Trust and Co-creation in the Digital Era

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FY2018 R&D Strategy Briefing

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Fujitsu Laboratories was founded for developing the world’s top-level technologies to drive the growth of the Fujitsu Group, in the autonomous and free atmosphere for researchers with broad consideration on what research and development ought to be.
Fujitsu as a Technology Company

To resolve societal issues and bring happiness to the people around the world
Announced in 1976

Reliability and Creativity
Transition of Reliability and Creativity

1950- : Assaulting expansion of Computer Business
Acceleration of rapid growth in Japanese economy through promoting computing business

1976- : Leading ICT business under the slogan of “Reliability and Creativity”
With mainframes as a starter, providing leading-edge, highly-reliable products/services to develop new ICT markets

2010- : Driving sustainable development of society and economy in the digital era
- Ensuring “Trust” in the hyperconnected society / economy
- Propelling Co-creation to generate persistent innovations
- Contributing to achieve SDGs for realization of sustainable and resilient society
Changes in ICT’s Role

- **Generating Innovations**
  - Enhance and expand the customers’ core business
  - Create new business (Specific field → Extensive fields: SCM, LCM, BCM)

- **Resolving Societal Issues**
  - Reliability and Creativity for High Quality of Life
  - Contribution to SDGs

- **Business Efficiency**
  - Customers’ information systems
Changes in the Digital Era

- In the connected world, the number of elements concerning in combinations among company, people, business, data and system is extremely high, resulting in structures with "complexity" and "immensity".

"Complexity"  "Immensity"

- Through realization of the world that ensures "Trust," a huge number of elements which configure complex combination sets are to be connected more easily, accelerating "Co-creation".
Trust and Co-creation in the Digital Era

Reliability → Trust → Co-creation

Creativity
R&D Strategy

Generating innovations through Trust and Co-creation in the digital era and promoting societal and economic development

Trust:
Develop safe and secure cutting-edge technologies to create “Trust” in society and customers business environment

Co-creation:
Enhance and expand the customers’ core business for mutual growth through cutting-edge technologies
Values created through Trust of the Digital Era

- Privacy Protection
- Big Data Utilization
- Work Style
- Corporate Growth / Development
- Rule Revision
- Social Infrastructure Maintenance
- Data Portability
- Data Business
- SDGs
- Brand Promotion
- Co-creation Business
- De facto Standard
- Business Continuity
- AI Social Implementation

Cross-Industry

Governance

Business

Compliance

Contract

Social Responsibility

Personal Authentication

Risk Management

Information Ethics and Morality

Data Traceability Management

Transparency

GDPR

Data

Cyber Security

Explainability

Anonymization / Concealing

Robustness / Availability

System

People

Company A

Company B

Company C

Company D

Individual

Public

Data

System

Rule / Regulation

Accountability

Trust

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Trust can be easily damaged even by slightest misconduct
Achievement of Trust by Technologies

- Privacy Protection
- Big Data Utilization
- Work Style
- Corporate Growth / Development
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- Social Infrastructure Maintenance
- Data Portability
- Data Business
- SDGs
- Brand Promotion
- Co-creation Business
- De facto Standard
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- AI Social Implementation

**Borderless IoT Security**
User / Data traceability assurance

**Chained Lineage**
Realizing trustworthy, safe and secure distributed data exchange

**Dataffinic Computing**
Distributed processing of ever-increasing massive data

**New Market Development**
Creating trustworthy values by digital technologies

**Digital Annealer**
All combinatorial problems solved completely with high-speed and accurately

**Connecting-X**
Network to deliver a real-time UX with high security

**Explainable AI**
AI that is reliable, understandable and controllable to human
Co-creation through Technologies

- Co-creation beyond the relationship of IT vendor

Customers

- Core Business Experts
- Cutting-edge Technologies Experts

Issues of Core Business

- Enhancement of Customer’s Core Business
- Creation of new business
- Solution for Societal Issues

Societal Issues

Fujitsu Competence

- ICT
- System Integration
- Computing
- AI • Communication • Control
- Signal Processing
- Knowledge Processing
- Natural Language Processing
- Mathematics
- Physics/Chemistry
- Legal • Economy, etc.
Strategy of mutual growth with customers

- Exploit new market with digital technology and high-value business model

Customer's customer

- Eco-system
- LCM • SCM • BCM

Peer Customers

Core Business

Digital Technologies and Services

Peer Customers

Core Business

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LCM: Life Cycle Management
SCM: Supply Chain Management
BCM: Business Continuity Management

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Digital Co-creation Use Cases

