migrate and begin lives in different countries.*3 Cell phones have become globally ubiquitous. In 2015 the number of mobile subscriptions is set to overtake the global population.

It is not just that we are becoming more globally connected. We are experiencing a multi-layering of connectivity. Connections forming between people, businesses, information and processes, regardless of where they are. Today, communities are no longer defined only by location, but by common interests, lifestyles or professions. We are becoming a hyperconnected world.

ICT has been the driving force of hyperconnectivity. Cross-border internet traffic increased 18 times between 2005 and 2012.*1 In 2014 some 1.3 billion smartphones were shipped around the world and soon these will be ubiquitous just like cell phones. When tablets, game consoles, and other electronic devices are included, the mobile internet numbers some 10 billion devices.*4

But now, even the everyday things around us can be connected to the internet. The average cost of sensors has halved since 2004 and is expected to halve again by 2020. Sensors can be embedded in virtually anything, from cars, home appliances, to industrial machines, roads and bridges.

In 2014, 90 million wearable devices were shipped globally, up from 54 million in 2013.*5 Wearable technology – for instance a smartwatch or even a pair of smart shoes - can record anything from your heartbeat to how many steps you have taken or stairs you have climbed. These devices are delivering new insights which can help improve our health and fitness.

*1 McKinsey "Global flows in a digital age", 2014 *2 Airbus, "Flying on Demand Global Market forecast", 2014
*3 OECD "International Migration Outlook 2014", 2014 *4 CISCO "Embracing the Internet of Everything To Capture Your Share of $14.4 Trillion", 2013
*5 ABI Research World Market Forecast: 2013 to 2019

The number of things connected to the Internet will likely reach 50 billion in 2020, and probably more.*4 This next generation of the Internet - called the Internet of Things ('IoT') - is growing fast.

Yet it is not the volume of connectable things and devices that is significant, but the number of new ways they can be connected. The shift from mobile internet to the IoT is an order of magnitude change, just as the mobile internet has been from the desktop PC. And with such growth in the number and variety of devices, the number of new ways to make connections is unlimited.

Connections produce data. We are surrounded by a sea of data, so-called "big data". IDC forecasted that 44 zettabytes of data would be generated in 2020, a ten-fold increase on 2013.*6 We now have the capability to sense and predict, even in the most intricate industrial machinery, enabling a component to be replaced before it actually breaks down.

The hyperconnected era will change how we create business and social value. The combination of the IoT and big data will enable new ways of creating value. They bring the potential for a huge positive impact to the wellbeing of people and the global economy.

These changes are creating a new role for technology. ICT is no longer merely a business or personal productivity tool. With the power of digital information, ICT enhances an individual's experience and creates business and social value. When today we talk about digital technology, we mean ICT that is embedded into products, services, processes, social infrastructure, or even our everyday lives. It means ICT that is homogenous with and indistinguishable from product, service, process or infrastructure.

Digital Transformation

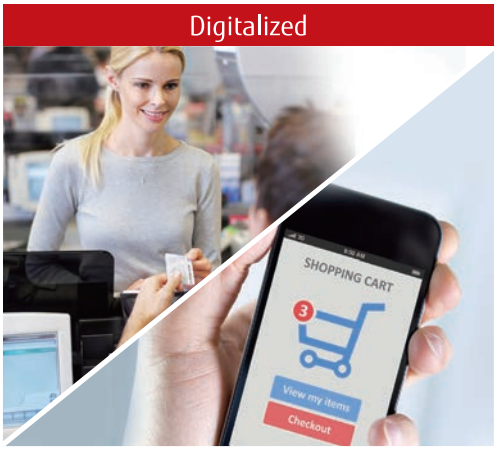
In the 1990s, the first generation of the Internet opened a new digital space, allowing people an exciting opportunity to exchange emails, browse the World Wide Web and benefit from e-commerce. A decade later, digital companies like Google and Facebook showed how technology could enable new and different business models.

Digital companies don't require big workforces, or substantial physical assets other than access to

A Hyperconnected World

*6 IDC "DIGITAL UNIVERSE of OPPORTUNITIES", 2014

Digital Transformation



data centers. They provide digital platforms that scale at a tremendous speed. Twitter, for instance, created by just a handful of people has grown into a service that has – quite literally - changed the world. Skype, from similarly modest beginnings, now handles more than one third of the world's international calls.

So, digital businesses benefit from the non-linear effects of digital scale. They can grow their number of users without big cost outlays for resources like people and production facilities. Digital companies serve rapidly growing markets with near-zero marginal costs. But physical businesses, which have many employees and assets, make up most of the world economy. They cannot operate in exactly the same way. However, they have a tremendous opportunity to benefit from these same efficiencies that digital technologies bring. They can create new experiences and value propositions for their customers.

For example, automotive companies can offer network connected cars which provide their customers with a completely different driving experience. From entertainment and navigation services, to integration with other services like insurance and servicing, to even accident prevention and automatic driving technologies. Retailers, meanwhile, are working to engage with their customers seamlessly through their shops and digital channels, maximizing the physical shopping experience with digital technology.

We call this digitalization. This is the process of applying digital technologies to products, services or end-to-end business to enhance customer value and achieve growth. 'Industry 4.0', a strategic initiative led by the German manufacturing industry, academics and government, is an example of this. They aim at digitalizing end-to-end processes, to design, manufacture and deliver a wide variation of products suiting individual needs at low cost and with greater agility. Connected factories will be a game-changer for manufacturing organizations.

Digitalization enables organizations to act faster in delivering customer value. This is not limited to making the cycle of design to production to delivery much shorter. The digitalized business has greater real-time visibility of its end-to-end operations, enabling a quick decision to optimize them and maximize customer benefits.

Digitalized businesses are also highly flexible. As Marc Andreessen*7 observed "Software is eating the world" and today many things are now con-

*7 Marc Andreessen is an American entrepreneur and software engineer who created web browser 'Mosaic' and 'Netscape Navigator'

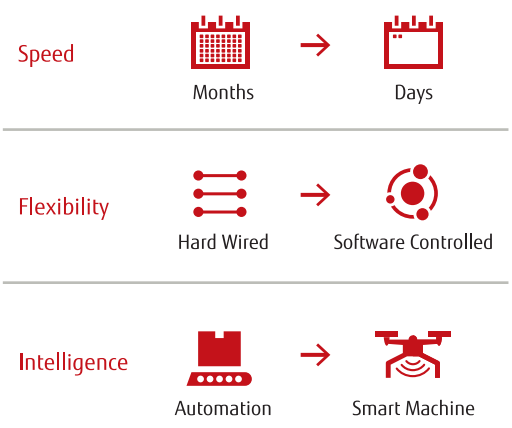
trolled by software. Modern aircraft, for instance, 'fly by wire', their physical control systems have been replaced by electronic ones. Likewise, digitalized business uses computer systems to control its core business processes. For example, rule engines that can alter pricing schemes on the fly, or smart grid infrastructure responding to fluctuations in demand. As more and more things, products and services are digitalized, software is increasing its share and importance across the entire industry.

Furthermore, digitalized businesses generate intelligence in a new way. Computers help us draw insights and make predictions by collecting large amounts of data, analyzing it to draw insights and make predictions. Computers are becoming capable of learning. They can recognize more and more patterns - images, naturally written and spoken language, helping people to make judgments. Many types of smart machines, including drones and robots, are going to support human activities. It means that we are now in a new era, where people are creating value using computers and smart machines in a different way.

Opportunities and Threats

The impacts of digital transformation go wider still. The cost of innovation, and the cost of starting up a new business have fallen sharply. Innovation is no longer the preserve of R&D departments with huge budgets. Digital technology gives people much more power than ever. They can gain access to information through the web and social networking. Similarly, people can access, inexpensively and easily, a wide range of technologies from cloud and mobile to open source software and 3D printers. This is an era for challengers. With a good idea and a good intention, anybody can innovate.

Impacts of digitalization



But digitalization also has a dark side. Delivering security is a growing challenge. The number of reported incidents grew by 48% in 2014 to nearly 43 million, and has seen a compound annual growth rate of 66% since 2009.*[8] In a world where information flows so freely, we can no longer take privacy for granted. We have to make a conscious effort to protect people.

