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haping tomorrow with you

Fujitsu's Approach to Expanding Fields of ICT
~ *Focusing on Big Data* ~

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Presentation Overview
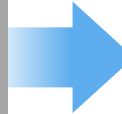
1. Fujitsu's Vision for Society

The Impact of ICT on Customer Products

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Medicine

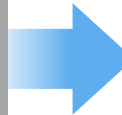Electronic medical records & insurance claims →

Health information analysis

Agriculture

Sales & distribution management →

Growing & picking better produce

Manufacturing

Production control →
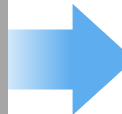
Usage analysis

Shift from information management systems to systems employed on-site

New Business Areas for Fujitsu
 - Data - Fourth Pillar

Hardware   SI   Services   Data

Creating Applications in New Domains

Customer Business Domains

New Domains

Existing domains

Operational data

New Products & Services
- Homes that promote healthy living
- Produce with high nutritional value
- ...

Sensing
- Social media
- Human activities
- Electricity usage
- ...

Synthesis

Planning ⟩ Production ⟩ Sales ⟩ ...

Existing business systems

Big Data

Data utilization platform
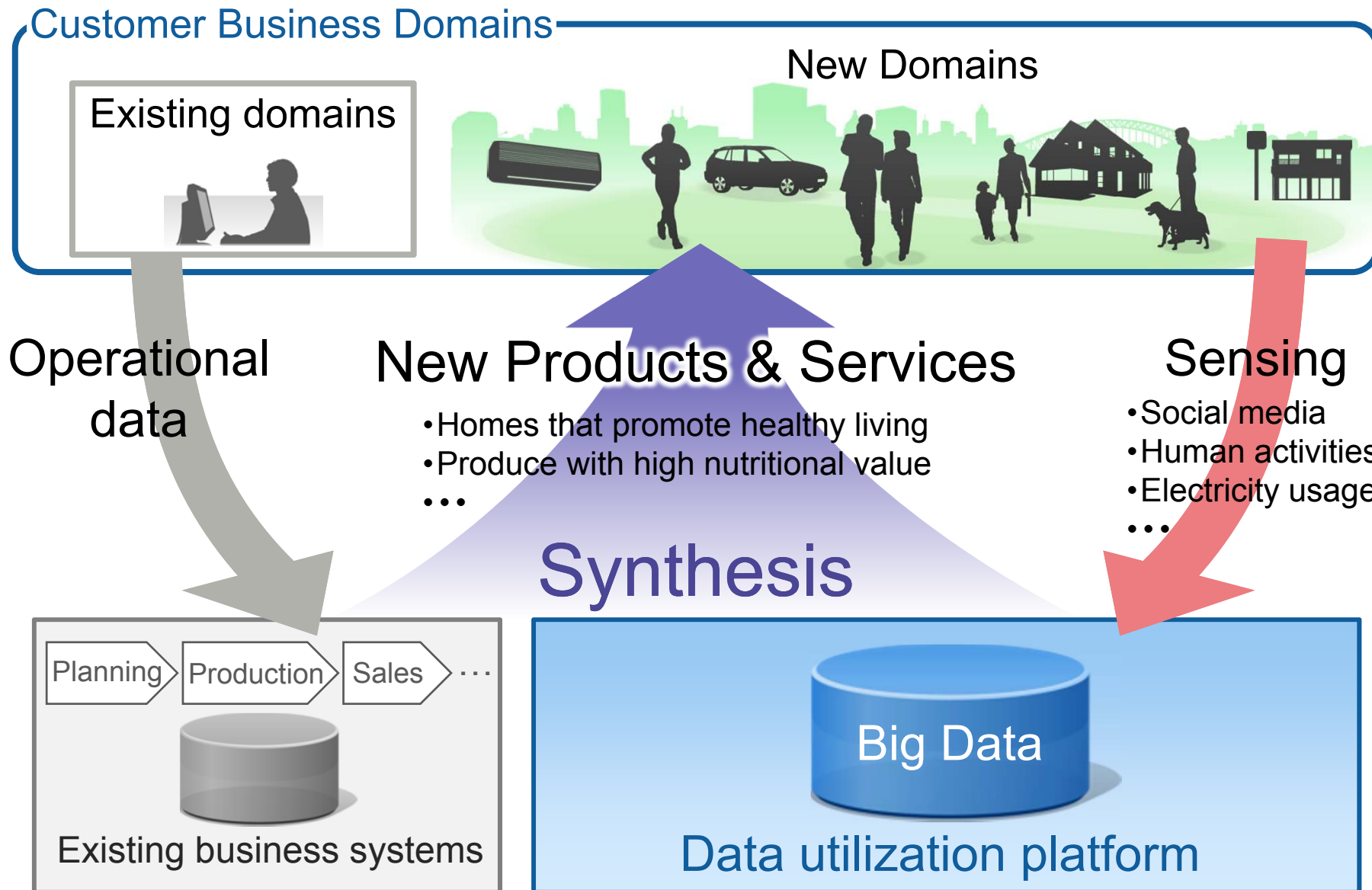
Businesses that Leverage Data

Two dimensions of enterprise data utilization

Level of data usage

Innovation
(Mid-long term, large scale)

Cross utilization

SI Business

Create new services

External data

Expand business opportunities

Internal data

Improve accuracy/ speed of current operations
- Transform processes
- Link to other systems

Services Business

Modernization
(Short- to mid-long term)

Enhancing business

Transforming business

Creating new business

Value to business

What is Big Data at Fujitsu?

In addition to general big data characteristics (the three "V"s), the fourth "V" (Value) is essential.

General Characteristics of Big Data (Three "V"s)

Volume
Petabyte- and zettabyte-scale data

Variety
Social media and other textual data, images, audio, sensor data, location data, log data, etc.

