

# Fujitsu Big Data Software Use Cases



# Using Big Data Opens the Door to New Business Areas

The use of Big Data is needed in order to discover trends and predictions, hidden in data generated over the course of daily business activities. Big Data has now reached the stage of practical use through advancements in ICT, it has become an extremely important key to opening doors to new business opportunities.

Fujitsu supports our customers' strategic ICT investment and business strategies by providing Big Data solutions.

## Three Characteristics of Big Data and Tips for Use

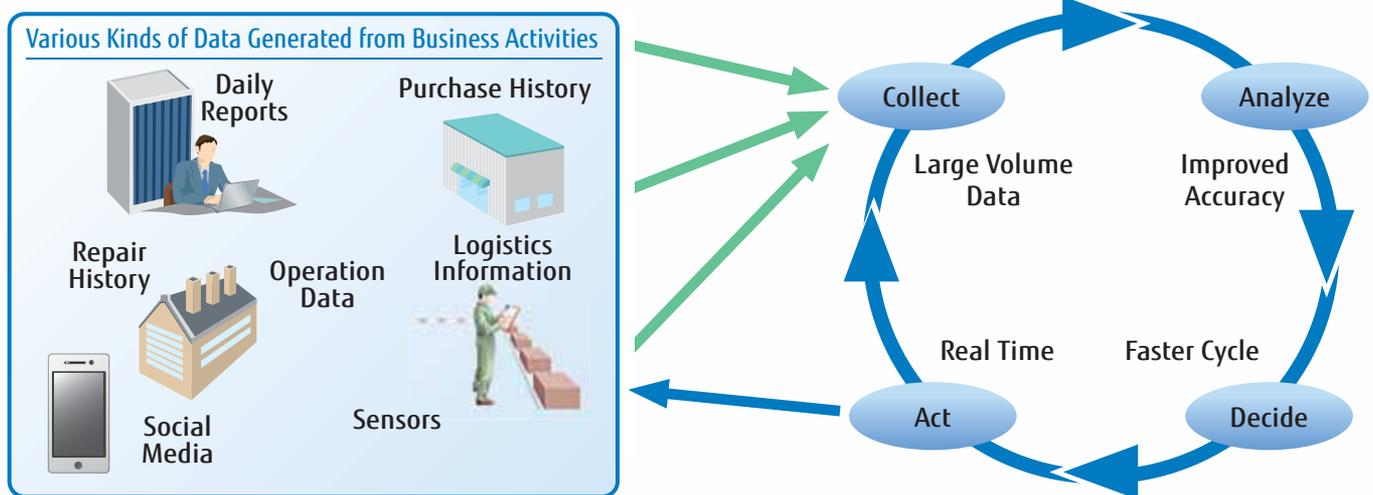
There are three main keywords when it comes to using Big Data: volume (large volume data), variety (wide range of data), and velocity (time sensitive data). By dealing with these characteristics, business scenarios can be created, deepened, expanded, and changed.

<p><b>Volume</b> (Large Volume Data)</p> <p>Large volumes of data extending into the TB or PB range</p> <p><b>Tip for use</b></p> <p>In the past traditional RDBs have not been able to handle large volume data such as web access logs and task logs, or if they have, the tens of millions or billions of data items would take days to process. Now, these data items can be processed faster than ever before.</p>	<p><b>Variety</b> (Wide Range of Data)</p> <p>Unstructured data such as text and images</p> <p><b>Tip for use</b></p> <p>Various kinds of unstructured data such as tweets exchanged on SNS*1, which were rarely used in business activities before, or call history data from call centers, can be combined with conventional data and analyzed.</p>	<p><b>Velocity</b> (Time Sensitive Data)</p> <p>Rapid creation of new data</p> <p><b>Tip for use</b></p> <p>New information created every second such as sensor data or location information from IC tags or smart devices can be processed in real-time.</p>
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## Significance of Utilizing Big Data

Big Data generated in social or business activities, including information from SNS, sensors or other data was rarely handled by conventional information systems. The use of Big Data is key to the success of businesses in the future.

In essence using Big Data is about collecting and analyzing various kinds of data generated from business activities. The information from this analysis can then be used to discover new trends or patterns to make business decisions or create new businesses opportunities.