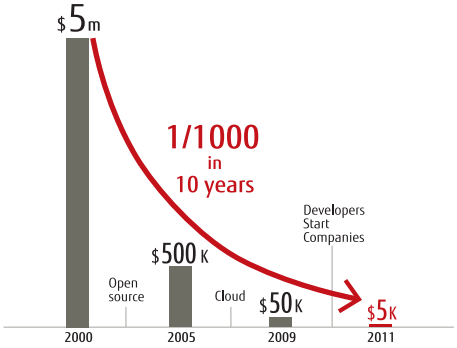
There is also a risk that technology itself can be alienating. With artificial intelligence and smart machines becoming more widely used, we must ensure that people are not excluded but empowered to live and work better and more creatively. If technology is not helping people and improving their lives, it is self-defeating.

The world is becoming truly borderless. The boundaries between different geographies, industries, enterprises and individuals, or hardware and software are fading away and becoming less meaningful. The emergence of a hyper-connected world is changing the rules of the game.

Many companies have already built a strong technology foundation. They have implemented processes and systems that optimize routine tasks. They have invested in e-business, mobile and other channels to interact with their customers. But in this new era, investment in technology in the normal way will not guarantee an organization to grow. Incremental gains, perhaps, but

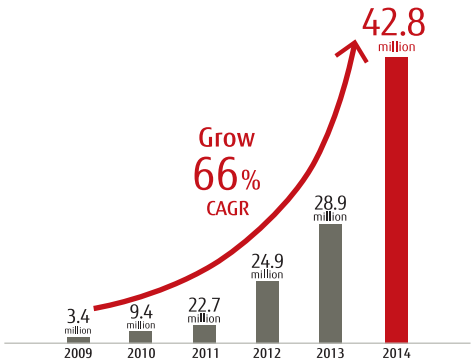
*8 PWC "Global State of Information Security Survey", 2015

The average cost of starting a business



Source: Key Note Speech,VCJ Venture Alpha Conference,Mark Suster (Partner, GRP)
"The State of the Venture Capital Markets" OCTOBER 20, 2011

Reported security incidents



Source : PWC "Global State of Information Security Survey", 2015

not growth. The way that companies used to use technology is insufficient to meet the challenge of a hyperconnected world. So organizations need to disrupt themselves, to break from the past.

For example, is a consumer products company ready to get growth by connecting its products? Will an industrial company be the first to gain market share in the lucrative maintenance business because it can connect to the millions of machines that are coming online?

Will an enterprise be ready to form new partnerships and compete outside of its traditional heartland? Convergence of retail business, retail banking and other businesses to provide better consumer service is already happening. Digitalization accelerates formation of cross-industrial business.

Organizations that fail to take action may end up facing disruption from others. In the UK in 2014, twenty-nine new organizations applied to the UK regulator for banking licenses, in an industry that has in the past been all but impenetrable for new entrants. The barrier for entry across all industries is dropping, driven by start-up companies that can use technology to exploit a digital business model.

But this is not something that will happen on its own. Organizations need to make a deliberate change to a new approach. So what is the key to creating a successful business and a sustainable society in a hyperconnected world? The answer may surprise you.

A New Paradigm

People. To produce value in a hyperconnected world, enterprises must put people at the center of all these new digital technologies.

Why? In a hyperconnected world, a digitalized business creates value from connections rather than assets. We believe this simple fact is driving a new business and economic paradigm, oriented around people.

If we look back, before the industrial age, society relied on creativity. Craftspeople used their skills to make the things people needed. Products were specialized and made to order. But this was limited by people's time and resources, and did not scale. The pace of innovation was slow.

In the industrial era, competitive advantage came from owning the factors of production - technology, plant and machinery, labor and financial capital. Standardized products were

produced cheaply and at large scale. So consumer value increased because many things were now affordable to ordinary people. In this asset-centric environment, human creativity was diminished. People became part of the entire business process.

In a hyperconnected world, we have the opportunity to combine the benefits of craftsmanship and industrialization. With digital technology, we can harness people's creativity to make tailored, specialized products, but in ways that deliver value at scale and at low cost.

At the one end of any business, it is people who innovate and create new value for customers. At the other end, it is people to whom any business delivers value.

Human Centric Intelligent Society

At Fujitsu, we believe technology exists to amplify people's intentions and help achieve their goals. For the whole of human history, tools and technology have empowered people, improving their quality of life, economy and society. From stone tools in the pre-civilized age, to printing presses in the renaissance, and industrial machinery and energy in the modern age.

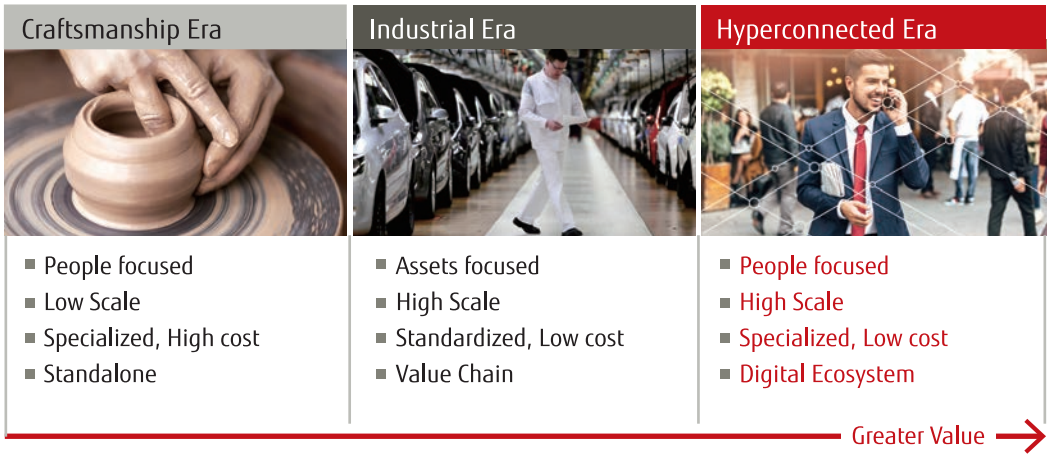
The most critical mission of technology, therefore, is to empower people. This is about how people use technology to collaborate and create knowledge. It is about how a business communicates and engages with its customers and partners. It is not just about process automation or being 'smarter', an approach likely to end with a hollow organization or society.

Today the average life expectancy of people has become much longer. Soon, living to over 100 will become the norm in developed countries, and scenarios for such a future society are being investigated. But will people be happy?

Human centric technology is a natural extension of human beings. It empowers people and improves their experience. It is an organic and connected style of technology, oriented towards a person's individual needs or preferences. It can understand people's needs and intentions and offer help. It has the potential to deliver greater benefits for all people.

When people are young, human centric technology will help them learn and develop. When they are grown up, it will help them work, create and cope with challenges. When they get old, it will help them sustain the quality of life with ad-

Paradigm Shift



A better experience, for everyone

vanced medicine, physical and memory support. Traditionally, IT systems have been constructed in independent silos. They are asset centric. People have had to learn how to use specific technology and adapt to it. But now, human centric systems are beginning to emerge. These systems are highly connected, with open digital interfaces which enable digital ecosystems to form. And these ecosystems have the power to deliver shared value on a wide scale – the wellbeing of people, urban mobility, safer food, education, sustainable energy, better environment, and disaster-resilient social systems.

Fujitsu's vision is a safer, more prosperous and sustainable world. We call this a Human Centric Intelligent Society. Empowered with technology, people will have the potential to overcome global challenges and build a better society together.

Our vision flows from connections. People are connected and empowered by greater access to knowledge. Systems are connected, enabling digital ecosystems to form and deliver greater value for people.

Fujitsu is focusing all our resources on realizing this goal, together with our customers and partners. Activities are happening in many places in the world. How will we achieve it? In the next chapter, we set out a roadmap to this vision and look at how enterprises can create innovation for growth.

Chapter 2

Roadmap to the future

Human Centric Innovation in Action

Innovation is a vital tool to achieve business and social growth. In this new era, value is created from connectivity. But fulfilling this means putting people at the center of everything. This is how we will enable digital ecosystems to form and create value on a wider scale.

©AIRBUS S.A.S. 2014 photo by MasterFilms H. Goussé

Delivering Growth and Shared Value

Building and servicing modern passenger aircraft is a complex and challenging business. Airbus S.A.S. has geographically dispersed production lines. Their A380, for instance, has sub-assemblies – nose, fuselage, wings, tailplane – that are made in factories in France, Germany, Spain and the UK. Furthermore, aircraft parts have life cycles that can run into decades, from design and manufacturing through to repair and disposal.

