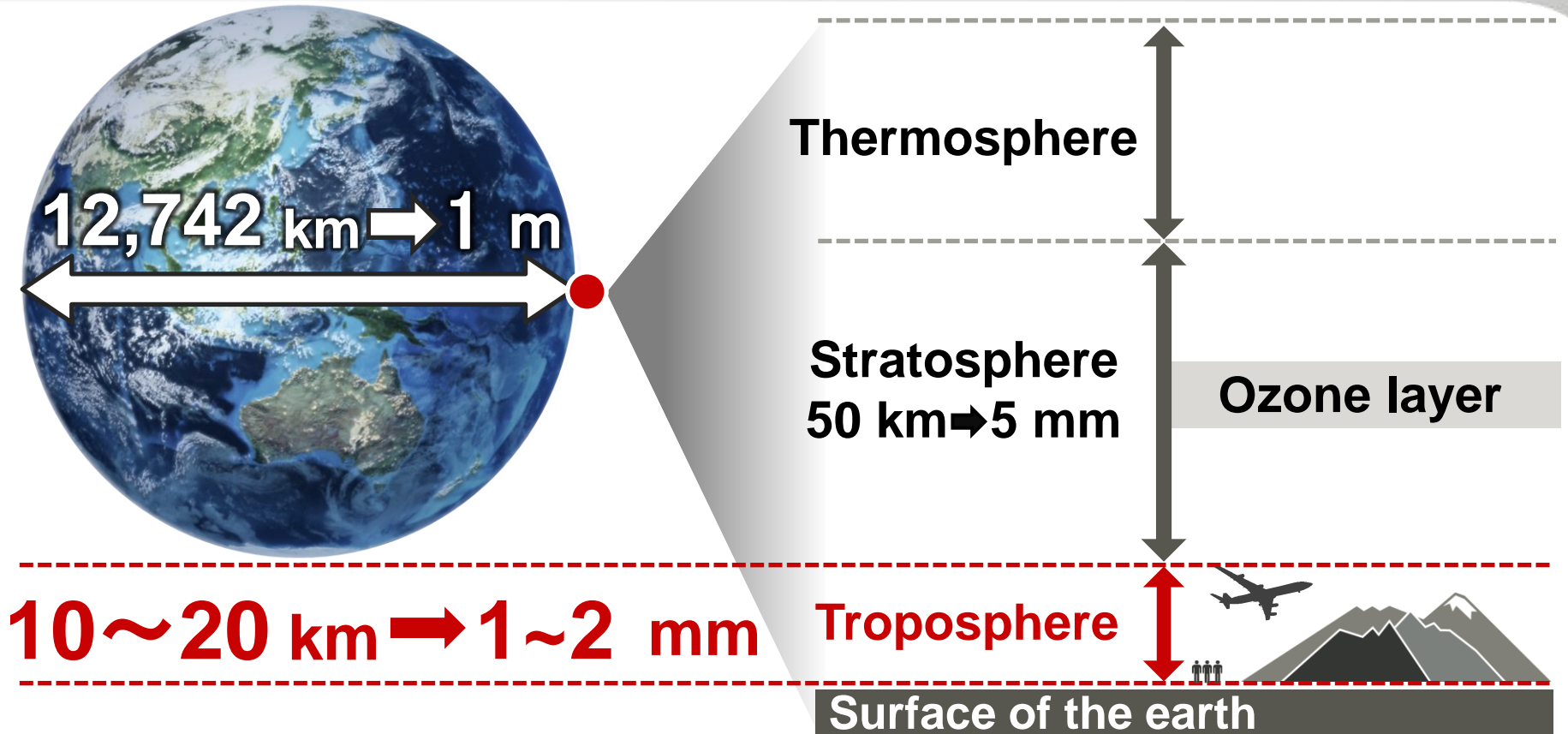FUJITSU

shaping tomorrow with you

Leading-edge Technology Innovation from Fujitsu Laboratories

January 22, 2014

Tatsuo Tomita
President
Fujitsu Laboratories Ltd.