The process allows you to collect various kinds of large volume data, analyze it accurately, make quick decisions and take actions in real time. Using Big Data will become increasingly significant for businesses as they engage in new activities and explore new opportunities.

\*1 Social Networking Service

## Big Data Usage Scenarios

Examples of Big Data use that brings about new possibilities in three different business situations with varying business needs.

### Improve Mission-Critical System Processing

#### ▶ With High-Speed Batch Processing

##### Daily Analysis of The Hottest-Selling Products Case A

By analyzing billions of sales data items for all stores through batch processing, each store can accurately select the hottest-selling products at a store level. This has led to an increase in sales.

##### Optimize Resource Assignment and Make-To-Stock Production by Reducing Electronic Report Batch Processing Time

Creating electronic reports through batch processing, which have thus far been considered an overnight job, can now be completed in significantly less time. Data can be processed faster and more frequently providing businesses with more regular and up-to-date information. As a result, resource assignment can be optimized and the accuracy of make-to-stock is increased.

##### Realize Around-the-Clock System Operation by Concurrent Execution of Online Processing and Batch Processing

Perform in-memory online processing and batch processing simultaneously creating a business system that can continually function without going offline or without interruption.

##### System Integration for Improving the Efficiency of Sales Activities

When integrated, the time required for overnight batch processing in the inventory management system and the sales system is significantly reduced. System integration enables sales activities to be performed efficiently based on accurate inventory levels.

### Strategic Use of Information Systems

#### ▶ With Extraction of New Value from Structured and Unstructured Data

##### Predict Trouble and Take Proactive Actions Case B

Signs of customer issues now can be detected quickly by automatically extracting patterns from records of past complaints and information on SNS. This quick response will lead to a higher degree of customer satisfaction.

##### Analyze Access Logs for Online Sales and Discover New Value Case C

By performing analysis on a combination of large volume web access logs and purchase histories, the hottest-selling products that correlate to specific customers, can be discovered, and create new business opportunities.

##### Correlation Analysis Between Diseases and Lifestyles Using Electronic Medical Records

By combining lifestyle information with electronic medical records the customer can now predict lifestyle-related diseases. With an understanding of correlations between diseases and calorie intakes, step counts per day and body weights we can help people adjust their lifestyles to reduce the risk of disease.

##### Analyze the Flow of Customers for Store Layout Improvement

By combining store camera records (customer flow, sex, ages, the time they visited) with weather conditions, and sales data from the POS system, we can analyze the optimal store layout. A store can easily increase sales figures through effective layout improvements.

### Challenge New Business Areas

#### ▶ With Real Time Analysis

##### Distribute Coupons Using Real Time Location Analysis Case D

A electric coupon delivery service sends e-mails to customers with recommendations matched to their tastes derived from their location information, membership information, and information on nearby stores.

##### Vehicle On-Board Device Information Based on Locations and Times Case E

By linking large volumes of traffic information and vehicle information, in terms of location and time, efficient and safe traffic conditions can now be applied through predicting and ascertaining traffic conditions based on actual data.

##### Use Comprehensive Health Information Effectively Case F

By combining and analyzing health checkup data and medical history data, the risk of contracting a disease in the future now can be predicted. This information can then be used by healthcare specialists to advise patients and subscribers ways they can improve their health.

##### Energy Supply and Demand Optimization

By monitoring real time information from smart meters, including the amounts of electricity generated, sold, and transmitted, energy forecasts for supply and demand can be optimized.

##### Predict Multifunctional Printer Failure and Provide Preventive Maintenance

By collecting logs of multifunctional printers in real-time and analyzing them against past failures, maintenance can be scheduled before parts need to be replaced. With a reduction in printing failures, customer satisfaction can be drastically improved.