Velocity
Real-time and streaming data

Value

Big Data at Fujitsu
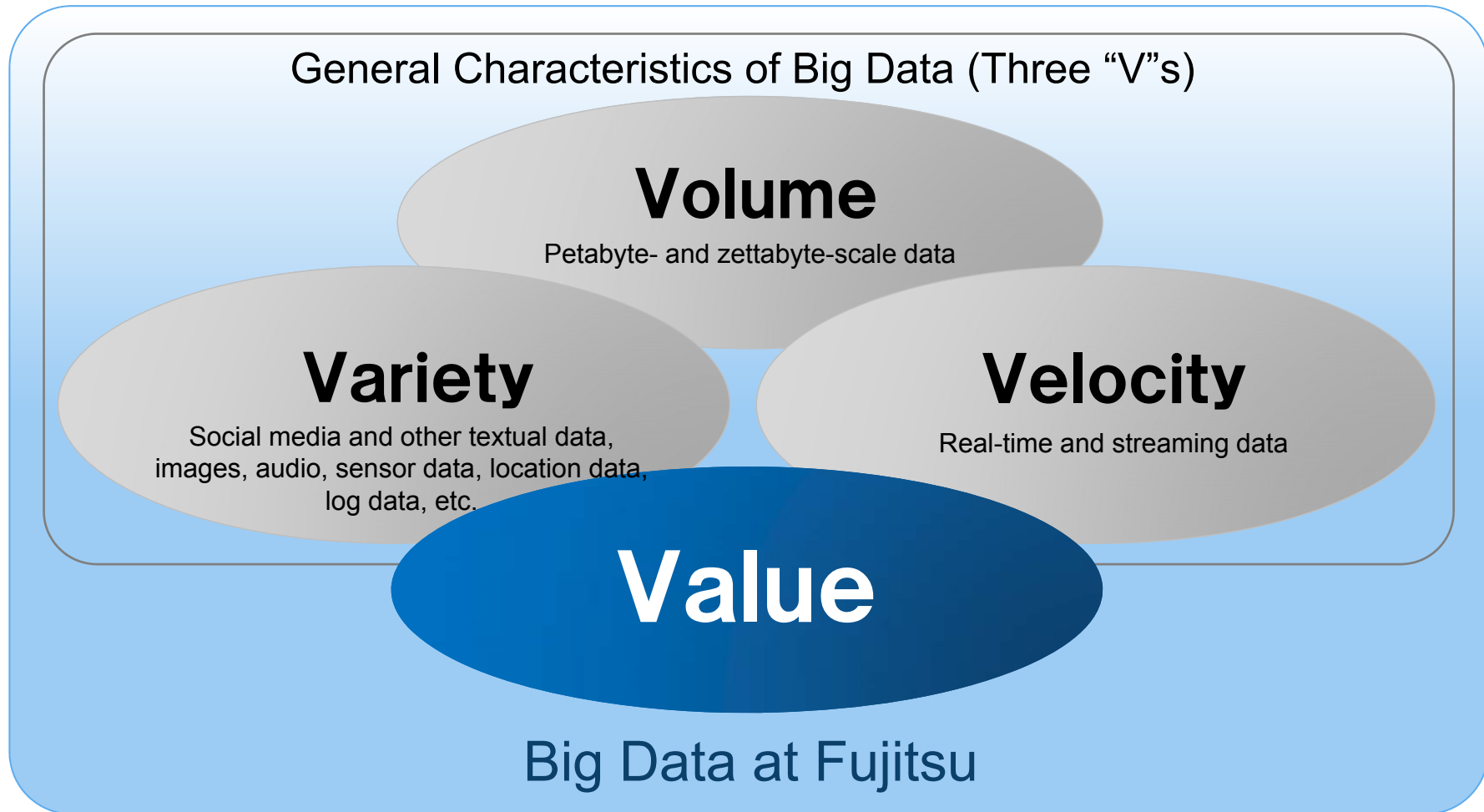
Creating new value from a variety of data to improve competitive strengths

2. The Value in Your Data

What is a Curator?

Fujitsu launched data curation services in April 2012.

"Let Data Talk"

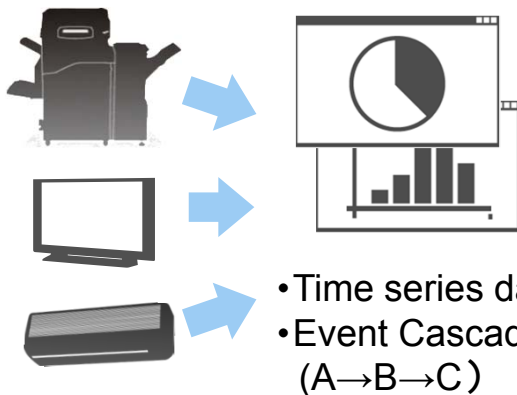- Mutual relation/causal relationship
- Event patterns
- Parameter optimization
- Forecast simulations
- Dynamic optimization, etc.

- Equations
- Forecast models
- Evaluation
- KPI, etc.

- Time series data
- Event Cascading
  (A→B→C)

Skillsets of Curator

Modeling
Mathematics, statistical, Financial Engineering, etc.

× W

Analytics
Multivariable analysis, machine learning, etc.

× W

System Design
Parallel Distributed Processing, CEP, etc

In January 2011, Fujitsu established a curator organization that consists of BI/BA experts, consultants, and analytic algorithm researchers

Approaches to Modeling & Analytics

By analyzing data from every direction without relying on preconceived ideas, it is possible to "make the data speak"

Conventional BI

Analysis based on hypothesis formed by operations specialist.
(hypothesis-verification approach)

Target search area set based on hypothesis

GOAL

Not searched

Not searched

START
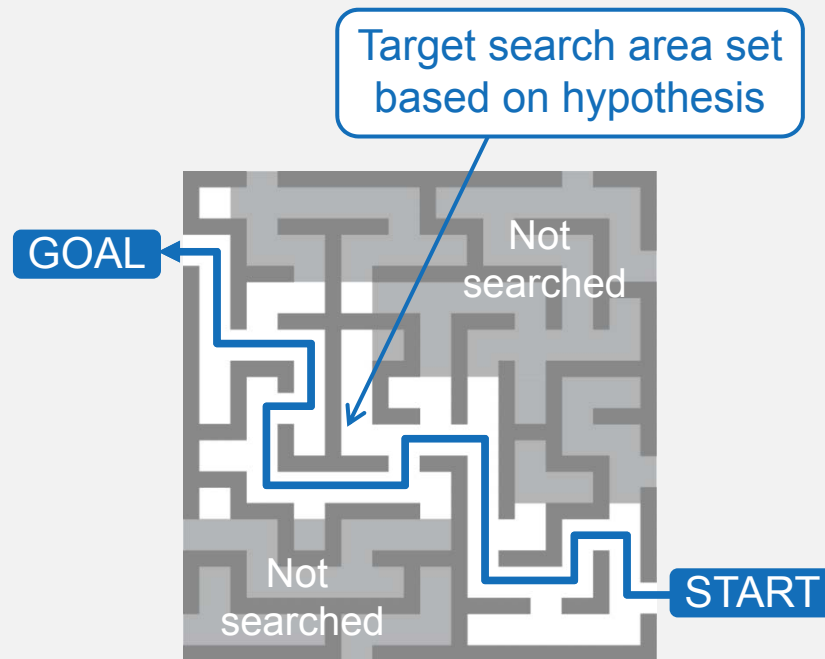
Data Curation

Performing multi-faceted analysis of data to derive multiple goals.
(data-driven approach)