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

The Earth is Alive

Extreme Weather Patterns

Global Warming

Unforeseen Natural Disasters

Progress of Civilization, Negative Legacy

Environmental Pollution

Deforestation, Increased Carbon Footprint (CO_2)

Deteriorating Structures

Global-scale Inter-related Issues

Food and Water Supply,
Sanitation

Refugee Issues

Inter-related Issues
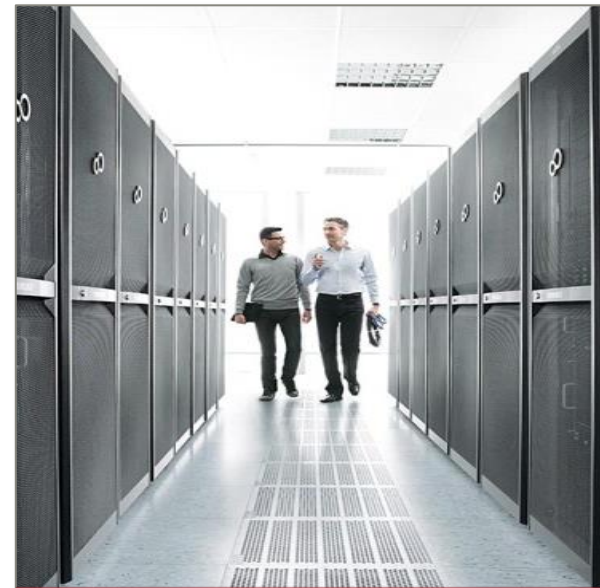
Bringing People and ICT Together

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"