# Use Cases

Case  
**A**

## Daily Analysis of The Hottest-Selling Products

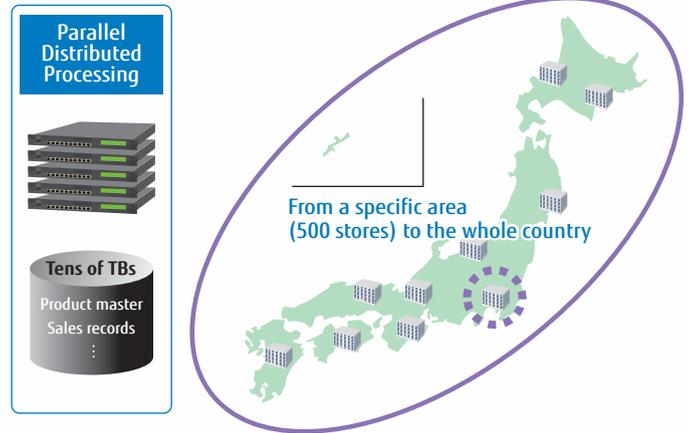
**Challenge:** Increase the number of stores to be analyzed from 500 to the entire chain and expand the profits of the whole group

### Our Solution

▶ Execute 10 times more batches processing, in the same amount of time, by using parallel distributed processing. This will expand the number of stores that can be analyzed from 500 to the entire chain.

### Benefits

- ▶ By ordering stock based on accurate analyses of the hottest-selling products rather than relying on intuition, the stores can expand sales and profits with less waste and more efficiency.
- ▶ By analyzing large volume data repeatedly, the stores can now provide their customers with appropriate information based on marketing intelligence and increase the number of regular customers.



Case  
**B**

## Predict Trouble and Take Proactive Action

**Challenge:** Combine and analyze a variety of data to detect signs of issues at an early stage and prevent them becoming serious problems

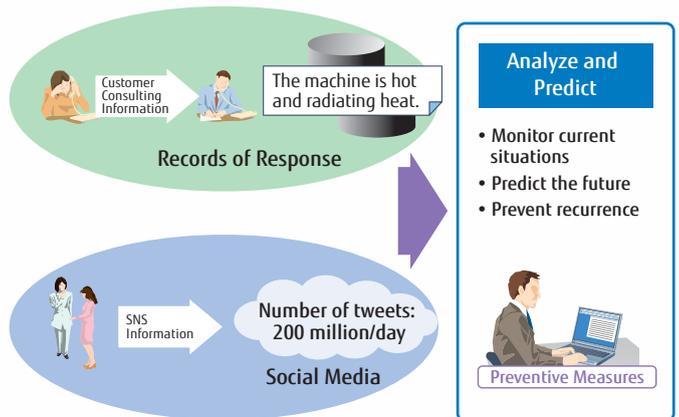
### Our Solution

▶ Analyze text information such as past complaints and the responses to them, automatically extract patterns that may lead to serious problems, compare them against current situations to detect signs of complications, and then take the necessary measures.

▶ Add information exchanged through SNS to analytic data to gain unstructured market information.

### Benefits

- ▶ By adding SNS information and tweets to the analysis, the signs of customer issues can be detected before formal complaints are received.
- ▶ By quickly and accurately analyzing complaints, customer satisfaction levels are discovered in real-time and any sign of a potential issue can be detected.
- ▶ A higher degree of customer trust is earned along with minimizing the time taken to respond.



Case  
**C**

## Analyze Access Logs for Online Sales and Discover New Value

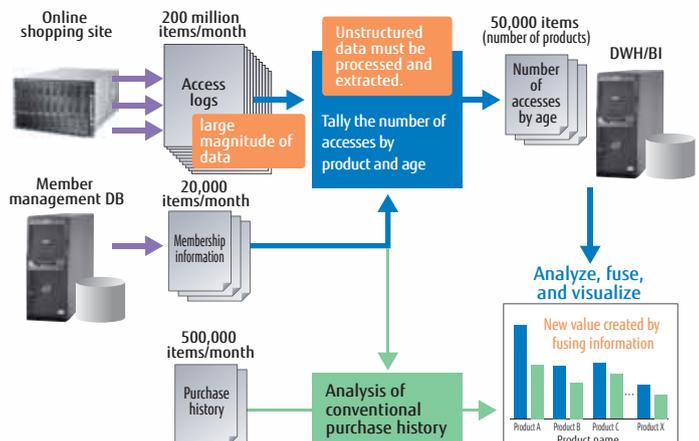
**Challenge:** Combine analysis results of access logs with purchase history information to expand the business

### Our Solution

▶ The Combination of what customers have purchased and what products have been frequently viewed by web users, can provide insight into potential growth areas.