GOAL

GOAL

GOAL

GOAL

START
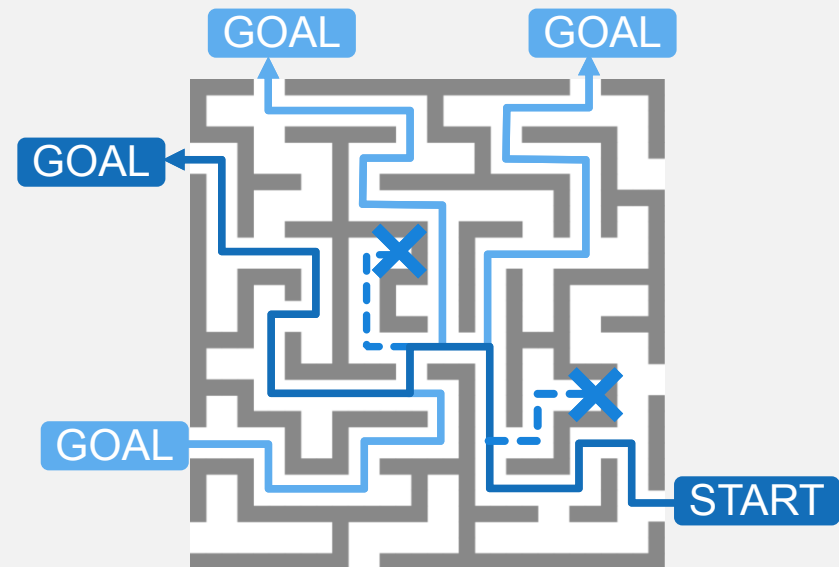
Data Categorization

When three pieces of data exist:
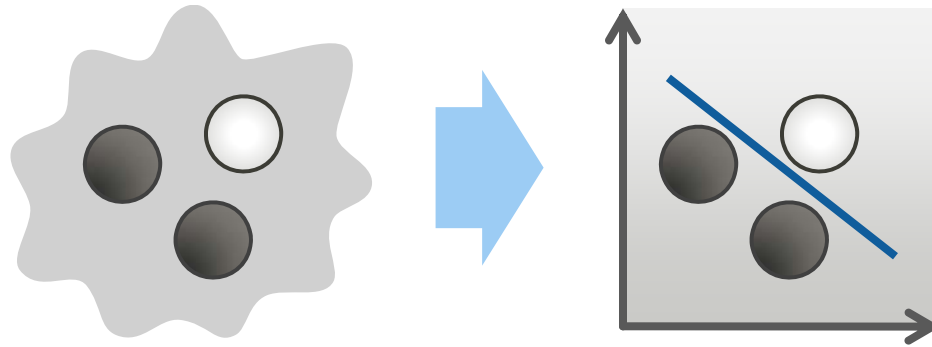
Data can be categorized using divider lines

When four pieces of data exist:
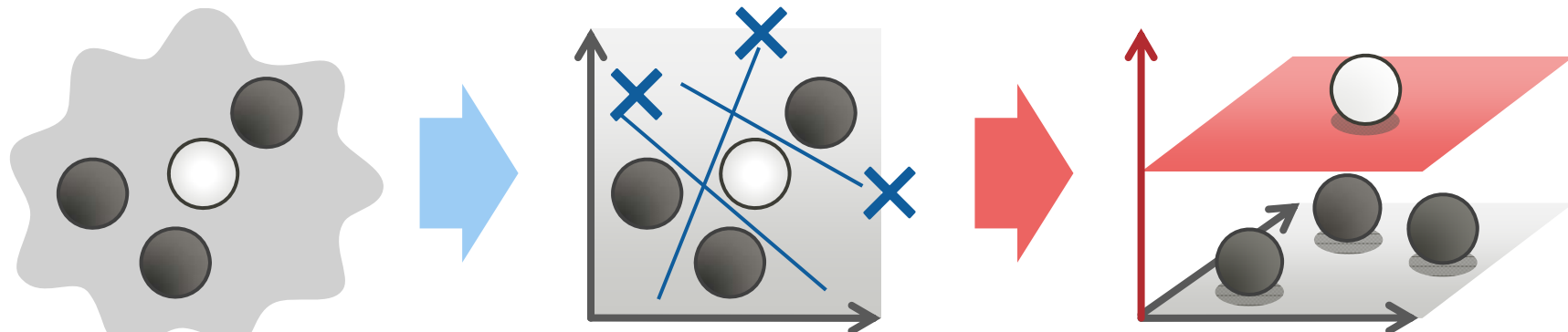
Data cannot readily be categorized using divider lines

By adding another dimension, data can be categorized using planes

3. Case Studies

Case Study: Multifunction Printer Manufacturer

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The company was able to analyze signs of errors and problems from massive volumes of sensing data gathered from multifunction printers, thereby enabling it to send customer service representatives to provide maintenance before the problems resulted in claims.

- Error notification
- Jam notification
- Alert notification
- Settings values
- No. of prints
- Printing jobs (color/mono, paper size, # pages, etc.)
- No. of consumables (toner, drums, etc.) used
- Temperature of each component (tens to hundreds)
- Current at each component (tens to hundreds)
- Voltage at each component (tens to hundreds)
- Operation of each component (tens to hundreds), etc.

Analysis

- Predicting the occurrence of specific errors, determining the conditions surrounding them

Curator
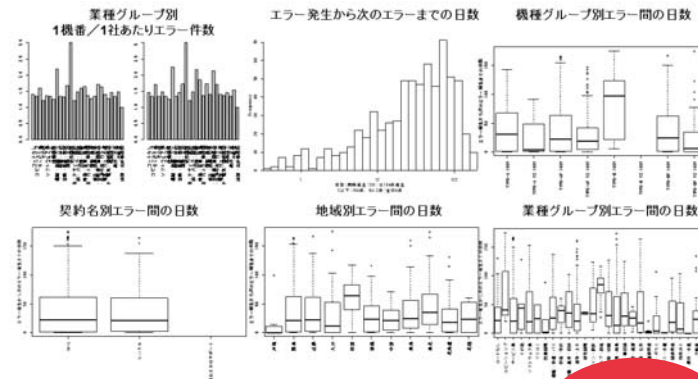
Signs of trouble

Data Utilization Platform Services (PaaS)

Maintenance performed before errors or problems occur

Service rep

Design & development

Case Study: Advanced Services for Subscriber Management

By performing integrated analysis on various data, including subscriber usage history, external data, and location information, new value can be generated in the area of subscriber services.

Subscriber A

Personal information
- Family structure
- Age, etc.

Usage History

External data
- Social media, etc.

Location data

Data Utilization Platform Services

Subscriber database

External data database

Location data database

Historical data

New member referral

Membership cancellation forecasting

Personalized recommendations

Marketing & PR
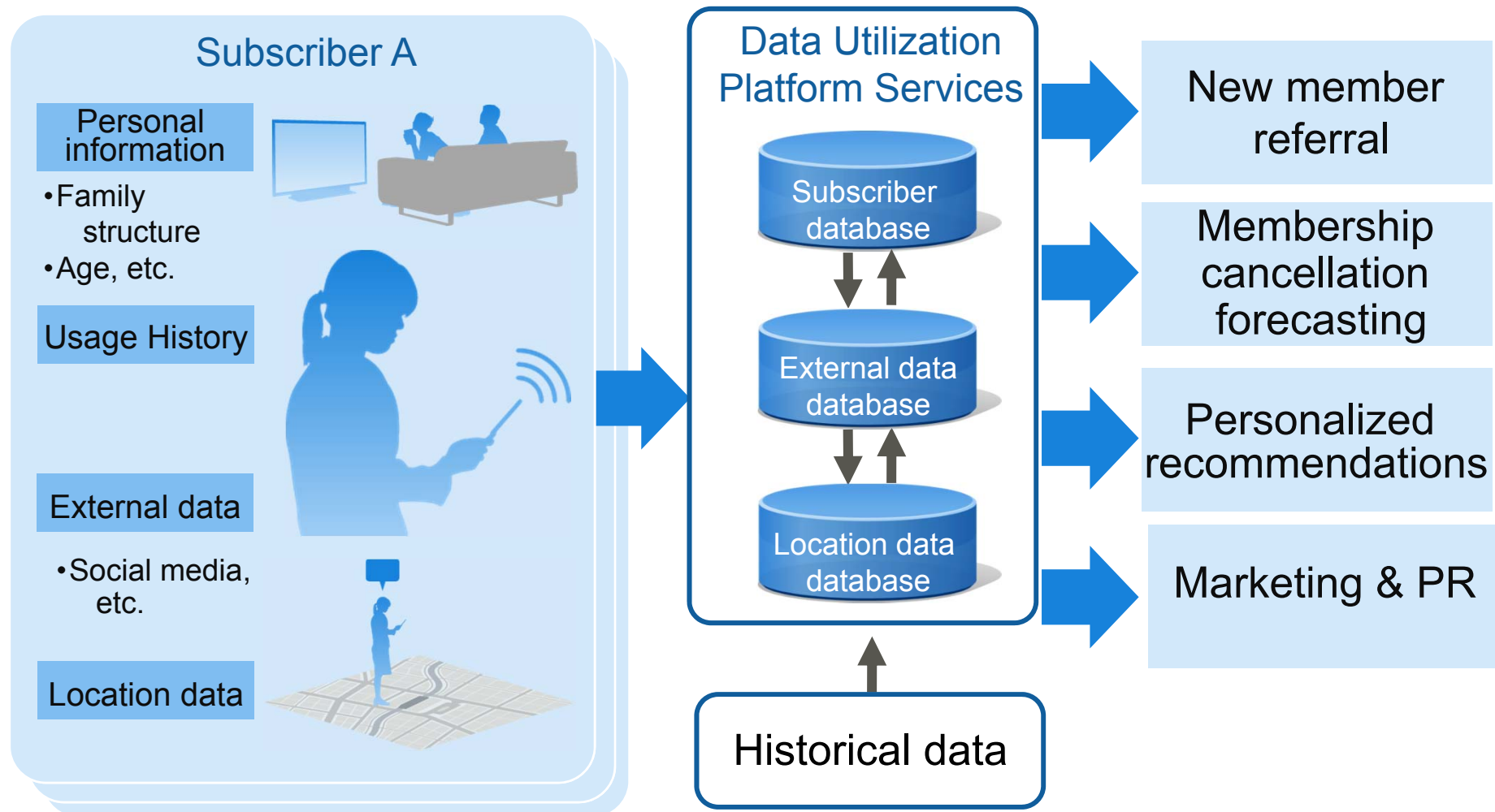
Leveraging Store Shelf Video to Check Stock Status and Assist with Ordering