SIEMENS Gamesa

Manual inspection focusing only on the parts with possible defects detected by AI reduced the inspection time by 80%

Hospital Clinico San Carlos

Analysis of patient's medical interview chart/medical record

Presumption of disease for the next hospital visit

Diagnostic Support for Medical Specialists

Mitsui O.S.K. Lines Ube Shipping & Logistics

Great Circle Route (Shortest Route)

Recommended Route

Fuel Consumption / CO₂ Reduction

Social Infrastructure Inspection
Open Innovation

Kyoto University
"Explainable AI"
Integrated Database for Genomic Analysis

Toronto University
"Digital Annealer"
Advanced Cancer Treatment

MITSUBISHI ESTATE CO., LTD.
SoftBank Corp., and
The University of Tokyo
"Blockchain"
Field trial of new service creation and urban development based on data utilization platform

A large number of academic articles and knowledge DBs scattered around the world

Source: National cancer research center
https://ganjoho.jp/public/dia_tre/treatment/radiotherapy/rt_03.html

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Fujitsu’s R&D Strategy:
Developing Cutting-Edge Technologies for Promotion of the Growth in Customers’ Trustworthy Business through Co-creation in the Digital Era
Digital Annealer

- Finding the best combination from a huge number of combinatorial elements with high speed and accuracy
- Improved efficiency in drug discovery informatics
- Shortest route selection for goods delivery and alleviate traffic congestion
- Productivity enhancement by task schedule optimization

Technologies

- Inter-bit Full Connection
- Route Search

Target Markets “Potential Markets”

- Materials Informatics
  Chemistry, Battery, Magnetics, Ceramics, Materials and Devices Analysis, etc.
- Medical care
  Drug Discovery, Advanced Cancer Treatment, Tailor-made Medical Care, etc.
- Route Optimization
  Delivery Route, Traffic line “Work Schedule”, Congestion Forecast, etc.
Explainable AI

- AI that is reliable, understandable and controllable to human
- Innovating cancer treatment by inferring the disease from genetic mutation
- Forecasting the corporate growth rate from past results and economic indicators
- Work style reform based on expected changes in employees' health from daily activity data
Connecting-X

- Network for delivering a real-time UX with high security
- Real-time digital twin for processing large amounts of IoT stream data
- Collecting / Analyzing the data from connected cars and feeding the required data back to users in real time
- Optical fiber network for connecting data centers securely to transmit large-capacity data

Technologies

- **Connected Cars**
- **Datacenter**
- **Gateway**
- **Stream processing**
- **Connected system**
- **Dracena**

Target Markets “World Wide”

- **IoT**
  - Connected-car
  - 5th Generation
  - Dracena
- **Optical Network**
  - Datacenter Network
  - Backbone Network
- **Manufacturing**
  - Factory Automation


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Borderless IoT Security

- User / Data traceability assurance
- Data trail management by blockchain and history records
- Personal data concealing / anonymization for secure utilization
- Highly reliable privacy protection by palm vein authentication

Technologies

Target Markets “World Wide”

- Cyber Security
  - Forensics technology
- Blockchain
  - Connection Chain
  - VPX
- Authentication / Authorization
  - Palm Vein Authentication
- Data Security
  - GDPR


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New Market Development

- Creating trustworthy values by utilizing digital technologies
- Scoring support by 3D sensing that revolutionizes the world of sports
- Sensecomputing to analyze human psychology by sensing data
- Integrated surveillance for facilities by optical fiber sensing

Target Markets “Potential Markets”

- **Athlete Sensing**
  Gymnastic scoring support, Application for Training, Healthcare "Rehabilitation", Entertainment "Commercial/Movie Production"
- **Sensecomputing**
  Sensitivity Digital Marketing, Work Style Reform
- **Facility Surveillance**
  Temperature measurement by Optical Fiber, Deterioration predicting solution
Exhibits: Fujitsu Laboratories’ 8 Emerging Technologies for Leading the World with Trust

- Innovative Computing Solving Social Issues
- Reliable AI that Develops the Society
- Data Management System that Facilitates the Value Creation Cycle
- Information and Communication Management in the 5G Era for Connecting Cyberspace and Physical World
- System Engineering Supporting Digital Co-creation
- Digital Security Systems Protecting Society from Potential Threats
- Sensecomputing for Human-Machine Collaboration through Human Emotion Understanding
- New Materials/ Devices that Revolutionize the Existing Paradigm

Innovative Computing Solving Social Issues
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New Press Release

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信頼と創造の富士通

Reliability and Creativity
In the Digital Era

Trust and Co-creation

信頼と創造の富士通