1. Create Innovation through People's Activities

Fujitsu's 3 Actions

2. Power Business and Society with Information

3. Optimize ICT Systems from End to End

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

Fujitsu Laboratories: Mission

FUJITSU

- Support the Fujitsu Group's growth by leveraging leading-edge technologies

2013

Create Innovation through People's Activities

Power Business and Society with Information

Optimize ICT Systems from End to End

Common Foundation

2018

Contribute to growth of existing businesses

Continuous innovation for new businesses

2023

Breakthrough innovation toward cultivating new markets and businesses

Generate innovation through advanced technologies

R&D: Core Strategic Domains

Ubiquitous Innovation

Ubiquitous Innovation

FUJITSU
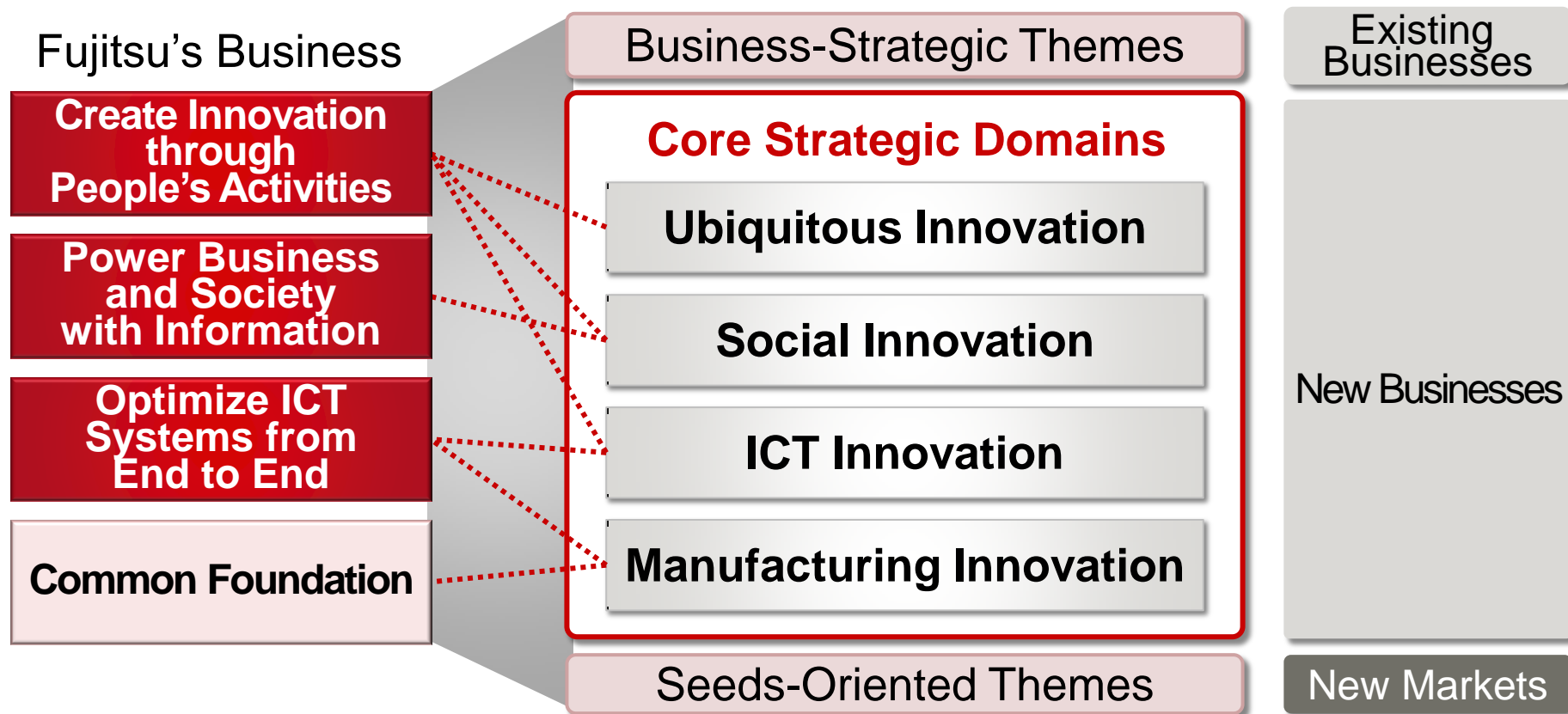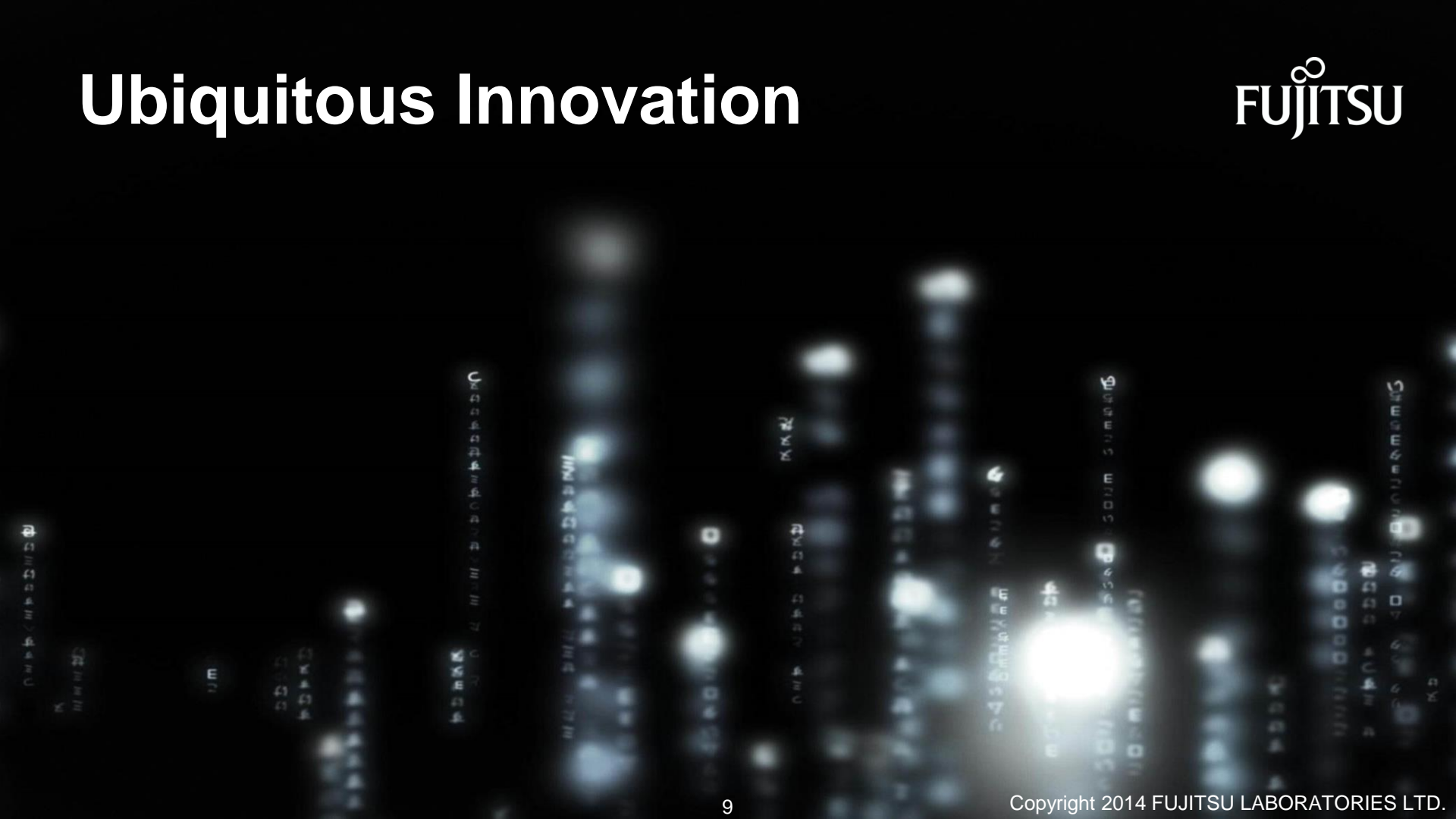
Developing front-end ICT that is closely integrated into users' lives