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It is possible to determine shelf stock levels via image recognition technology, and appropriate alarms can be triggered using a variety of data, such as timetable and employee task data. This, in turn, can enable the development of a strategy leading to improved operational efficiency and increased sales (currently undergoing testing).

Store Shelves

- Shelf video
- Employee tasks
- Etc.

Data Utilization Platform Service

Data collection

Data analysis

Product sales performance

Shelf restocking frequency

The meat shelf is low on stock!

Triggers and sends alarm

Little movement on meat shelf for several days

Triggers and sends alarm

Store clerk

- Promptly restocks shelf

Ordering staff

- Efficient ordering
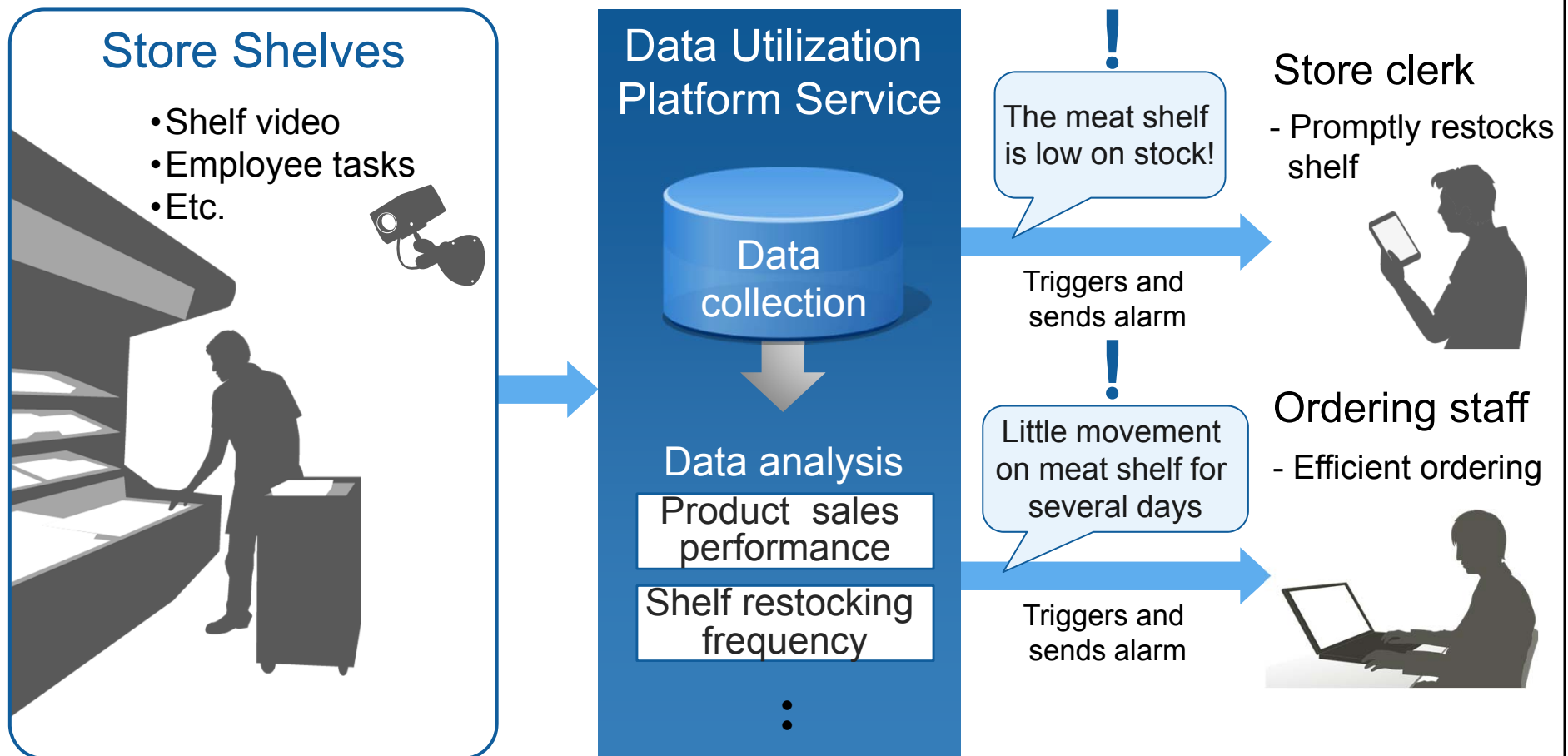
Analysis of Driving Data

Fujitsu has developed indices from actual driving data and vehicle/driver information, based on which it is exploring new services (currently undergoing testing).

Data collection

Analysis / evaluation areas

Eco-friendly driving

Vehicle malfunction forecasting

Safe driving

Data utilization study

Designing data and analysis models that will be useful and effective in implementing new services

Services for individual customers

Eco-friendly driving evaluation

Vehicle inspection advice

Driving diagnostics

Alliances with other industries and businesses

Automobile insurance

Car leasing

Used car appraisal

Strengthening Business through Alliances

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Press release from December 4, 2012:

Fujitsu Launches Big Data Service in Collaboration with Salesforce.com's Force.com

Salesforce.com   Fujitsu   Available Jan. 2013

Force.com	Data Utilization Platform Service
Platform for accelerating CRM and social media • Easy to use • High productivity	Cloud service for leveraging big data • Brings together all the technologies needed to use big data

×

Leverages the strengths of both companies' PaaS to deliver data aggregation, analysis, prediction and visualization

Case Study: Fujitsu and Salesforce.com Alliance

Salesforce.com (end users)

UI display

High productivity

- Current health information
- Recommendations
- Future predictions

Lifelog

Service data
(e.g. Hada Memory,
Karada Life, etc.)

Salesforce.com data
(subscriber info, etc.)