### Benefits

- ▶ By performing analysis on a combination of large volumes of web access logs and purchase histories, hidden hot-selling products can be exploited and new business opportunities explored.
- ▶ As there is no need to transfer data to a processing server, the data can be analyzed quickly leading to a reduction in man-hours.



Case D

### Distribute Coupons Using Real Time Location Analysis

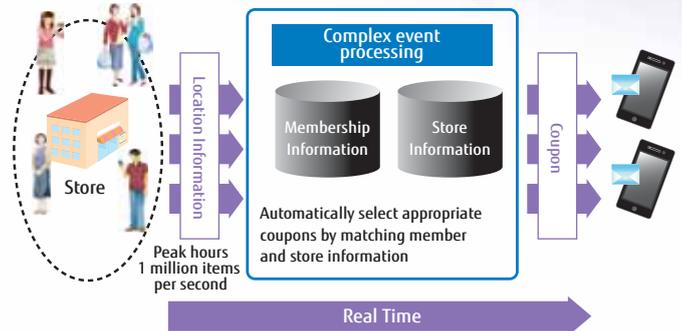
**Challenge:** Create new customers, through a new service, that sends e-mails containing recommendations based on the members' current locations and their tastes

**Our Solution**

▶ Compare customer location information, against membership information and store information, in real-time, to distribute e-mails containing appropriate recommendations.

**Benefits**

- ▶ By sending members coupons that suit their taste while in the proximity of the nearby stores, the coupon distribution company can improve the convenience and satisfaction of the members.
- ▶ Create new customers for stores and to the system, and attract customers during off peak seasons.



Case E

### Vehicle On-Board Device Information Based on Locations and Times

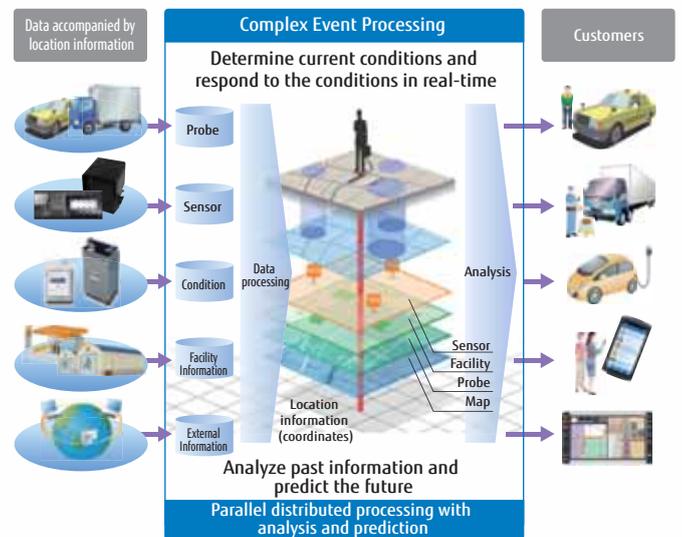
**Challenge:** Link large volumes of vehicle on-board device information with other information for efficient and safe driving

**Our Solution**

- ▶ Link large volumes of information including road conditions and information from the vehicle on-board device, such as locations and times in order to predict traffic congestion from different angles and analyze fuel efficiency.
- ▶ Link vehicle information, latitudes, longitudes, vehicle speeds etc., to information that has already analyzed including locations and times. This will enable traffic conditions to be determined and appropriate traveling routes will feedback to the on-board devices.
- ▶ Processed event information is accumulated and reused when needed.

**Benefits**

- ▶ By predicting traffic conditions based on actual data, the drivers can now determine roads to avoid congestion, improve fuel efficiency and prevent dangerous driving.