But the challenges are getting harder all the time. In 2012, Airbus was tracing 1.2 million parts every year. By 2017 they expect this number will more than double. In order to address these challenges, Airbus began to digitalize their operations. They decided to use radio-frequency identification (RFID) technology across the full lifecycle of their operations. Airbus selected Fujitsu as a supplier for a 'RFID Integrated Label' as well as a RFID data encoding and printing solution. The use of RFID technology has enabled Airbus to manage and track components throughout the production lines. By identifying the status of all types of parts at various storage locations, they can fine tune their inventory control, leading to shorter lead times, elimination of duplication in procurement and reduction of supply chain inventory costs.

This initiative has put people at the center of Airbus's business. Managers can focus on making decisions that matter to the business, using information they now have at their fingertips. Airline staff can make key equipment checks in minutes instead of hours. Ultimately, the aircraft spend more time in the air and less on the ground, which means more benefit to customers. By digitalizing their operations Airbus has built a platform to secure the future growth of their business. Instead of being hampered by complexity, they have turned it into a competitive advantage.

Today, growth is the number one concern of CEOs. And according to Gartner, the number of CEOs reporting this is increasing.*9 CEOs today already understand the importance of embracing digital transformation. But as we have seen in the previous chapter, the nature of business is changing in the hyperconnected era. Traditional resources, like in-house R&D or production assets, are no longer a guarantee of growth.

In a hyperconnected world, the competitiveness of a business and the communities around it are mutually dependent. Lynda Gratton*10 has written about businesses anchoring in the community

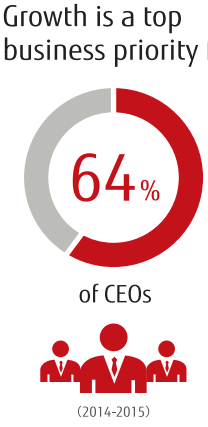


Chart created by Fujitsu based on Gartner research*9

*9 Gartner "The 2014 Gartner CEO and Senior Executive Survey: 'Risk-On' Attitudes Will Accelerate Digital Business" Mark Raskino, 09 April 2014
Note: There were 410 business leaders surveyed: 55% were CEOs, 23% were CFOs, 8% were COOs and 14% were others (chairman, president, boards of directors or other C-level executives).

*10 Lynda Gratton, Professor of London Business School, has written books about the interface between people and organizations, including "The Shift" and "The Key".

and addressing global challenges. This idea is also referred to as 'Common Good', which Ikujiro Nonaka*[11] has emphasized. Indeed, many enterprises now see this as a responsibility of business. Fujitsu, GE, Unilever, Nestle, DuPont and many more companies have aligned their business objectives with social goals. Today's businesses need to find ways to deliver sustainable value in a way that benefits society.

The imperative of delivering business growth and the higher aim of achieving shared value come together in a human centric approach. By putting people at the center, organizations can not only secure their own prosperity, but deliver sustainable value to society.

Human Centric Innovation

Human Centric Innovation is an approach to creating business and social value by empowering people with the power of technology. It realizes innovation by empowering people through connecting us with information and with the things around us – the infrastructure of the physical world. It creates value through connections in a hyperconnected world.

In the past, innovation has typically been standalone and discrete. But by bringing together the three dimensions of people, information and infrastructure we can create the connected solutions and services that will be vital to realizing value now and in the future. These three dimensions are key management resources for organizations.

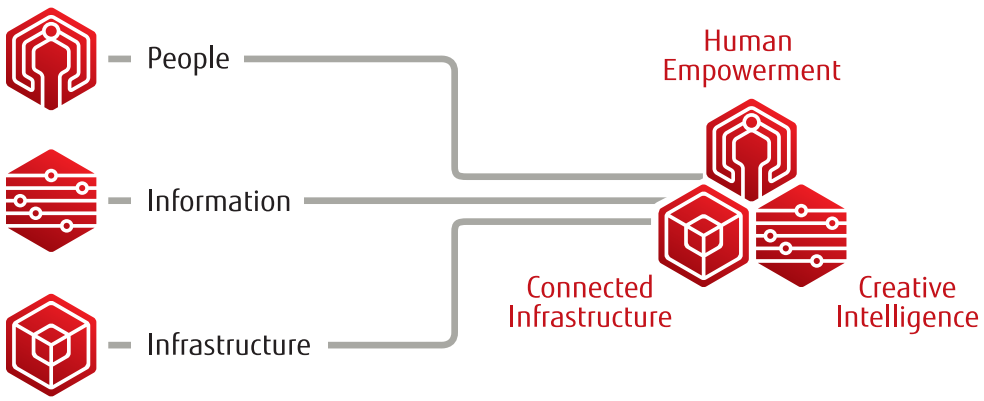
Human Centric Innovation comes from the convergence of three core values:

- Human Empowerment:
  how an organization connects and empowers people, and enhances their experience.
- Creative Intelligence:
  how an organization creates knowledge from information, and uses it across boundaries.
- Connected Infrastructure:
  how an organization connects and optimizes business and social infrastructure with technology.

These three values are interlinked. Innovation in a hyperconnected world means converging multiple streams of data - from human to human, human to machine, and machine to machine to find out insights and create new value.

All people process information in the same way. We sense, we analyze, we decide and we respond. This is not a single, discrete event but something we repeat, continually. With each cycle we build up knowledge and create new

Human Centric Innovation



*11 Ikujiro Nonaka, Professor Emeritus of Hitotsubashi University, has written books about knowledge management, including "The Knowledge Creating Company" and "Managing Flow: A Process Theory of the Knowledge-Based Firm".

Developing insight, a cyclical process

value. Human Centric Innovation is no different. It leverages the benefits of digitalization through the same cyclical model that people use: "sense, analyze, optimize, and act". Fujitsu's Intelligent Society Solution SPATIOWL, a location-cloud service, is a good example of this.

In Tokyo, Fujitsu has equipped four thousand taxis and other commercial vehicles with sensors, which send a stream of location information to our cloud data center.

The service senses this information and maps it against other data sources – which may be fixed like locations of petrol stations and restaurants, or dynamic like weather conditions and social media activity. The system mashes all these inputs together onto a time and space database.

By converging these multiple data sources and analyzing them, we are able to optimize solutions to various needs – accurate real-time navigation, guiding vehicles to nearest fuel (or other energy) stations, alerting people to congestion or areas with a higher risk of accidents. These context-aware services can be provided to drivers through smart devices, which they can easily respond to.

Customers are increasingly using our SPATIOWL location-cloud service as a digital platform to connect people with various forms of information in their cars and with other physical infrastructure. The most recent example is for a hydrogen station data management service.

To respond to the challenge of climate change and use more environmentally friendly technologies, fuel-cell vehicles and hydrogen stations are being developed across the industry. In December 2014, Fujitsu began a cloud service enabling people to access real-time information on the location and availability of hydrogen stations.

As an emerging technology, the infrastructure to supply hydrogen is not widely distributed. Until hydrogen stations become as ubiquitous as gas stations, drivers will have to plan ahead. Furthermore, there are two types of stations – a fixed station and a mobile station. It is an immediate challenge to provide accurate information to drivers where hydrogen is available now.

Using SPATIOWL's hydrogen station data management service, Toyota Motor Corporation started to provide a specialized service for its fuel-cell

vehicle, 'Mirai'. A Mirai driver can use a 'Hydrogen Station List' application as part of the Mirai's navigation system as well as its `Pocket Mirai` a smartphone app. These services enable drivers to always know their source of fuel and availability.

Fujitsu plans to develop the service to encourage a wider ecosystem of car manufacturers and fuel suppliers to form, making it easier to leverage this green technology.

The story shows how Human Centric Innovation can be applied at scale across industries. But this is not just about big, high-tech solutions. Human Centric Innovation can be applied at simpler, more granular levels. The principles are the same.