Fujitsu Data Utilization Platform Service

Fujitsu data

Analysis

Logic

Logic

Live chat

- Predictions
- Recommendations

Salesforce.com (sales)

Dashboard

High productivity

Service Cloud

4. Products Offered by Fujitsu

Overview of Fujitsu's Convergence Services

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Fujitsu's convergence services consist of platforms, applications and personnel.

Customer products/services

Integration-based

- Customer develops applications, or…
- Customer app. development contracted to Fujitsu

Undergoing testing

Application/Services-based (SaaS)

SPATIOWL
Location information service

Available

Hada Memory
Skin analysis service

Available

DataPlaza
Social media analysis tool

Available

...

Data-based

Data Curation Services

Available

Curator

Data Utilization Platform Service (PaaS) **Available**

Brings together all the technologies needed to process big data in real time and integrate, analyze and utilize it

Value center

Cloud platform

Networks

Sensors, etc.

Offering a PaaS for Big Data

1. Brings together all the necessary technologies

Complex event processing, parallel distributed processing, compressing/concealing, mesh maps, etc.

2. Employs heterogeneous data for multiple purposes

Sensor data, business transaction logs, text, binary streams, etc.

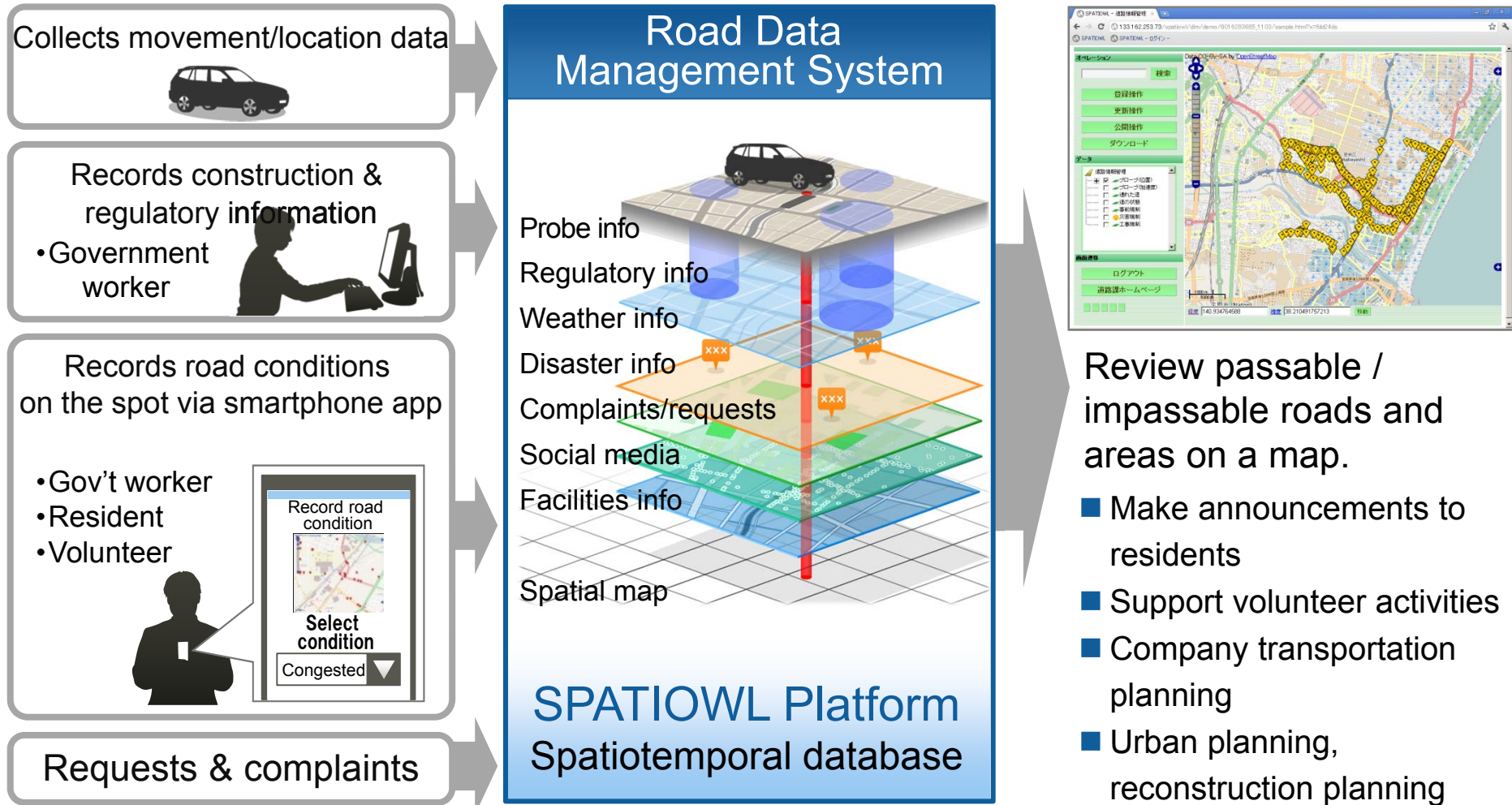## 3. Start small and use only what is needed

Data volumes: Gigabytes to petabytes; Servers: Few to hundreds

The world's first PaaS designed for big data
Data Utilization Platform Service

Delivering Social Infrastructure Information (SPATIOWL)

Gathers constantly changing road conditions in real time and provides information to area residents

Collects movement/location data

Records construction & regulatory information
- Government worker

Records road conditions on the spot via smartphone app
- Gov't worker
- Resident
- Volunteer

Record road condition

Select condition
Congested ▼

Requests & complaints

Road Data Management System

Probe info
Regulatory info
Weather info
Disaster info
Complaints/requests
Social media
Facilities info

Spatial map

SPATIOWL Platform
Spatiotemporal database

Review passable / impassable roads and areas on a map.

- Make announcements to residents
- Support volunteer activities
- Company transportation planning
- Urban planning, reconstruction planning

Automobile Service Cloud

Vehicle information system

Automobile Service Cloud

Services & content (existing)

SPATIOWL

Cloud service platform
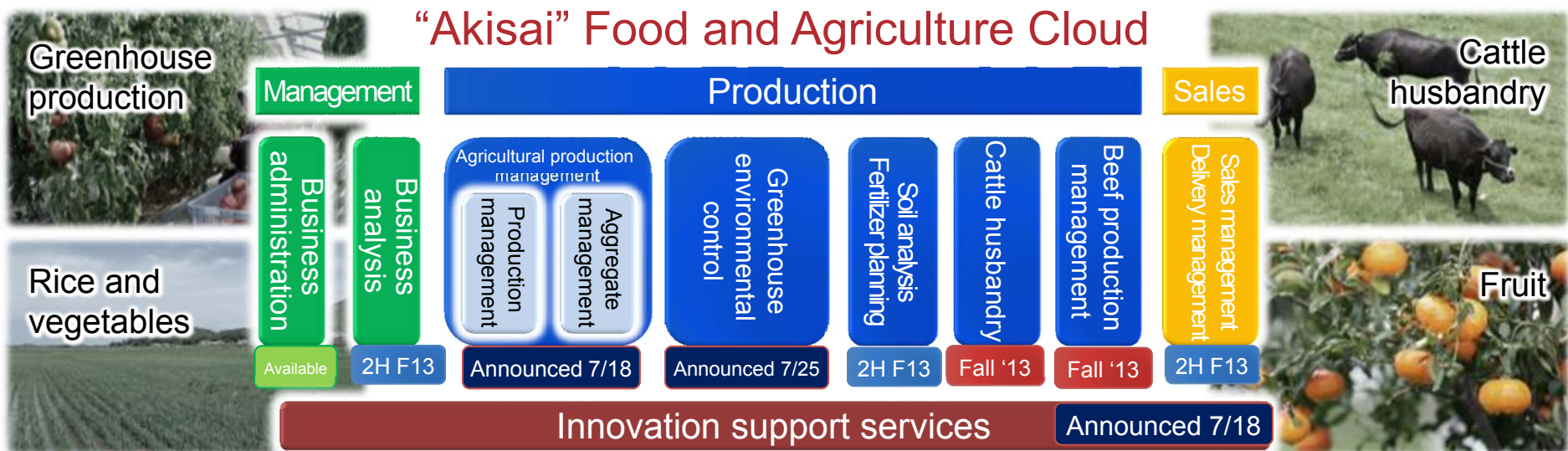(vehicle/equipment mgmt, vehicle database, cloud connectivity, etc.)