Case F

### Use Comprehensive Health Information Effectively

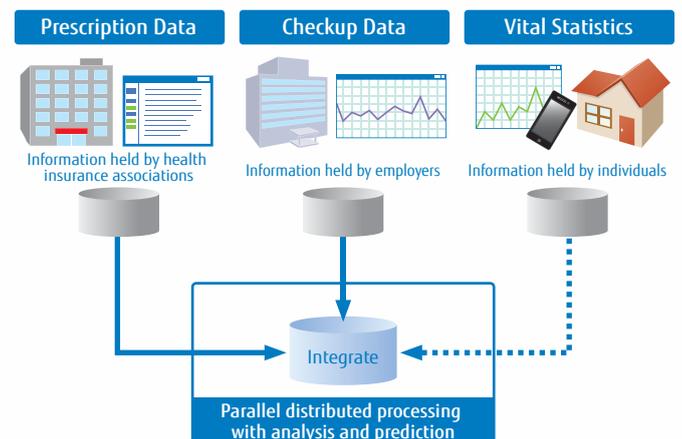
**Challenge:** Integrate health information from various sources to help patients and healthcare insurance subscribers promote their health

**Our Solution**

- ▶ Analyze health information including vital statistics for subscribers who sign up for this service. This will allow them to understand their current health condition and address future health risks.
- ▶ Integrate and analyze individual and general, medical history data, which was previously accessed separately, in a secure manner to predict medical benefits in the future.

**Benefits**

- ▶ Based on the results of the analysis, the health specialist can now offer health guidance more objectively and promote the subscribers' health.
- ▶ Medical expenditure is a major issue in the health industry and can be normalized by improvements to subscriber's health.



# Fujitsu Big Data Software

Fujitsu Big Data software enables Big Data to be utilized in enterprise information systems and mission-critical systems.

## Big Data Platform

### Interstage Big Data Parallel Processing Server

#### High Speed Parallel Distributed Processing Software

Interstage Big Data Parallel Processing Server is a parallel distributed processing software platform that supports improved data availability. It combines Apache Hadoop with Fujitsu's Distributed File System.

By combining Fujitsu's Distributed File System with Apache Hadoop, the new solution improves data integrity without requiring data to be transferred to Hadoop processing servers, thereby achieving substantially better processing performance.

Fujitsu's strong track record in mission-critical enterprise systems supports this technology.

### Interstage Big Data Complex Event Processing Server

#### Truly Real Time Complex Event Processing Software

Interstage Big Data Complex Event Processing Server delivers a high performance CEP engine by leveraging Fujitsu's proprietary stream processing and in-memory fast matching technology. Furthermore, rule description can be developed easier and allow for increased flexibility. Rules can be developed for complex analysis where required.

## Big Data Middleware

### Interstage eXtreme Transaction Processing Server

#### Highly Reliable Extreme Transaction Processing Software

Interstage eXtreme Transaction Processing Server is an in-memory distributed cache platform that supports improvements in application performance and data management. Used for high-speed access to large amounts of data and extreme transaction processing, it provides improved application scalability and reliability.

### Interstage Business Analytics Modeling Server

#### High-Precision Analysis and Forecasting Software

Interstage Business Analytics Modeling Server leverages Fujitsu's world-class proprietary machine translation technology. This technology interprets text and performs high-precision analyses and forecasts, by linking events in chronological order. Using over thirty data analysis processing modules that support parallel distributed processing, it is possible to quickly perform advanced analyses and forecasts.

## Fujitsu Platform Solution

Fujitsu provides a range of platform solutions. They combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships.

### Dynamic Infrastructures

With the Fujitsu Dynamic Infrastructures approach, Fujitsu offers a full portfolio of IT products, solutions and services, ranging from clients to datacenter solutions, Managed Infrastructure and Infrastructure as a Service. How much you benefit from Fujitsu technologies and services depends on the level of cooperation you choose. This takes IT flexibility and efficiency to the next level.

### Computing products

[www.fujitsu.com/global/services/computing/](http://www.fujitsu.com/global/services/computing/)  
PRIMERGY: Industrial standard server  
ETERNUS: Storage system

### Software

[www.fujitsu.com/software/](http://www.fujitsu.com/software/)

## More Information

Learn more about Fujitsu's Big data software, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.  
[www.fujitsu.com/software](http://www.fujitsu.com/software)

## Fujitsu Green Policy Innovation

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at:  
[www.fujitsu.com/global/about/environment/](http://www.fujitsu.com/global/about/environment/)



**Green  
Policy  
Innovation**

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