Finance	Logistics/ Distribution	Education	Medicine

Stores, classrooms, medical offices

Factories, hospitals, automobiles

Facilities, offices, on-the-go

Interfacing with People **Interfacing with Things** **System Compatibility**

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

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

Equipping people with ICT

Empowering people through front-end systems

Equipping the environment with ICT

Promoting the utilization of physical information via sensing

Social Innovation

Social Innovation

Connecting and utilizing heterogeneous data to offer societal services

Government (Open Data)	Business	Individuals	Environment/Society (Sensors)
Statistics, geography	Orders, accounting	SNS, life logs	Weather, traffic

Safe & Comfortable Society	Decision-making Support	Low Environmental Impact
Societal infrastructure	**Lifestyle innovation**	**Environment and energy**
Mobility, disaster mitigation, Security	Health, education, HR dev., food, agriculture	Smart cities, water supply, biodiversity

Data usage	Secure data processing methods	**Societal system transformation**	Create social systems with consideration to policies, laws, and people's emotions
	Algorithm development		
	Privacy protection, ID mgmt		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

ICT Innovation

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

Core operations	Big data	Social platforms	M2M

Offering Infrastructure Services	Eliminating Complexity in ICT Systems	Anticipating Customer Needs
Datacenter, WAN、front-end	Integrated ICT platforms	Proactive datacenters

Cloud	Integrating datacenters, networks and front-end devices through SDN	Support & Services	Proposing customer value from observation data Big data utilization service
	Unified distributed service platform for leveraging value in data		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