Communications gateway
(device authentication, connection, settings , etc.)

User management Content management Billing, etc.

Shared database

Emergency connection

Onboard equipment

In-car router (GPS/gyroscope/G)

Smartphone app

Wi-Fi

ECU

CAN

Emergency connection

Vehicle interface

Service interface

Car navigation system manufacturers

Car maintenance services

Smartphone data services

Metropolitan info services

Insurance companies

Various ventures

Driving assistance GIS info services

V2G/V2H services

3D navigation services

Probe services

Eco-driving services

Traffic info services

3D map services

EV services

Hazard map services

3rd-party POI services

Safe router services

Driver alert services

"Akisai" Family of Food and Agriculture Cloud Products FUJITSU

- Services enabling enterprise management style for agriculture, from farming to administration.
- Comprehensive system covering land use, greenhouse cultivation and animal husbandry.
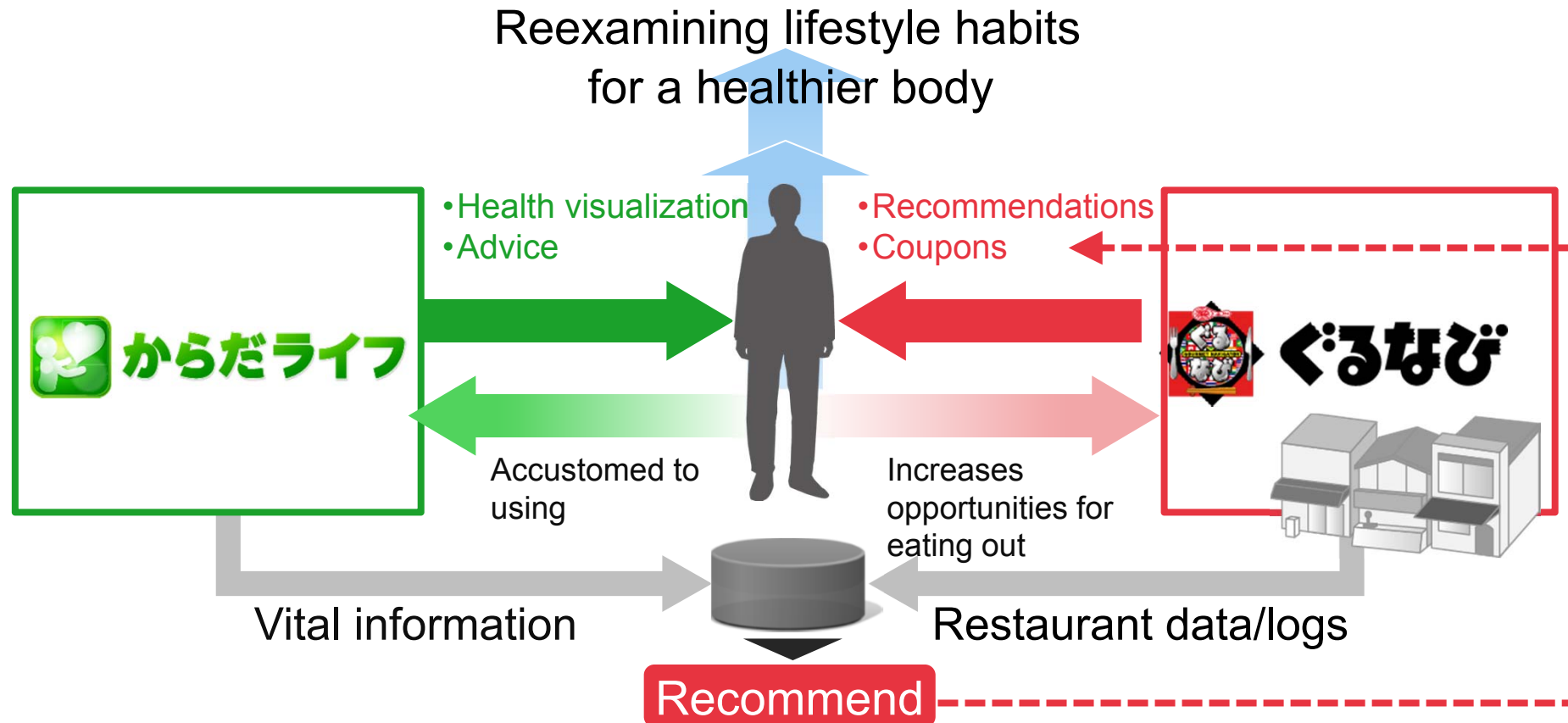- Innovation support service that supports systematic management practices in farms.

"Akisai" Food and Agriculture Cloud

Greenhouse production

Rice and vegetables

Cattle husbandry

Fruit

Management	Production	Sales

Business administration — Available

Business analysis — 2H F13

Agricultural production management: Production management / Aggregate management — Announced 7/18

Greenhouse environmental control — Announced 7/25

Soil analysis Fertilizer planning — 2H F13

Cattle husbandry — Fall '13

Beef production management — Fall '13

Sales management Delivery management — 2H F13

Innovation support services — Announced 7/18

Data collection → Storage, analysis → Application

The name "Akisai" derives from the Japanese words for "autumn" and "coloring."