A Roadmap for Business Growth

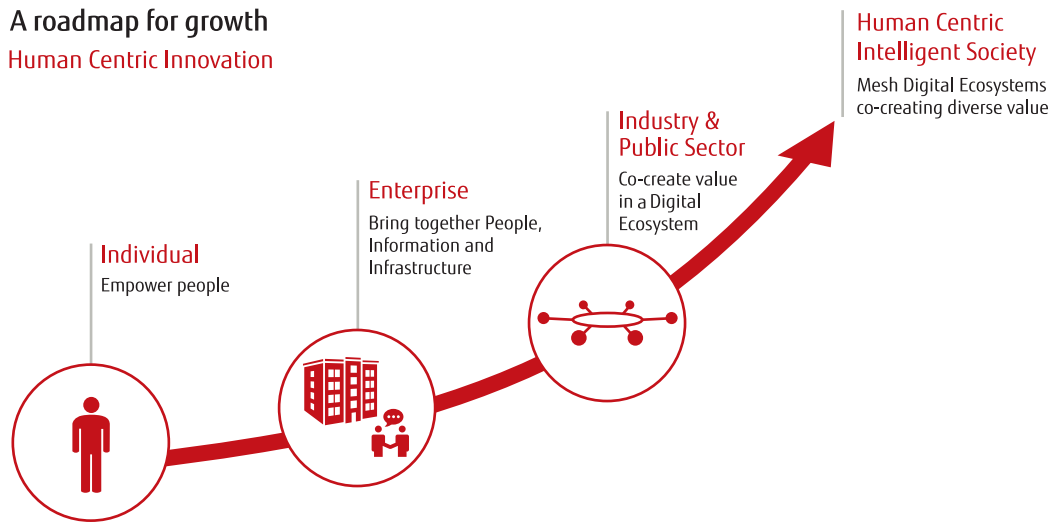
We believe CEOs and other leaders can use Human Centric Innovation to create a natural business roadmap for growth. We can think about it at different levels, from the individual, to the enterprise to an entire industry and public services. When we do this, it forms a logical sequence of steps.

So, we might start with individuals. Here we consider how we empower our people so that they can more openly collaborate within their organization as well as in outside communities. Next, at an enterprise level, the focus becomes the transformation of business model by bringing together people, information and infrastructure. And then, at an industry and public service level, an enterprise can co-create greater value by shaping emerging digital ecosystems with other companies, governments and research institutes.

The culmination of this roadmap is a Human Centric Intelligent Society, our vision of a prosperous and sustainable society. We believe that by helping our customers to undertake a digital transformation in a human centric way, we can encourage new ecosystems to form that will deliver shared value that the whole of society can benefit from.

This is a journey that we want to undertake with all of our customers and partners. The business roadmap belongs to you. We want to help you, to support and enable you, and to share your journey. But we travel it in the context of what it means to your organization.

Let's look at these steps in turn.



Steps of Human Centric Innovation

	Individual	Enterprise	Industry & Public Sector
People	• Nurture skills and talents • Make 'places' for internal collaboration and open community activities	• Integrate enterprise-wide collaboration platform • Understand individual customers and provide an enhanced, context-based experience	• Foster inter organizational relationships • Develop shared goals linked to social value
Information	• Develop principles and controls that encourage information sharing	• Manage enterprise wide-data • Converge data and draw insights • Implement holistic measures for identity, security and privacy	• Understand private and open IP • Exchange data • Establish ecosystem-wide security and privacy standards
Infrastructure	• Allow people to access technologies and tools	• Integrate physical and digital • Digitalize and connect products and process	• Connect through open digital interfaces • Agree standards and touch points

Empowering Individuals

As we saw in the previous chapter, in a hyperconnected world, anybody can be a challenger and anybody can innovate. Therefore, the roadmap begins with people. Organizations need to leverage the imagination and resourcefulness of their people. But how can we encourage people to work more creatively?

It is important that organizations make space for innovation. As we have argued, innovation is no longer confined to in-house labs and development centers. New ideas are inspired through joint work not only on the inside but with outside communities and with consumers.

TechShop, Inc. is one of the leaders in the 'Maker Movement'. They provide workshops equipped with a large variety of factory grade machine tools – including 3D printers – but at a reasonable cost. They offer the use of any of their workshops in the U.S. for $125 per month.

Their workshops attract people from all sorts of backgrounds - from entrepreneurs, and designers to hobbyists and students - all under the same roof. TechShop has inspired many innovations. Square, a startup company, created a credit card reader attachment for smartphones, expanding business world-wide. Embrace's portable incubator is already estimated to have saved the lives of 100,000 babies in developing countries. This is a place where anyone has the opportunity to build their dreams.

Fujitsu is partnering with TechShop to accelerate open innovation activities involving individuals, enterprises, schools and research institutes. To begin with, TechShop and Fujitsu have created a unique educational opportunity for students in California. 'TechShop Inside! – Powered by FUJITSU' is the world's first mobile makerspace, housed within a seven-meter long trailer. This space is loaded with the same workshop environment including a 3D printer and laser cutter, alongside Fujitsu computing equipment. We are proud of this collaboration to inspire the next generation of innovators.

Giving individuals access to digital technology creates an environment where knowledge can be easily shared and creativity encouraged.

For instance, since 2012, Fujitsu has deployed a global communications platform for all 160,000

of our people, allowing greater collaboration and faster decision making. It has realized real-time communications and knowledge sharing, using integrated voice, email, web & video meetings as well as social networking. In addition, we are transforming our work style using smart phones and tablets, enabled for BYOD (Bring Your Own Device) with virtual desktop capability. This also has led to a reduction in travel, lowering the environmental burden substantially. We have shared our experience with our customers. Now, around 150 enterprises with the total of over one million people are using this communications platform.

So digital technology can be a powerful enabler of collaboration and creativity. Next, how can an enterprise transform their business models and create innovation?

Transforming business

A successful business needs to perform well against three strategic priorities: operational excellence, product leadership and customer intimacy, and excel in at least one of them. By adopting a human centric approach, we believe organizations are better equipped to deliver against these capabilities.

Human Centric Innovation enables an organization to empower people by connecting physical infrastructure and harnessing information. It might enable them to understand the intentions of individual consumers and engage with them. It could help enhance the value of products and services and customer experience by making them connected. It could also allow them to streamline their operations with end-to-end digitalization.

Let's look at some examples which illustrate in more detail how Human Centric Innovation can be applied in the enterprise.

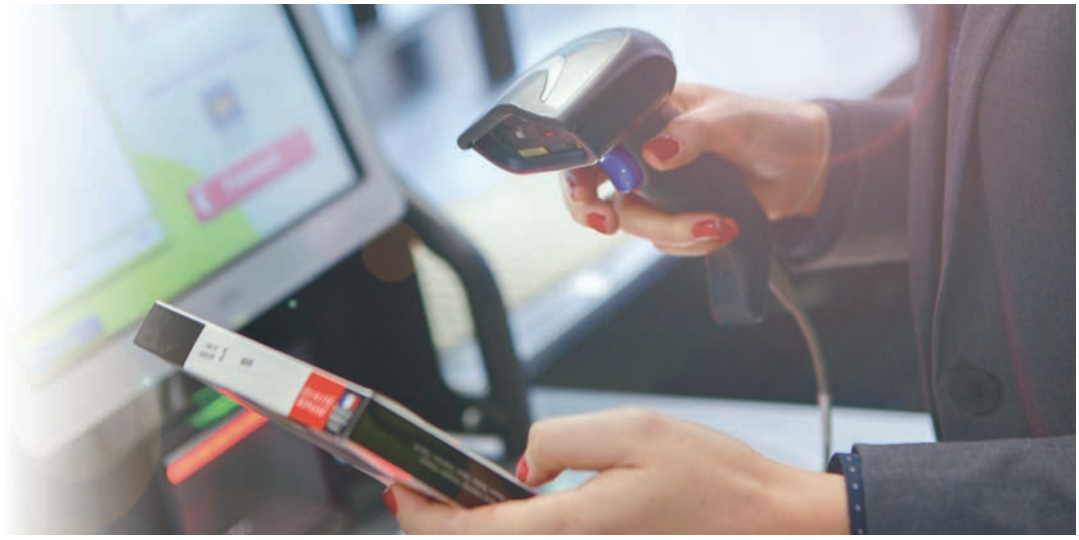
Engaging Customers

Today, one of the most striking challenges an enterprise faces is the changing needs of consumers. Today's consumers have high expectations and unique preferences. They have instant access to market data which can quickly lead them to the best deal. And through social and connected technologies people can even choose to share things rather than buying.

Businesses can no longer operate on a one-size-fits-all basis. They must use connected technolo-

TechShop Inside! - Powered by FUJITSU

Auchan Self-service Checkout



gies to reach out and engage with their customers and respond to their highly personalized needs. They must align their operations so they can deliver great experiences whichever channel the customer chooses. To do this an enterprise must understand and engage with its customers, thereby building relationships and empathy.

In Japan, Dentsu, Inc., the world-leading advertising agency, and Fujitsu are collaborating in applying big data analytics to marketing. Both companies have determined to combine their complementary experience in marketing and data analytics to support the marketing strategies of our enterprise customers. We jointly set out an initiative called the 'Customer Experience Design Framework', to leverage accumulated knowledge about individual consumers and provide insights which could improve their experience.

