Co-creation 1

## An IoT-Driven Factory Optimization Solution

Visualizing equipment operating status and environmental data through IoT

Special Feature 2

# Digital Co-creation

for Sustainable Development

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## A Traffic-Monitoring System That Uses AI-Driven Image-Recognition Technologies

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Special Feature 2

## Co-creation 1

# An IoT-Driven Factory Optimization Solution

### Visualizing equipment operating status and environmental data through IoT

Manufacturers across the board want to enhance factory production efficiency. Of all the different approaches to streamlining production, the Internet of Things (IoT) holds enormous potential. Fujitsu recently teamed up with Intel Corporation to create a solution that leverages the IoT into visualizing status information on a factory-wide scale. By rolling the solution out across the world, Fujitsu is looking to make a positive contribution to the global environment.

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Co-creation 1 **An IoT-Driven Factory Optimization Solution**

# Visualizing equipment operating status and environmental data through IoT

In the effort to create a sustainable society, manufacturers of all kinds are faced with the challenges of improving factory production efficiency and minimizing their environmental impact. Since 2015, Fujitsu has been working with Intel Corporation (Intel), a leading American semiconductor manufacturer, to develop IoT-driven solutions for optimizing factory operations. As part of that effort, Fujitsu and Intel began a collaborative verification of the new system in April 2017 at Intel's Penang factory (Malaysia), the company's largest semiconductor factory outside the United States. The system uses IoT to visualize the factory's overall status, including energy usage and the operating status of semiconductor production lines.
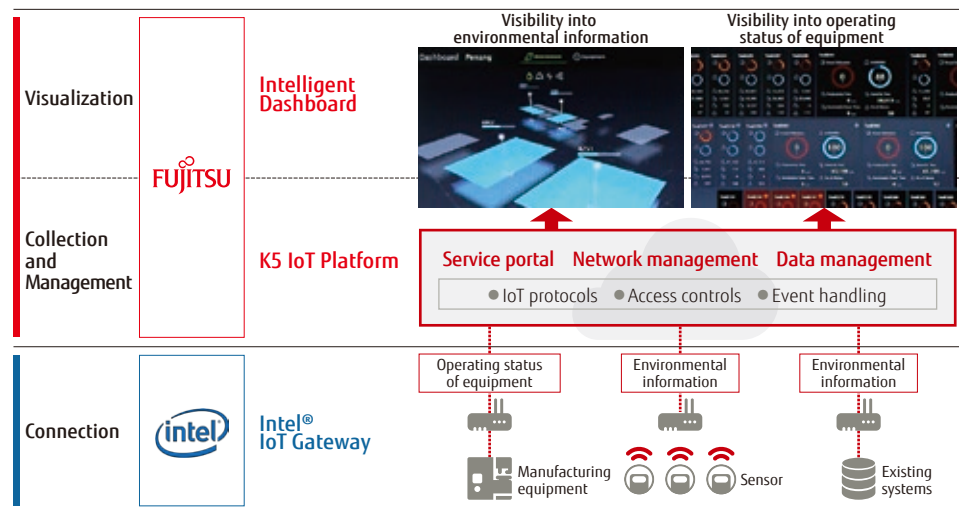
The Penang factory used to collect information on energy consumption and other environmental data on a monthly basis, gather data on production line operations by the equipment unit, and apply the information in various capacities, including efforts to improve production efficiency and identify the causes of equipment problems. However, management could not get a timely grasp on that data, which delayed responses. Management also lacked information on energy consumption and related costs, making it hard to establish a comprehensive, integrated understanding of all the data. The factory had trouble turning that information into facility-wide efficiency improvements.

The new system uses Intel® IoT Gateway and other offerings to collect a variety of environmental data from on-site electricity and water meters, gather operational status data from the production lines, and then manage the information in a centralized fashion. Incorporating Fujitsu's analysis and visualization tools, the system also displays cohesive visualizations of key indicators on user monitors. The system thus enables up-to-the-minute monitoring of production lines facing problems and provides users with daily detailed updates on multiple indicators, giving management the ability to implement countermeasures in real time.

Fujitsu has developed the system into a factory optimization solution, which it began offering on a global scale in May 2017.

**Integrated visualization of environmental data and production line operating status**





Production efficiency visualization system using IoT

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Special Feature 2

Co-creation 2

## A Traffic-Monitoring System That Uses AI-Driven Image-Recognition Technologies

**Cutting CO₂ emissions by enabling accurate detection of congestion and accidents**

Traffic congestion is becoming an increasingly serious social problem in many countries, especially emerging nations. Not only do crowded streets hamper economic development, but congestion also endangers the environment. To help mitigate these traffic issues, Fujitsu developed a traffic-monitoring system that uses AI-driven image-recognition technologies to accurately detect road congestion and accidents in real time.

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Co-creation 2  A Traffic-Monitoring System That Uses AI-Driven Image-Recognition Technologies

Special Feature 2

# Cutting CO2 emissions by enabling accurate detection of congestion and accidents

In emerging nations, burgeoning populations and fast-moving urbanization are creating the social issue of traffic congestion. Congestion does more than simply impede economic growth; it also hurts the natural environment by contributing to air pollution, and climate change. To help mitigate these traffic issues, Fujitsu developed a traffic-monitoring system that uses image-recognition technologies—which draw on Zinrai, Fujitsu's unique AI technology—to accurately detect road congestion and accidents in real time.

The issue with conventional image-recognition technologies was that they were affected by the environmental, including headlights, sunlight, and shadows,

which made it hard to analyze video from monitoring cameras. It was also difficult to efficiently and accurately recognize such varied and complex incidents as traffic accidents and violations.

Fujitsu's technology boosts recognition accuracy through AI technology, which learns a large, pre-assembled library of images. Leveraging that asset, Fujitsu's new technology can identify vehicle positions—even at night or under foggy conditions. The technology also observes changes in vehicle movement and speed. The technology quantifies the corresponding anomaly to make the process of detecting accidents and violations more efficient. In 2015, Fujitsu conducted collaborative field trials with the Tsingha University

Suzhou Automobile Research Institute to test the technology in China. The joint effort achieved high levels of recognition accuracy  at 90% to 95%.

With the new technology, users can gather congestion-related information that not only provides insight into the strategies for placing and controlling traffic lights but also helps identify ways of curbing the accidents and violations, leading to improvements in many areas, including safer urban transportation and fewer CO2 emissions. Organizations in Japan, China, and Europe are planning to implement the system and start using the service, which Fujitsu will launch services for in FY 2017.

**Detecting a wide variety of conditions in real time**



The system can detect congestion, accidents, and many other abnormalities at high accuracy levels.

**Enabling efficient, centralized management of conditions and incidents on a large geographical scale**



By giving users the ability to assess the scope and effects of various incidents, the system helps facilitate environmental measures, improve traffic safety, and alleviate road congestion.