Food & Health: Karada Life + Gurunavi

New services combining heterogeneous data

The combination of heterogeneous data makes possible new forms of added value
- Usage model for heterogeneous data
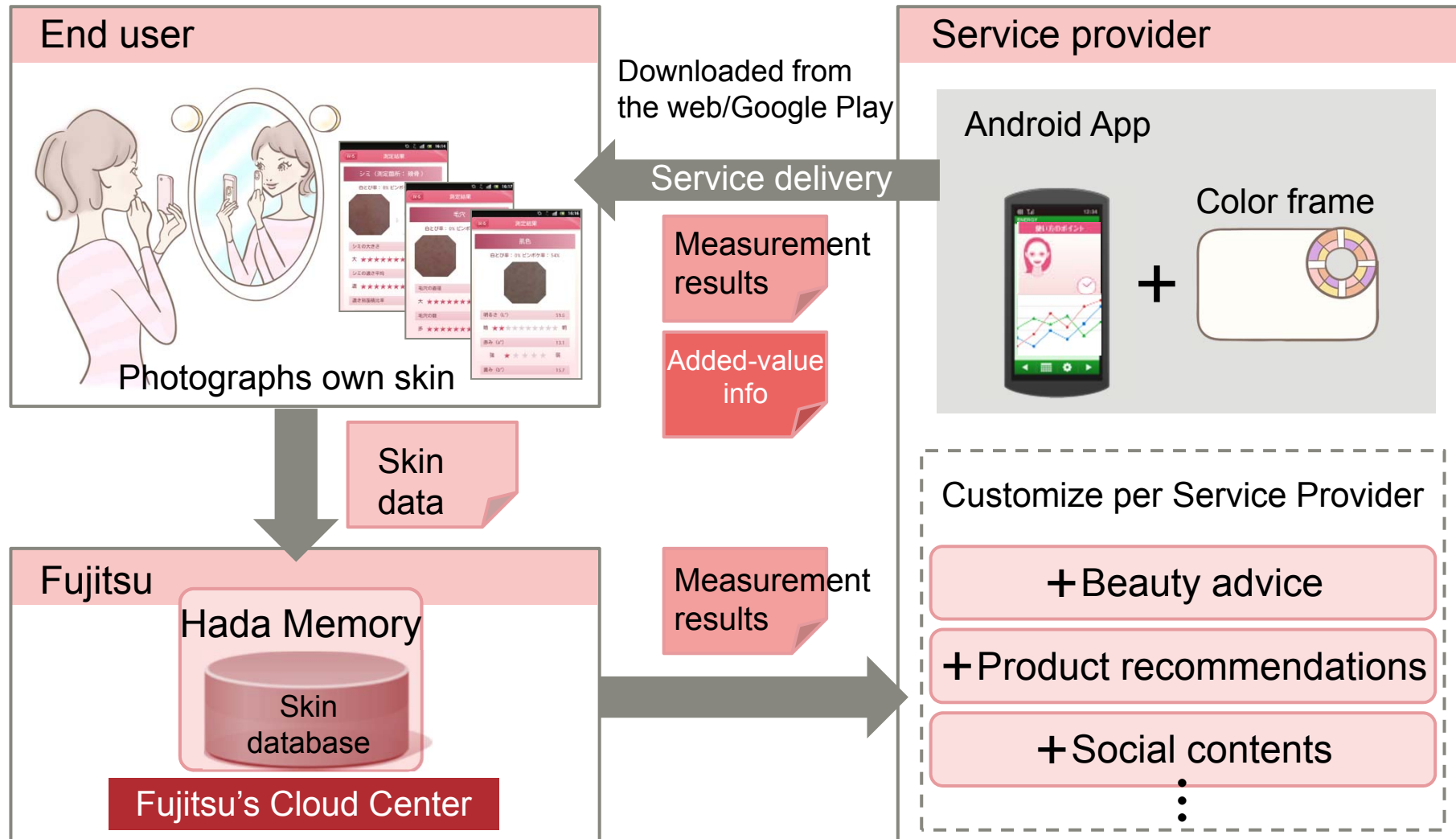- Tie-ups with different service providers for new mash-up services

Reexamining lifestyle habits
for a healthier body

- Health visualization
- Advice

- Recommendations
- Coupons

からだライフ

ぐるなび

Accustomed to using

Increases opportunities for eating out

Vital information

Restaurant data/logs

Recommend

Hada Memory

FUJITSU

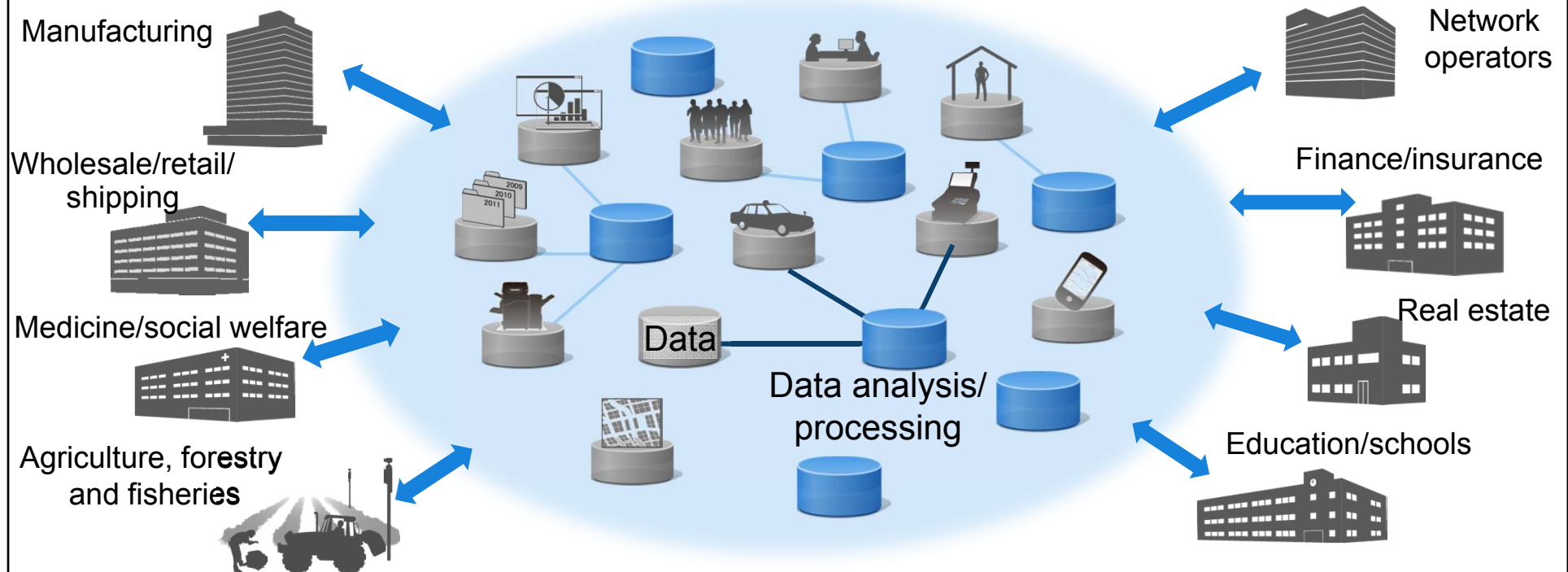A cloud service that uses skin images captured with a smartphone camera to measure spots, pores, and skin tone.

End user

Photographs own skin

Service provider

Downloaded from the web/Google Play

Service delivery

Android App

Color frame

+

Measurement results

Added-value info

Skin data

Fujitsu

Hada Memory

Skin database

Fujitsu's Cloud Center

Measurement results

Customize per Service Provider

＋Beauty advice

＋Product recommendations

＋Social contents

"DataPlaza" Concept

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Fujitsu DataPlaza was conceived as a way to gather information on different kinds of businesses and categories to accelerate the flow of data. As an expert in the utilization of data, we are aiming to satisfy the needs of a wide range of customers and support service providers in offering more sophisticated services.

Manufacturing

Wholesale/retail/ shipping

Medicine/social welfare

Agriculture, forestry and fisheries

Network operators

Finance/insurance

Real estate

Education/schools

Data

Data analysis/ processing

Fujitsu DataPlaza
Building a foundation for the utilization of data

DataPlaza Social Media Analysis Tool

Collects and analyzes comments from social media services. Displays graphs of results from a variety of analytical methods, making them useful for business purposes.