Shizuoka Gas Company, Ltd., a Japanese utility company, is one of the customers that is benefitting from this framework. Marketing transformation became a key priority for them, to cope with an anticipated increase in competition triggered by deregulation of the utility industries. The Dentsu-Fujitsu team assisted Shizuoka Gas in analyzing their customers, segmenting them and visualizing their purchasing intentions. Shizuoka Gas built a solid marketing platform for enhancing customer intimacy and was awarded the CRM Association of Japan Best Practice Award for its exemplary CRM initiatives.

In the retail and retail banking sectors, Human Centric Innovation provides a means to empower consumers as well as businesses. It can enable differentiated services and enhance customer experience by connecting physical infrastructure and digital information.

For example, by visualizing the movements of sales assistants and customers on the shop floor, insights can be generated leading to a better service. This allows sales people to modify their behavior, for instance where they stand, how soon they approach, in ways that are most beneficial to customers. At a clothing store, automatic identification by RFID tags attached to individual items enables the retailer to understand what goods each customer has tried – and rejected – as well as to streamline their end-to-end operations.

Human centric technologies can also give people a better experience of interfacing with a service. Fujitsu's PalmSecure biometrics identification solution, for instance, enables fast, contactless personal identification by scanning palm veins. It is now deployed in banks and hospitals, serving more than 50 million people in many places around the world.

Group Auchan SA is a leading global supermarket chain with over 1,700 stores around the world. They have adopted Fujitsu's unique self-checkout solution, giving customers the most convenient way to pay and greater flexibility for the business to serve them. Each customer can choose their preferred ways. A handheld scanner enables customers to scan each purchase as they move around the store. Furthermore, a hybrid attended checkout solution allows Auchan to rapidly switch between self-checkout mode and traditional cashier-operated mode in less than two minutes to reduce long lines as soon as they begin to form.

Another Fujitsu customer, CaixaBank,S.A. in Spain, has conducted workshops with customers to determine the best set of features for their new ATM solution. Fujitsu designed the solution in response to this and manufactured it in our production facility in Malaga. It allows customers to use contactless cards and make transactions swiftly. It offers an avatar using sign language, high-contrast screens, large text and buttons, screen reader or keyboard navigation. It is easy to use by people who might normally struggle with such services, like elderly and disabled people. With this new solution, CaixaBank has achieved higher customer satisfaction and operational efficiency.

A human centric approach is not limited to consumer industries, however. It also applies to fields that don't automatically make you think of people. We may associate manufacturing, for instance, with automation and mechanization. But here too, empowering people creates big benefits.

Manufacturing

Continuous improvement is a vital practice for any manufacturer. The key is to achieve an environment where people and machinery can work in harmony.

One such company is Omron Corporation, a Kyoto-based manufacturer of industrial control equipment and healthcare sensors, operating in 80 countries around the world. Their challenge

was to visualize points for improvement in their manufacturing process. As an electronics manufacturer with complex, interconnected production lines, this was not easy even for their experienced engineers.

Fujitsu has developed a prototype system for visualizing an entire production line by aligning production data across multiple manufacturing processes for each manufactured product – in this case printed circuit boards. This system has augmented human capability with objective data analytics of production processes. As a result, Omron achieved a six times increase in efficiency of their quality improvement and a 30% increase in productivity over several months. This continues to rise even now. The company strengthened their operational excellence by empowering their people with analysis of machinery data.

To meet customer needs that are more diversified, granular and fluid, it is vital for manufacturers to be able to produce specialized products with high quality in an agile and flexible way. End-to-end digitalization in a human centric way is a means to enable this. In such an environment, all information is connected throughout the production process. People can work even more effectively with machines - like industrial robots – and even to collaborate with them. Fujitsu is taking such an approach in our own product manufacturing facilities.

Fujitsu is building technology, tools and knowledge to realize a human centric `connected factory'. We will strengthen our development platform – our engineering cloud - which complements design work with knowledge and machine learning. We are further developing a manufacturing navigation system which enables real-time control and predictive troubleshooting based on data analytics throughout the product life-cycle. We are also realizing technologies to automatically apply improvements made by factory staff, enable changes to factory automation flexibly and autonomously and allow dynamic allocation to multiple manufacturing lines.

Our aim is to double the productivity and reduce a delivery lead time by half. Fujitsu will provide our technology and knowledge, and contribute to building industrial ecosystems together with our customers and partners like factory automation and robot makers.

A human centric approach enables an enterprise to create value from connections. Connections expand beyond the boundaries of an enterprise, spread across industries.

Creating value across industries

Fujitsu believes that in a hyperconnected world the way we do business will fundamentally change. As more and more products, services and processes are digitalized, digital ecosystems will emerge as the key drivers of consumer and social value.

We can see this today in the digital ecosystem that has formed around smartphones. Smartphone hardware, software and network services are provided by different businesses, based on standardized digital interfaces. Furthermore, millions of applications, ever increasing everyday, are provided by businesses and an enormous number of individuals. Each consumer creates their own unique combination of services and content that fits their lifestyle, and at low cost. We are familiar with this concept in the context of smartphones, but increasingly more things and services will be digitalized and transformed in a similar way.

With this model, businesses in different industries – perhaps retail, transportation, finance and healthcare – can come together to deliver an individual experience. A smart drug for instance or a digital ticket. From the viewpoint of a customer or citizen, he or she can flexibly choose and consume a mashup of digitalized products

and services from the ecosystem.

Digital ecosystems offer value by exploiting a feature of digital business models that we have already seen with digital music and eBooks. In the physical world, economies of scale mean popular products have lower transaction costs than unpopular ones. There is no such constraint in the digital world, and therefore a wide diversity of consumer preferences can be met with minimal cost.

The digital ecosystem is a way for physical businesses to act as though they are digital businesses. By co-creating value in the ecosystem, product features can be delivered inexpensively and scaled rapidly, to fit specific consumer demands, even tailored to individual preferences. It enables a high degree of feature specialization at a low cost. This is a significant change in the way industries create value and we believe this will be a paradigm shift in the way the business works.

Digital ecosystems connect diverse hardware and software products, services and processes through digital interfaces. Participating organizations will need to decide which intellectual property (IP) they open and share among the ecosystem partners and which remains closed as a core competency.

To shape a digital ecosystem, it is vital to create such open digital interfaces and provide tools and standards for sharing information. To this end, a cloud-based digital business platform will is a key. Cloud plays the crucial enabling role as the medium for connecting people, information and infrastructure, across the boundaries of existing industries.

Working with our customers and partners, Fujitsu is co-creating value for people by building digital business platforms and shaping digital ecosystems.

We have already started building digital ecosystems in a variety of fields, encompassing healthcare, transportation, food and agriculture, education, smart energy, disaster-resilience and environmental protection. Let's look at early-stage examples that we are working to grow.

Wellbeing of people

70% of the 29,000 child deaths that occur each

Digital ecosystem for wellbeing of People

- Personal Health Record (Regional Medical Network)
- Tailor-made Medical Treatment
- IT-based Drug Discovery
- Medical Simulation

day, mostly in developing countries, could be prevented with proper access to medical resources.*12 Improving healthcare environments remains an urgent issue in these countries. At the same time, in developed countries, life expectancy has now reached 77 years and continues to rise.*13 The proportion of older people in the population is growing, even in some developing countries. It is a growing concern for society to keep the quality of life for elderly people, as well as extending medical care. How can technology contribute to these goals?

In healthcare and life sciences, cloud-based platforms have great potential to connect healthcare services, elderly care services, businesses and academic institutions. This will realize a totally new value proposition for proactively improving the quality of life and wellbeing of people, instead of the reactive treatment of patients.

Fujitsu established our Next-Generation Healthcare Innovation Center in December 2013. Since its founding, the center has conducted a number of studies with advanced medical research institutions, specialists and companies in Japan and around the world on such topics as promoting public health, preventing serious diseases, early diagnosis of diseases, new drug discovery, and personalized medicine.

As we introduced in last year's Fujitsu Technology and Service Vision, the Research Center for Advanced Science and Technology (RCAST) at the University of Tokyo is using Fujitsu's Technical Computing Cloud for the discovery and design of new drugs. In August 2014, RCAST, Fujitsu and Kowa, a pharmaceutical company, jointly succeeded in identifying new active chemical compounds that inhibit the activity of cancer-causing protein. Our new technology achieved a far greater success ratio than the conventional low-molecular-weight drug discovery technologies. In this collaboration, Fujitsu's role was to design molecular drug candidates.

In another initiative, the University of Tokyo and Fujitsu jointly developed a human heart simulator using a supercomputer. This work is vastly complex. The simulation calculates precisely the movement of 640,000 heart muscle cells in one and a half heartbeats.

