Leading-edge Technology Innovation from Fujitsu Laboratories

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Life on earth

12,742 km → 1 m

10~20 km → 1~2 mm

Thermosphere

Stratosphere
50 km → 5 mm

Ozone layer

Troposphere

Surface of the earth

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The Earth is Alive

Extreme Weather Patterns

Global Warming

Unforeseen Natural Disasters
Progress of Civilization, Negative Legacy

Environmental Pollution

Deforestation, Increased Carbon Footprint (CO₂)

Deteriorating Structures
Global-scale Inter-related Issues

Food and Water Supply, Sanitation

Refugee Issues

Inter-related Issues
Bringing People and ICT Together

Human-Centric Intelligent Society

Dramatic Growth and Development of ICT

ICT that Anyone Can Use ICT-related Risks

ICT Supporting People’s Activities Socially Useful ICT
Fujitsu Technology and Service Vision

Bringing about a “Human-Centric Intelligent Society”

Fujitsu’s 3 Actions

1. Create Innovation through People’s Activities
2. Power Business and Society with Information
3. Optimize ICT Systems from End to End

Common Foundation
Technological capabilities, quality and reliability, eco-friendliness

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Support the Fujitsu Group’s growth by leveraging leading-edge technologies.
R&D: Core Strategic Domains

Fujitsu’s Business

Create Innovation through People’s Activities

Power Business and Society with Information

Optimize ICT Systems from End to End

Common Foundation

Business-Strategic Themes

Core Strategic Domains

Ubiquitous Innovation

Social Innovation

ICT Innovation

Manufacturing Innovation

Seeds-Oriented Themes

Existing Businesses

New Businesses

New Markets

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# Ubiquitous Innovation

## Developing front-end ICT that is closely integrated into users’ lives

<table>
<thead>
<tr>
<th>Stores, classrooms, medical offices</th>
<th>Factories, hospitals, automobiles</th>
<th>Facilities, offices, on-the-go</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interfacing with People</strong></td>
<td><strong>Interfacing with Things</strong></td>
<td><strong>System Compatibility</strong></td>
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</tbody>
</table>

## Gateway layer
- Accelerating front-end transformation by rapidly developing service environments that meet on-site needs

## Back-end layer
- Creating value by linking front-end systems with mission-critical systems
- Creating value by processing massive volumes of data, especially media data

## Equipping people with ICT
- Empowering people through front-end systems

## Equipping the environment with ICT
- Promoting the utilization of physical information via sensing

**Next-gen UI, Wearable, Power-conserving, Sensing, Image/Sound/Language Processing, HTML5, IoT**

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Social Innovation
Connecting and utilizing heterogeneous data to offer societal services

**Safe & Comfortable Society**
- Societal infrastructure
  - Mobility, disaster mitigation, Security

**Decision-making Support**
- Lifestyle innovation
  - Health, education, HR dev., food, agriculture

**Low Environmental Impact**
- Environment and energy
  - Smart cities, water supply, biodiversity

### Data usage
- Secure data processing methods
  - Algorithm development
- Privacy protection, ID mgmt

### Societal system transformation
- Create social systems with consideration to policies, laws, and people’s emotions
- Forecasting, optimization, simulation

### Data collection/inter-relation
- Connecting massive sets of heterogeneous data
- Ascertain significance of data, curate/integrate data formats, and integrate data into meaningful patterns
ICT Innovation

Software control of all ICT to support on-demand customer innovation

- **Core operations**
- **Big data**
- **Social platforms**
- **M2M**

Offering Infrastructure Services

- **Datacenter, WAN, front-end**

Eliminating Complexity in ICT Systems

- **Integrated ICT platforms**

Anticipating Customer Needs

- **Proactive datacenters**

**Cloud**

- Integrating datacenters, networks and front-end devices through SDN
- Unified distributed service platform for leveraging value in data

**Support & Services**

- Proposing customer value from observation data
- Big data utilization service
- Delivering just-in-time features and services

**Products**

- Servers: Flexible platforms
- Storage: Supporting data characteristics, value changes
- Networks: Rapid access to resources throughout the world from anywhere

Pursuing ease-of-use while enabling flexible customization based on customer needs

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Manufacturing Innovation
Manufacturing Innovation

Supporting Fujitsu’s manufacturing for enhanced ICT value

- Ubiquitous devices
- HPC/ Servers
- Packaging/ Chips
- Software

Greater Efficiencies in Manufacturing & Development

Quality Control

Cultivating Leading-edge IP

Virtual design, rapid prototyping, software manufacturing, hardware manufacturing

Development process innovation
- Simulation-based design/ testing
- Rapid prototyping (using 3D printers)
- Manufacturing simulation

Service & solution development
- Consulting: Manufacturing leveraging ICT
- Data services: Utilizing manufacturing site data
- Outsourcing services: Using Fujitsu’s resources

New product creation
- Creating products that will lead to new services
- Developing key trigger technologies and IP

Enhanced product performance/ quality
- Production tools, advanced testing technology
- DevOps, software quality evaluation
Usage Scenarios

1. Create Innovation through People’s Activities
2. Power Business and Society with Information
3. Optimize ICT Systems from End to End

Common Foundation
Technological capabilities, quality and reliability, eco-friendliness

User Interface
- Pulse Measurement
- 3D Laser Sensor
- Video-mediated Communications
- etc.

LOD
- Analysis Scenarios
- DRA Server
- Data Aggregation
- etc.

Resource-pooling Architecture
- Data Transfer Methods
- Inter-CPU Data Communications
- 100 Gbps Optical Communications
- etc.

Ecomaterials
Device Integration
Software Map

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Fingertip Touch-based User Interface

- Enables easy data interaction by simply touching real-world objects with one’s fingers

Direct manipulation of real objects

Manipulation takes place in 3D space

High-accuracy extraction of finger contours

Predicts 3D positioning of fingertips

Simple scrapbooking

Brainstorming support

Manipulating 3D objects

Creates new ICT applications that assimilate into a real-world environment
Storage and Search Technology for Massive Volumes of Linked Open Data (LOD)  
*LOD: Linked Open Data

- Rapid searching of LOD link structures at 5 to 10x conventional speeds
- Bird’s-eye view of overall LOD enables intuitive searches

 LOD Utilization Platform (40 billion pieces )

New composite data services for various fields by incorporating enterprise IT systems

Search interface
  - No need to search individual websites

Standard API*
  - Simple processing
  - On-site IT Systems
    - Sale
    - Inventory
    - Customer support

*API: Application Programming Interface

Public data sites

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Resource Pool Architecture for On-demand Server Provision

- Implements a disk area network using high-speed interconnect technology, enabling on-demand configuration of physical servers

Resource Pool Architecture:
- Disk area network
- CPU/Memory pool
- Disk pool

User System:
- On-demand resource provision

User Network:
- Physical IaaS platform (Software Defined Server Platform)

Enables the efficient utilization of hardware resources, short-term deployments of high-performance servers
Generating Innovation through Advanced Technologies

Society’s Sustainable Growth: For a Prosperous Society in which People Can Live Safely and Securely
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