Launched Jan. 2013

Facebook

Twitter

Bulletin boards

Blogs

Social media analysis tool

News

Use in company operations
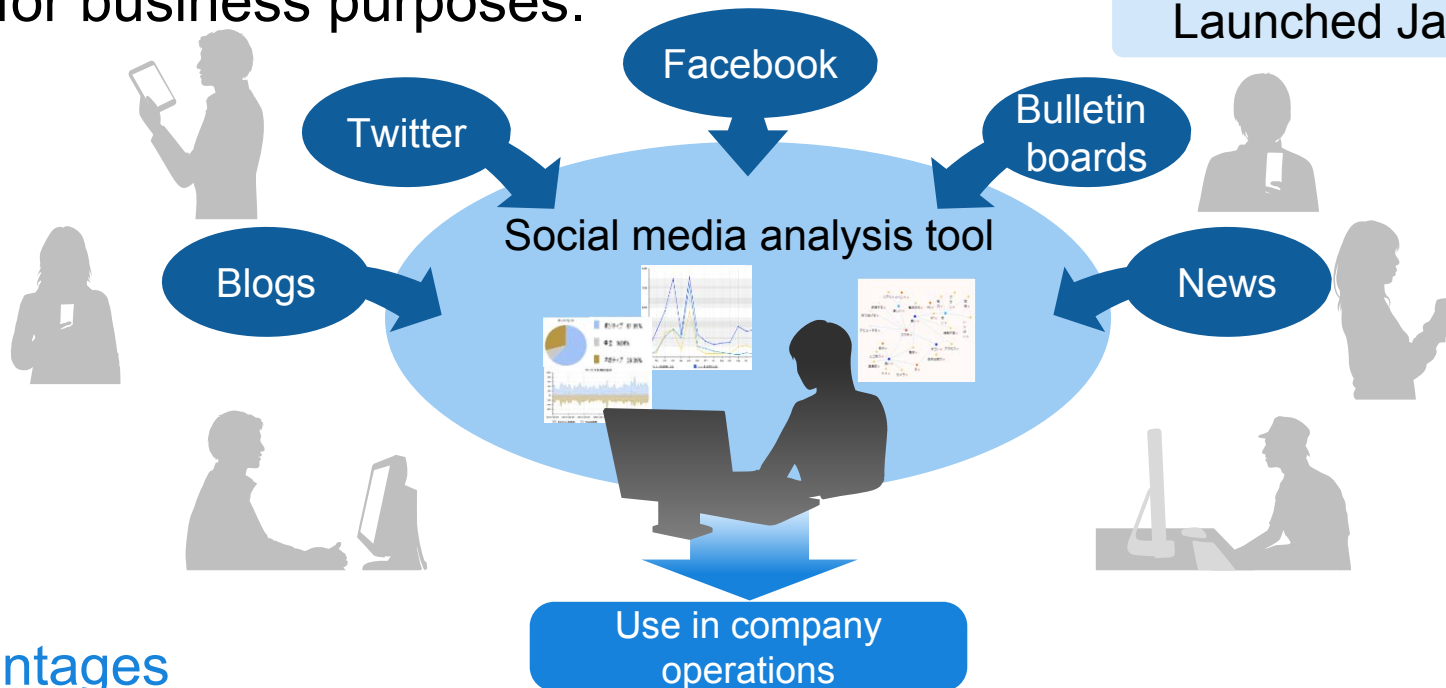
■Advantages

- Available through the cloud (SaaS), making it easy to get started with social media analytics.
- Offers a wide range of functionality at a low cost.
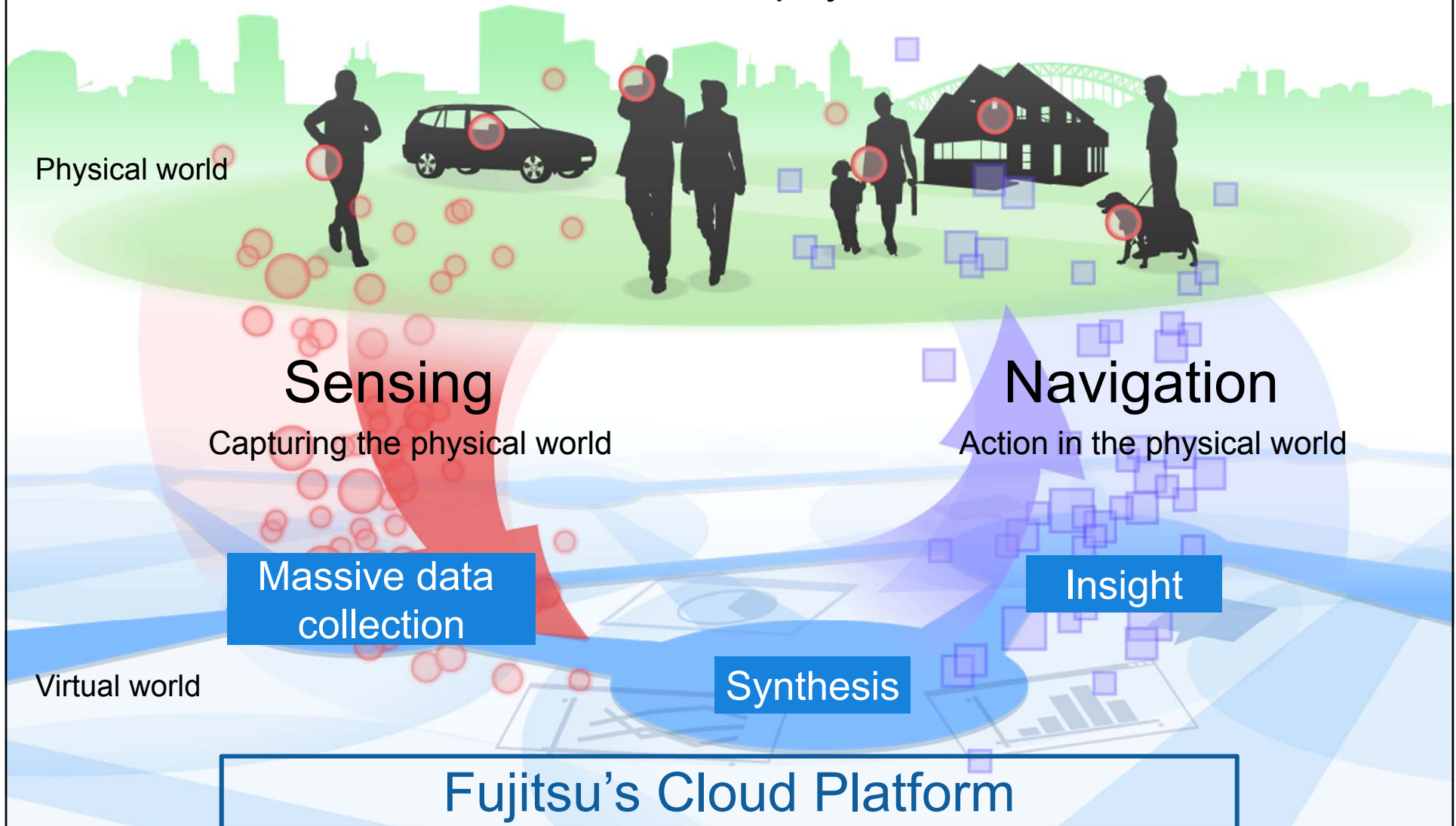- By combining business data with social media data, it is possible to generate new value.

■Sample usage scenarios

- Comparison w/competitors, opinion surveys
- Promotion surveys
- Consumer comments
- Trend watching, etc.

Fujitsu's Vision for Data Utilization

Close connection between the physical and virtual worlds

Physical world

Sensing

Capturing the physical world

Navigation

Action in the physical world

Massive data collection

Insight

Virtual world

Synthesis

Fujitsu's Cloud Platform

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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;
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