To accomplish this with conventional computing resources we think would have taken about three years. Now, with the K supercomputer which

*12 unicef "Reduce child mortality" *13 United Nations Population Division

Fujitsu and Riken jointly developed we can perform it in 17 hours. We expect to apply the technology to assist in surgery of congenital heart diseases, which require highly sophisticated judgment and skills. The combination of medicine and digital technology is creating new innovation.

Urban Mobility

As more and more people are moving into cities, megacities are emerging in many places in the world. 54% of the world's population lives in urban areas in 2014. By 2050, it is projected that this number will rise to 66%.*14 Planning for high density living is a key social concern, from the managing of city resources and environment to the enabling of urban mobility.

The Singapore government has a vision to become the world-first Smart Nation and is building an intelligent national platform. In October 2014, three parties comprising of Fujitsu, A*Star – Singapore's Agency for Science, Technology and Research - and Singapore Management University signed a contract to jointly set up a Center of Excellence (CoE). The CoE's objective is to harness high performance computing (`HPC`) capabilities to develop solutions for sustainable urban operations, with researchers using Singapore as a 'living lab' to test-bed next generation solutions to real urban issues. One of the three main projects is called Dynamic Mobility Management, which aims to reduce congestion in the city. Fujitsu will leverage expertise in big data and HPC-enabled simulation to pursue their joint research work within the CoE.

Fujitsu's SPATIOWL system, which we mentioned before, is being adopted outside of Japan. In Indonesia, a toll road management company is using the system to provide congestion information to drivers via their smartphones. The company intends to use the system to implement variable road pricing, to account for fluctuations in demand. In 2014 Fujitsu started to undertake a new project with our partners in the city of Barcelona.

Safer food

Another example is a digital ecosystem for safer food. Securing the food supply is a growing concern, especially for developing countries, where populations continue to expand. In many places in the world, agriculture is still conducted by people without access to technology. How can ICT help increase yields and improve food quality?

*14 United Nations "World Urbanization Prospects", 2014

Aizu-Wakamatsu Akisai Vegetable Factory

At the same time, food supply chains have become intricate involving many different players from production to distribution to retail. Securing transparent traceability in the midst of this complexity is an urgent issue. How can ICT enable better value, quality and safety in the food we consume?

Fujitsu has begun several initiatives in this area. In an unconventional departure for an ICT company, we have turned clean-room facilities, once used to produce semiconductors and circuit boards, to food production. Using sensors and data analytics we have grown a high quality lettuce with a very low level of potassium. It means people with chronic kidney diseases (`CKD`) can safely eat it. One in eight adults have CKD in Japan, while the total number of patients could reach 600 million in the world.

We are building a cross-industrial ecosystem through Akisai, our agriculture cloud, which is already used by more than two hundred businesses across Japan. We have begun to introduce this into other countries too, with a system being adopted in Hanoi in Vietnam.

Now, Asahi Shuzo Co.Ltd., a Japanese Sake brewery has become the latest Akisai partner. They produce 'Dassai', a world renowned sake that is exported to more than twenty countries and is commonly found on the menus of Michelin-starred restaurants. Yet their global success has produced a problem. Dassai owes its unique fruity and aromatic flavour to a particular variety of rice, called Yamada Nishiki. But this rice is difficult to grow. By sharing knowledge and establishing the best-practice use of technology, Asahi Shuzo hopes to leverage the ecosystem to increase the total production and secure the supply and procurement of this particular variety of rice.

These are some examples of ecosystems we are starting to build around digital platforms, many of which are in their early stages. But these ecosystems are expanding in many places, and we passionately believe that this is a model that will deliver the social and business value and growth that will secure our futures.

In this chapter, we have looked at Human Centric Innovation and how it is being applied. So now let's turn to look at what Fujitsu has to offer our customers and how we will build the future.

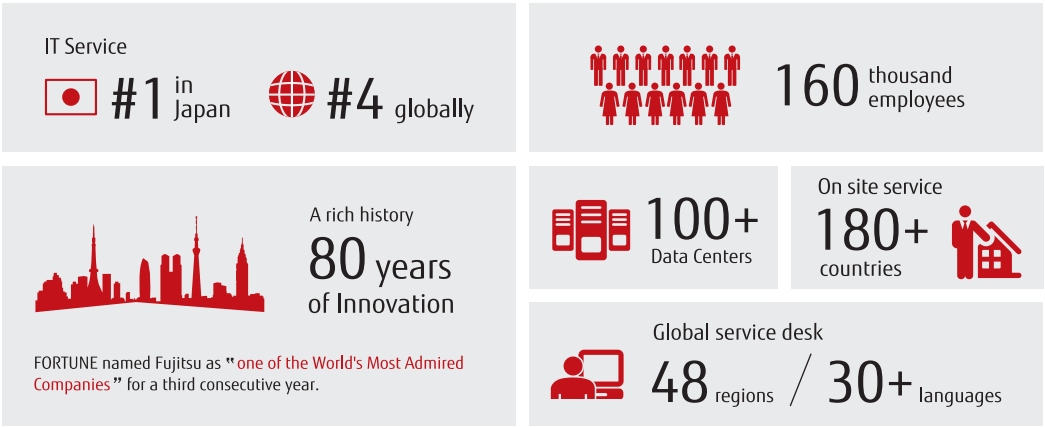
Chapter 3

What we can do for you

Our people will help you transform your business and together build a better society.

Fujitsu offers a portfolio of technologies and services to meet your present and future challenges. To help realize innovation and the growth you need, we deliver a platform for the future.

FUJITSU at a glance



Your Innovation Partner

In this period of very dynamic change, what can Fujitsu do for our customers? We want to be your innovation partner. As we argued in Chapter 1, organizations need to embrace digital transformation, but this is not easy. You need a partner you can trust. We will help you cope with challenges and maximize the opportunities to transform your business. We do this by combining your business knowledge with our technology expertise.

To shape the future, we are collaborating with our customers everywhere around the world. Together, we want to drive and shape digital ecosystems, to deliver greater value - centered on people - which we believe will be so important for creating a better future.

Why Fujitsu?

Fujitsu is unique. Here's why we are different.

People are the foundation of our company and our culture. They lead the innovation of our technology and take care of our customers, all over the world, through the many different products and services we offer. We have over 160,000 people, all working to make our customers happy. Fujitsu is a human centric organization.

As a result, we take a human centric approach to our work. We understand that one size does not fit all and every customer has different requirements. We listen, and try to understand our customers' needs, working together to find the right solutions. We practice `field innovation': observing the operations of our customer, deriving insights and helping them overcome their challenges. As our customers move to a hyper-connected world with 'plug and play' requirements, Fujitsu is the partner that can be relied upon to deliver full integration for their business needs.

At Fujitsu, everyone is a challenger. Throughout our 80-year history we have continuously stepped up to new challenges, starting from telecommunications equipment to computers and IT services. We are genuine in pursuing these challenges. All of us share a common value expressed in the Fujitsu Way and work to help realize dreams of people and a better society.

Fujitsu is organized in a way that helps us achieve all this. We are the fourth largest IT service company in the world and the largest in Japan. But while our core capabilities are scaled for global operations, our regional and local organizations are set up to respond to customer

needs, providing tailored services and face-to-face relationships. Fujitsu has more than 100 data centers throughout the world, and provides on-site service that covers over 180 countries and service desks offered in over 30 languages.

Much of what makes Fujitsu different stems from our culture and heritage. As a Japan-originating company, we have a unique heritage. We pursue a relentless quest for quality and reliability for our products and service through continuous improvement.

Technology challenges

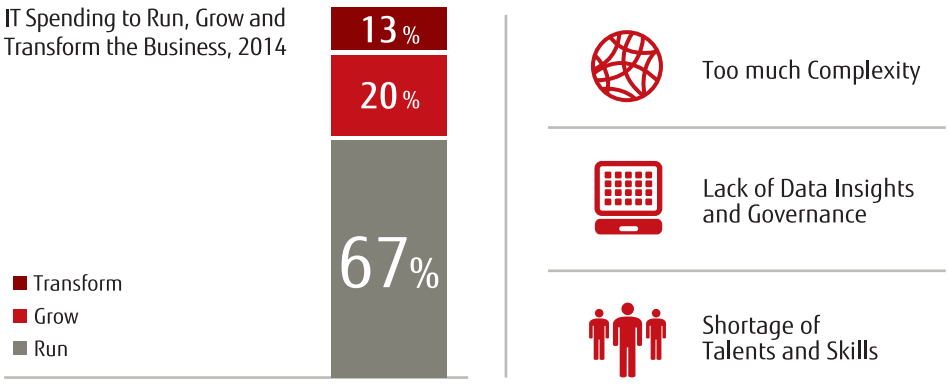
As business evolves, new applications are needed and added to enterprise IT systems. Technology also advances at a rapid pace, driving regular upgrades of enterprise infrastructure. This continuous evolution has led to huge complexity of IT systems. When we are called in to analyze a customer's application estate, we always find enormous variety. Some applications are frequently used, while some are hardly touched. Some are linked, while others are stand alone. Understanding the business rationale and the implications of change are big challenges for many enterprises as they struggle with this growing complexity.