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

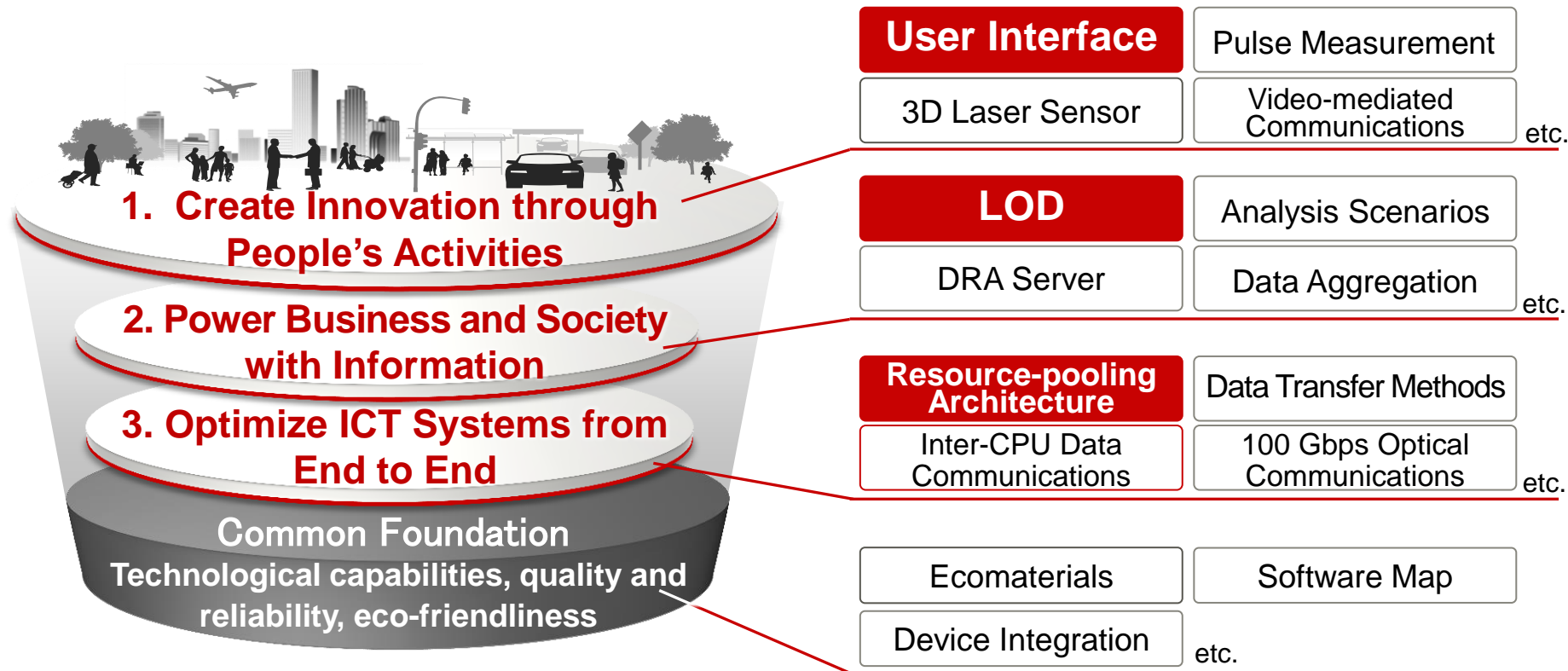| Development process innovation	Service & solution development
■Simulation-based design/ testing ■Rapid prototyping (using 3D printers) ■Manufacturing simulation	■Consulting: Manufacturing leveraging ICT ■Data services: Utilizing manufacturing site data ■Outsourcing services：Using Fujitsu's resources
New product creation	**Enhanced product performance/ quality**
■Creating products that will lead to new services ■Developing key trigger technologies and IP	■Production tools, advanced testing technology ■DevOps, software quality evaluation

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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	Software Map
Device Integration	etc.

Fingertip Touch-based User Interface

FUJITSU

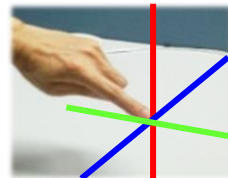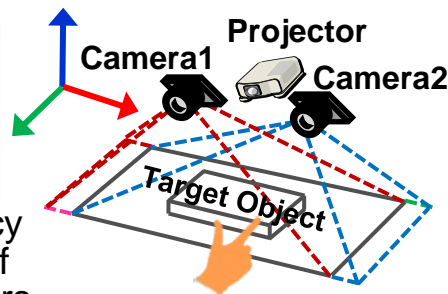- Enables easy data interaction by simply touching real-world objects with one's fingers

Direct manipulation of real objects
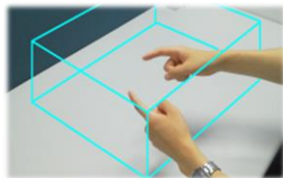
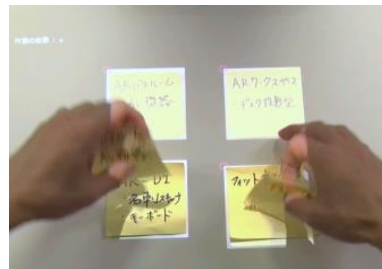
Manipulation takes place in 3D space