Financially, the complexity of IT systems poses a difficult problem. On average, 67% of the total IT cost is used for just 'keeping the lights on'.*15 As we have seen in the previous chapters, the need for innovation is becoming more important than ever to deliver business growth. How an organization can digitalize its business must be a key priority. Yet the reality is most enterprises can call on only a third of their budgets for new projects for business growth and transformation.

How an enterprise can draw insights from data is another big challenge. New technologies for analytics, customer engagement, digital marketing as well as cloud and the internet of things are enabling new capabilities for business intelligence. In many cases, these are implemented in the lines of business or the marketing function. While it is important to apply technologies with agility and flexibility, central governance of IT systems is crucial to control enterprise risks such as security and privacy protection. Exposure and misuse of data is a growing concern.

New technology requires talents with new skills. Businesses need system engineers and software engineers – with the right skills - to enable digital transformation and drive innovation. In the era of the IoT, organizations need multi-disciplinary skills to embed software into hardware products or machinery, bringing together physical

The challenge of enterprise IT



Graph created by Fujitsu based on Gartner data*15

*15 Gartner "IT Key Metrics Data 2015: Executive Summary" Linda Hall et al, 15 December 2014
Note: The value for 2015 is a projected figure and is based on projected 2015 IT budgets provided by Gartner clients.

and digital elements.

How can an enterprise address these challenges to cope with the growing complexity of IT systems? How can it invest more resources for innovation, govern new digital technologies and enterprise-wide data, and nurture talents to create innovation? How can an enterprise build IT systems and shape digital ecosystems to realize Human Centric Innovation?

We believe a hyperconnected world means a radical change in the underlying IT architectures. To address these key questions, it is important to understand how a new type of system is emerging and how it will integrate with traditional systems.

Two Worlds

The traditional role of IT in the enterprise has been to improve the productivity of the organization. It has automated many transactional tasks previously done by people. For example, taking orders, managing production and supply chains and financial accounting. IT has facilitated and automated many transactions within the enterprise and with its customers, suppliers and partners. This style of IT is called Systems of Record (SoR).

An SoR handles transactional operations and accurately records and stores the data. It essentially replicates business process with software code, enabling speed, accuracy, reliability and reusability. An SoR interfaces with a relatively limited number of people – usually restricted to the employees of the enterprise or a subset of them, mainly via PCs.

An SoR is process-driven. It is rigid (hard-wired) for pre-determined transactional procedures. Its data is structured in a database format, and its volume, even for a large-scale business, perhaps only measured in terabytes.

As we have already said, as we move into a hyperconnected world, the value proposition of technology is changing. Its role must become human centric, to connect people, not only colleagues and partners but consumers and citizens. And not only that, connect products, processes and physical infrastructure. The technology architecture that this capability calls for is Systems of Engagement ('SoE'). Fujitsu's SPATIOWL location data cloud service and Akisai agriculture cloud service that we described in the previous chapter are examples of these.

An SoE connects people through various mobile

Two Worlds

Systems of Record	Systems of Engagement
Limited number of users	Huge number of users
Fixed scale	Variable scale
Rigid, Secured	Flexible, Agile
Internet	Internet of Things
Business Intelligence	Big Data Intelligence
Known process, Process driven	Unknown process, Data driven
Structured data	Unstructured data

devices and provides a rich and empowering experience. And an SoE connects things as well as people. Because the system interfaces with a potentially vast number of end points – whether they are human or machine - it flexibly scales and handles a significant volume of data - which may be made up of unstructured data like video and text - and it does it all at speed.

While an SoR deals with discrete processes, an SoE must deal with activities that are harder to define and know. This is not process-driven but data-driven, designed to find out insights from data, create hypotheses and test them.

An enterprise must maintain and streamline the existing SoR to enhance business operations, while at the same time undertake to build a new SoE to create insights and engage with customers. To resolve the technology challenges we mentioned earlier, an enterprise should consider transformation of their people and systems.

Talents for co-creation

To be successful in the emerging hyperconnected world requires an organization to establish a new style of work and nurture the right set of talents. Application development for SoE requires a different mindset and a different set of skills. Innovation is inspired and co-created by connected people.

Traditionally, creation of an SoR has followed a waterfall approach. Here, development proceeds in separate phases, based on a detailed set of requirements, and moves from designing of system architecture, coding of software, to integration and testing.

In contrast, development of an SoE takes place against a business objective rather than a set of definitive requirements. It takes an agile style – making a prototype, updating it continuously and frequently, and moving on to conduct a proof of concept and a proof of business.

Engagement applications or IoT services are increasingly co-created with customers and partners. For example, Fujitsu's Akisai agriculture cloud service was developed from our engineers' experience of working and collecting data from sensors and mobile terminals in the customer's farm. Through trial and error, they succeeded in crafting an effective model for visualizing the farm's work processes and improving its productivity and quality.

Fujitsu hackathon (attended by start-up employees and university students)

Photo by: Seiya Kawamoto Source: Ashita-Lab

This kind of development requires leadership with a more holistic skillset, combining an understanding of architecture design and coding with a knowledge of business and finance. Each member of the project must be empowered to act creatively and autonomously. A counter-intuitive characteristic of the approach is it must be able to tolerate failure. Failure in this context should be seen as a natural step in a creative process, a necessary route to achieve the business objective and the overall success of the project.

To meet this new style of working, Fujitsu is encouraging greater autonomy for our engineers and creativity in our leaders. To support this objective, for example, we are promoting 'hackathons' and open innovation activities. Various people from Fujitsu and outside gather in a workshop, generating ideas for new engagement applications or IoT solutions and completing prototypes within a few days.

Digital Business Platform

What kind of system should an enterprise consider building to enable innovation? To begin with, it is crucial to simplify and reduce the complexity of the existing IT systems and the cost required for operations and maintenance. Depending on the IT environment of each enterprise, there are several ways to approach this challenge. For example, an enterprise may wish to visualize the entire estate of IT systems and applications to eliminate outdated, unused applications. They can virtualize and consolidate server infrastructure, and they can consider migrating applications to hybrid cloud environments. Furthermore, it is important to automate operations and maintenance.

In order to realize digital transformation in a human centric way, we need a business platform that connects people with digital information and physical infrastructure. The digital business platform bridges and aligns both the SoR and SoE architectures, on an end-to-end, enterprise wide basis. Furthermore, it allows digital interfaces to be created, to enable other parties to collaborate and digital ecosystems to grow. We call this architecture a 'hyperconnected system'.

Why should you consider aligning SoR and SoE? In the framework of 'sense, analyze, optimize, act' that we saw in Chapter 2, an SoE performs the sensing and analysis function that leads to

new insights. The SoE connects people - from customers and citizens to the staff of your own organization - as well as physical things and technology infrastructure.

In order to create value, the next step is to apply insights to optimize operations and take actions. The core operations like production and supply chains are managed by the SoR. So the SoR and the SoE need to be integrated, and allowed to interact. With such a platform in place, an enterprise can make real-time judgments, realizing high customer and business value.

A digital business platform helps empower people by enabling collaboration among colleagues and enhancing the experience of consumers. It connects end-to-end business process – services that might previously have operated in silos - and manages enterprise-wide data. It is open standard-based, equipped with application programming interfaces (APIs) to connect diverse systems and applications for creating digital ecosystems. It is also a platform to connect IoT technologies. By bringing together knowledge of people and knowledge created from data, an organization can enhance operations, competitiveness of products and services, and customer experience. The digital business platform is designed for enabling Human Centric Innovation.

Fujitsu is undertaking an initiative to build our own digital business platform. We have created visualizations of our internal systems and consolidated our server infrastructure. In February 2015, we began to migrate all our internal IT systems to an OpenStack-based new cloud system. We will do this on a step by step basis.

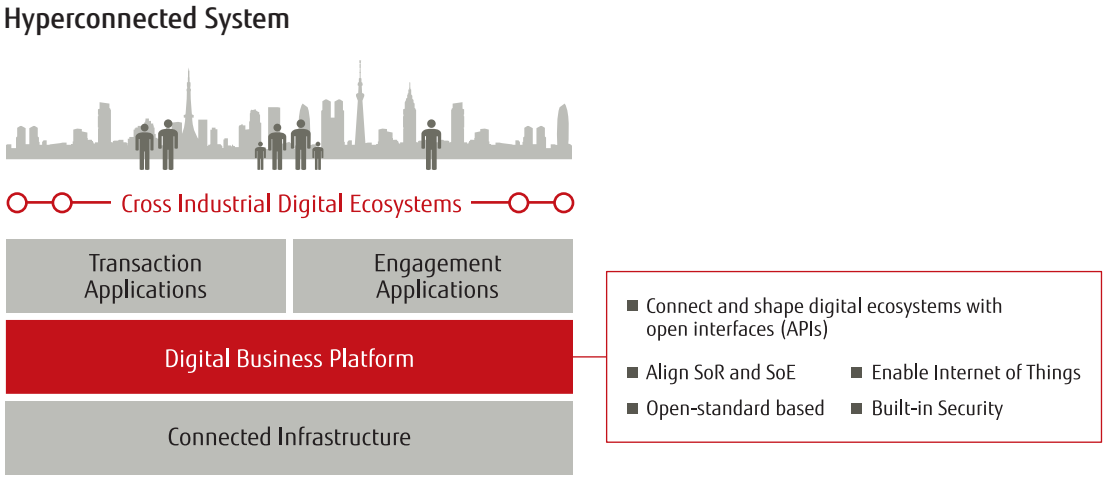
The new cloud system is highly scalable, forming a core infrastructure for the digital business platform. It provides easy-to-use patterns created from accumulated system development knowledge. It enables automatic system configuration and operations management, reducing the costs for keeping the lights on. It comprises service modules for analytics, mobility, IoT and cloud integration. It also includes built-in environments for agile development and a high level of security functionality.

We make each application to be linked with other applications through Web API, enabling easy access from internal and external environments.

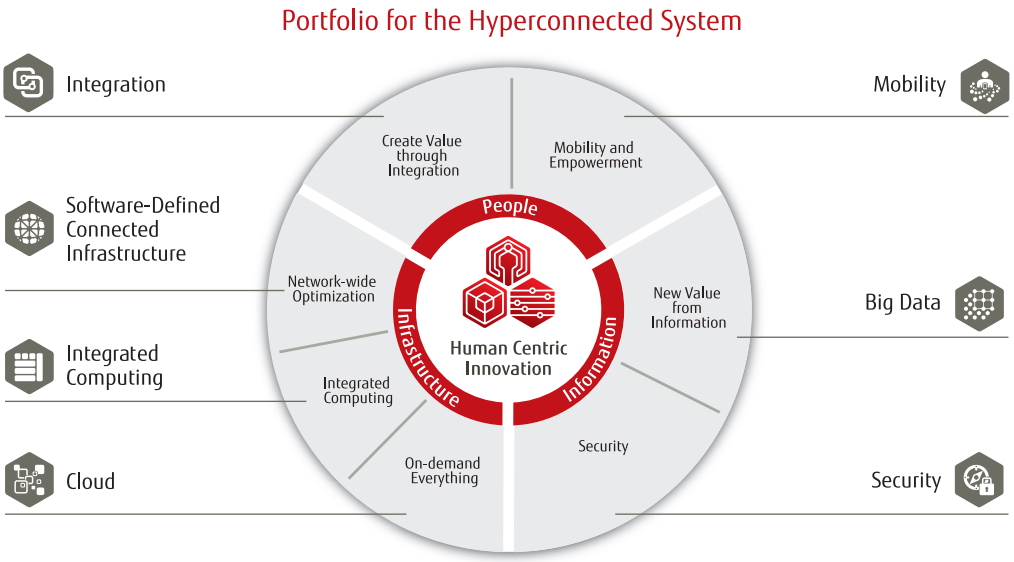
Technology and services we provide

To realize the core values of Human Centric Innovation, Fujitsu offers an extensive portfolio of services, products and solutions.

Our portfolio provides all the building blocks to



The technology and services we provide



build the hyperconnected system we have just described. For human empowerment we provide integration services and mobility. For creative intelligence we provide big data and security solutions. For connected infrastructure, we provide cloud, integrated computing and software-defined connected infrastructure.

As your innovation partner, we combine these technologies and services to help you deliver better value to your customers and achieve the innovation you need to transform and grow your business. Fujitsu's strength is that we are one of the very few ICT companies which can provide such a wide technology and service portfolio. We will continue to strengthen our portfolio with our own intellectual property complemented by our partners' technologies. You can find the details of our portfolio in the separate booklet.

Relationship between People and Technology

Fujitsu believe people and technology will form a new relationship. Technology is a natural extension of human beings, enriching our experiences and enabling us to be more creative. To do so, how will it evolve?

To provide context-aware services, future technology will be able to understand how we sense, how we feel and what we intend. Technology will be increasingly modeled on human senses and replicate natural, human capabilities, like the intonation in speech. For example, Fujitsu has developed tiny eye-tracking sensors to know what people are looking at, and technology to detect phone frauds by interpreting patterns of speech. We have developed a technology that conveys a sense of touch via the screen of a tablet, giving a sense of slipperiness or roughness depending on the image being displayed. We have synthesized a natural spoken voice, capable of expressing meaning through tone as well as words. If used for an emergency evacuation for example, an announcement could be given greater urgency by using a serious tone of voice.

It is human nature to always be searching for patterns and context. When we are born, we start learning the names and meanings of the things around us. Creativity of human beings comes

from making new links and connections between things that were not necessarily obvious. Technology helps us find new patterns by collecting data and analyzing how relevant they are. For example, an initiative, called Linked Open Data, is connecting all the data published on the web by world-wide organizations. To make the internet a global-scale database for everyone, Fujitsu and other international research institutions are shaping an ecosystem, collaborating to develop technologies to instantly draw relevancy among diverse data and implied meanings.

When people and technology are working together in this way, what kind of technology infrastructure should we have? So far, ICT systems have been arranged around physical assets. Computers and data centers sit in the center and users in the periphery, connected via networks. It is a computer centric and network centric world. However, as an enormous number of people stream videos and billions of things are generating data in a hyperconnected world, this kind of architecture will no longer be adequate.

Fujitsu believes that technology infrastructure must put us (people) in the center. To enhance our experience, computing power currently residing in the distant cloud data centers will come our nearby. Data will be processed, stored at our proximity, and intelligent computing will support us with the awareness of our immediate contexts. This will be enabled by network-wide distributed computing. The entirety of computing, wide-area networking and mobile devices will be abstracted and controlled by intelligent software.

Responsible Business

As you can see from these stories and our portfolio, we are now well positioned to deliver our vision. People can use the power of ICT to build a Human Centric Intelligent Society. This is a safer, more prosperous and sustainable world.

We continue to face serious challenges everywhere in the world. The world population has surpassed 7 billion and continues to grow. We are seeing aging of the population in developed nations and more urbanization especially in developing nations. These factors lead to significant challenges in the areas of food supply, water, transport management, education, healthcare, disaster mitigation, energy and environmental protection. For example, climate change is a significant risk for all people and creating a low-carbon sustainable society is a desirable

objective.

Fujitsu strongly believes that ICT can take a leading role in addressing these global challenges. Aligning our business activities to this goal of achieving common good is not just our aim but our obligation.

Human Centric Intelligent Society is a journey, and we can reach the destination by co-creating greater value for people through shaping digital ecosystems together.

FUJITSU LIMITED

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

A Note Concerning Future Projections, Forecasts and Plans
This publication contains forward-looking statements in addition to statements of fact regarding the Fujitsu Group's past and current situation. These forward-looking statements are based on information available at the time of publication and thus contain uncertainties. Therefore, the actual results of future business activities and future events could differ from the forward-looking statements shown in this publication. Please be advised that the Fujitsu Group shall bear no responsibility for any of these differences.

Consideration for the Environment
- This report has been printed using waterless printing, which reduces the amount of harmful materials used and emitted.
- It is printed on FSC® Certified Paper as designated by the Forest Stewardship Council® in order to help preserve forestry resources.
- It uses vegetable oil inks that do not include volatile organic compounds.

July, 2015
Printed in Japan
FV0024-3