High-accuracy extraction of finger contours

Camera1   **Projector**   Camera2
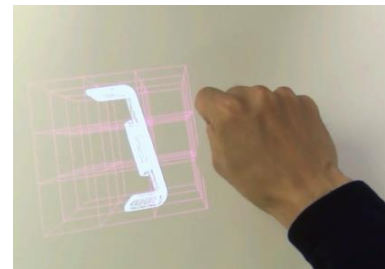**Target Object**
Predicts 3D positioning of fingertips
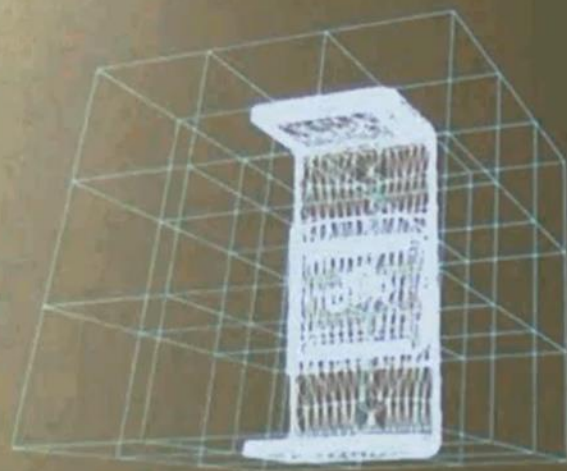

Simple scrapbooking

Brainstorming support

Manipulating 3D objects

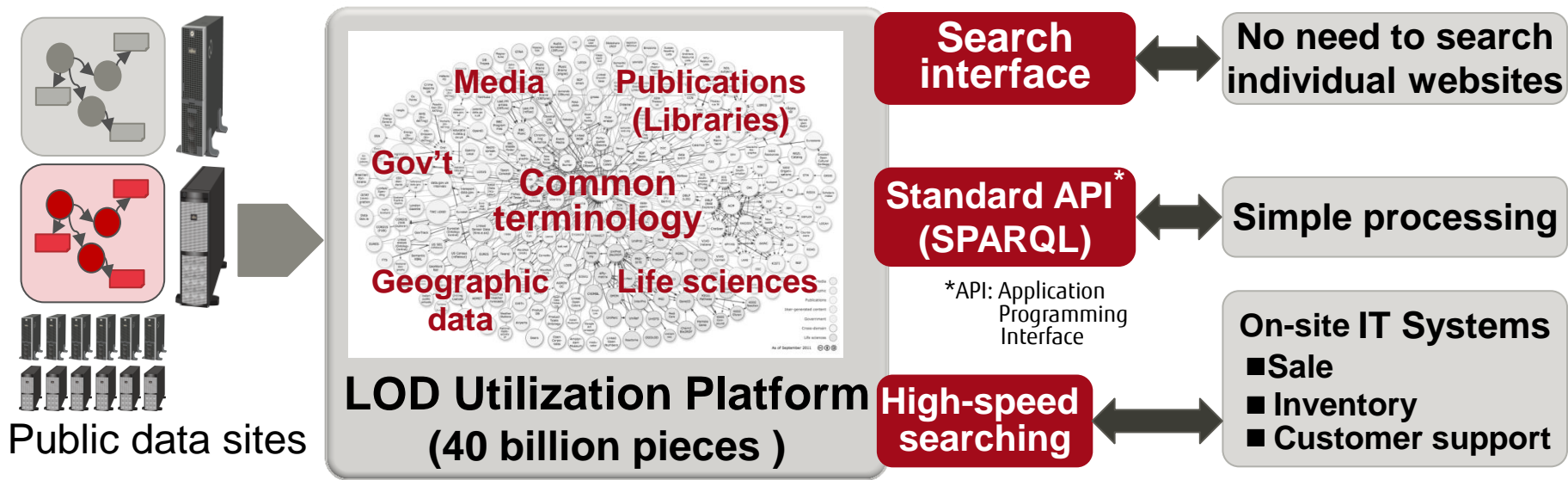Creates new ICT applications that assimilate into a real-world environment

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

Public data sites

LOD Utilization Platform (40 billion pieces)

Media
Publications (Libraries)
Gov't
Common terminology
Geographic data
Life sciences

Search interface ⟷ **No need to search individual websites**

Standard API* (SPARQL) ⟷ **Simple processing**

*API: Application Programming Interface

High-speed searching ⟷ **On-site IT Systems**
- Sale
- Inventory
- Customer support

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

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Filter by:

License Type:
None

Min. Size of Dataset
(# of triples):
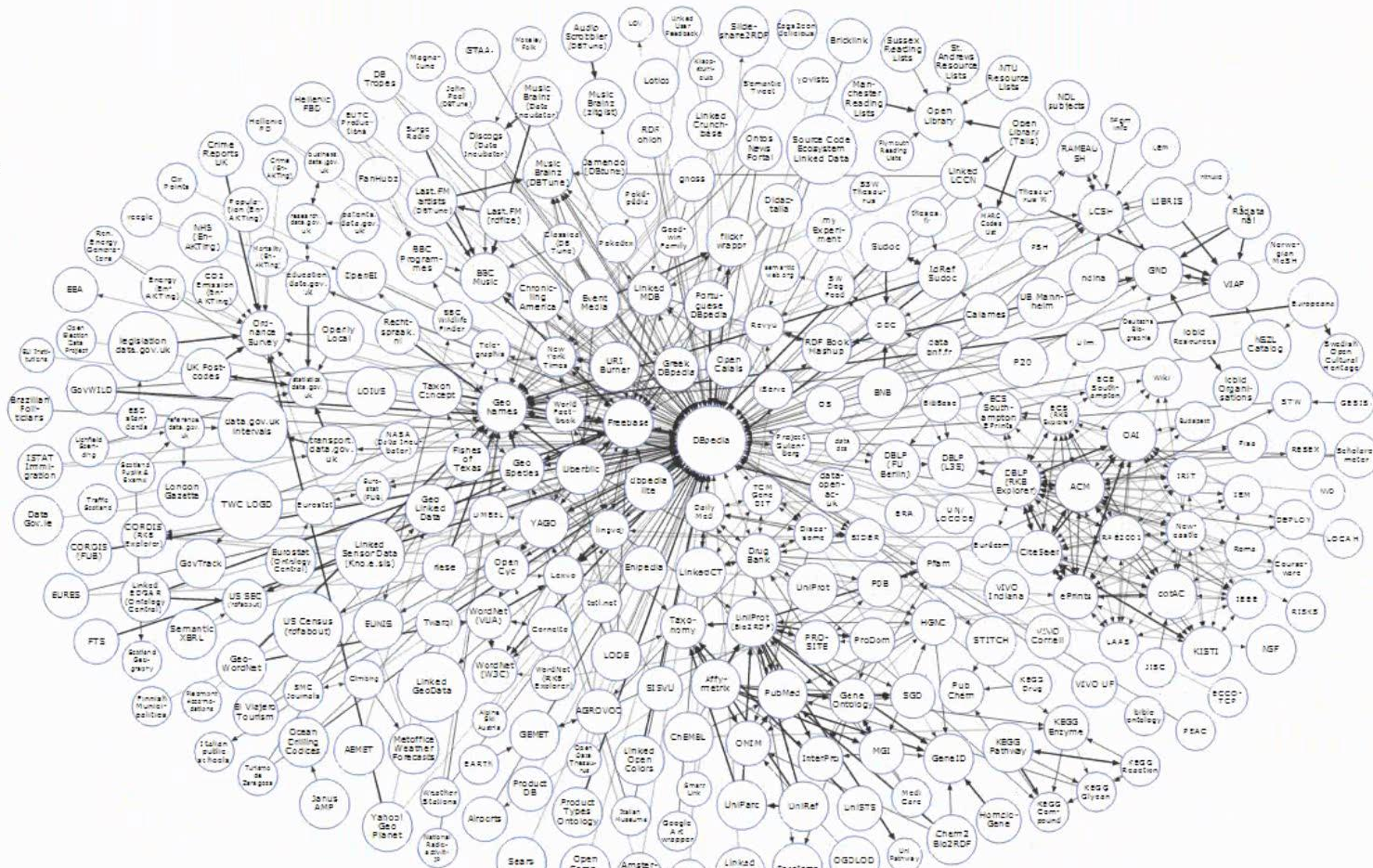
Max. Size of Dataset
(# of triples):
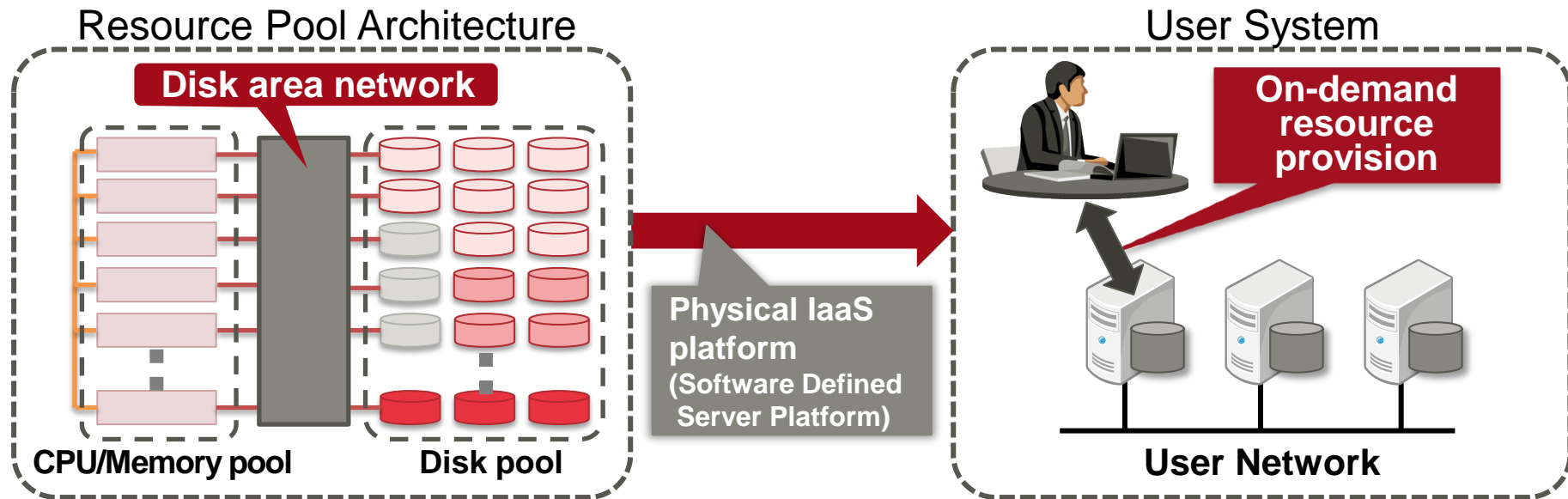
Title:

Apply Filter
or
List Results

Clear Filters

Or...

Search Structure

As of September 2011

Resource Pool Architecture for On-demand Server Provision

FUJITSU

■ 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

Physical IaaS platform (Software Defined Server Platform)

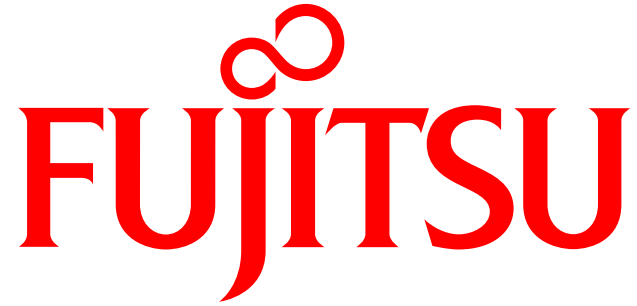User System

On-demand resource provision

User Network

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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FUJITSU

shaping tomorrow with you

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- rapid technological change, fluctuations in customer demand and intensifying price competition in the IT, telecommunications, and microelectronics markets in which Fujitsu competes;
- Fujitsu's ability to dispose of non-core businesses and related assets through strategic alliances and sales on commercially reasonable terms, and the effect of realization of losses which may result from such transactions;
- uncertainty as to Fujitsu's access to, or protection for, certain intellectual property rights;
- uncertainty as to the performance of Fujitsu's strategic business partners;
- declines in the market prices of Japanese and foreign equity securities held by Fujitsu which could cause Fujitsu to recognize significant losses in the value of its holdings and require Fujitsu to make significant additional contributions to its pension funds in order to make up shortfalls in minimum reserve requirements resulting from such declines;
- poor operating results, inability to access financing on commercially reasonable terms, insolvency or bankruptcy of Fujitsu's customers, any of which factors could adversely affect or preclude these customers' ability to timely pay accounts receivables owed to Fujitsu; and
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