"Using the tablets allows less experienced operators to spot problems easily by comparing the situations they encounter with stored images of normal operations."

Yasushi Nakamura
Director
Metawater Co., Ltd.

SMELL

TEMPERATURE

SIGNAL

Overhauling water facility maintenance using augmented reality technology.

At a glance
Country: Japan
Industry: Infrastructure
Founded: 2008
Employees: 1,960 including affiliated companies
Website: www.metawater.co.jp

Challenge
Metawater faces two principal challenges. The first is how to transfer the skills and experience in water facility repair and maintenance of the engineers approaching retirement. The second is how to improve efficiency.

Solution
FUJITSU Software Interstage AR Processing Server provides augmented reality (AR) technology. The software enables consistent quality of maintenance work not dependent on individuals' skills.

Benefit
- Boosted the efficiency of inspection operations significantly
- Inspection data can be stored on the server for analysis
- Prediction of component failures using on-site observations can transform water facility management

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Customer

Metawater is a leading Japanese provider of repair and maintenance services for water and sewage infrastructure. It also designs, manufactures and installs water purification plants and other public water supply facilities. With a national market share of 25 percent, Metawater is the leading service provider for local governments across Japan. Demand from local governments for repair and maintenance services is growing within this sector.

Products and services

- FUJITSU Software Interstage AR Processing Server

Challenge

Much of Japan's social infrastructure was built between the 1950s and the 1970s when Japan's economy was expanding rapidly. Much of this is now aging. The repair and maintenance of infrastructure, like expressways and water supply, is a major challenge for the country.

Metawater faces two principal challenges. The first is how to transfer the skills and experience in water facility repair and maintenance of the engineers approaching retirement. The second is how to improve efficiency. Water purification plants and other water and sewage facilities have many individual components, maintaining them is a complex task.

However, the work of water maintenance engineers has undergone a major change. Today tablet computers are tools of the trade. Using the built-in camera the engineer can view a component with relevant information overlaid on the screen. If the engineer notices anything wrong, he or she can take pictures of the area concerned and record an audio explanation.

Solution

The technology that makes this possible is the FUJITSU Software Interstage AR Processing Server, which provides augmented reality (AR) technology. The system uses a set of 'AR markers' that enable the device's camera to recognize the relevant components irrespective of water, pollution, distance or camera shake and display related information on the screen. A typical large-scale water purification plant employs a set of around 400 AR markers in the form of diagnostic sheets that an engineer can access instantly. This eliminates the need for engineers to carry manuals and note down inspection records on paper. The software enables consistent quality of maintenance work not dependent on individuals' skills.

Benefit

Metawater had previously developed an application for use in inspections, but it was not well accepted by maintenance engineers. Based on field research, Fujitsu created a mock-up of an AR system. Having visited sites many times to listen to the feedback of Metawater engineers, Fujitsu's team of service, technology and design development engineers reflected Metawater's needs in an easy-to-use interface with all the necessary functions.

This AR system has boosted the efficiency of inspection operations significantly. Another advantage of the system is that inspection data can be stored on the server for analysis. By comparing with historical data of component failures, the images and audio recordings can be used to predict similar failures so that components can be replaced before this happens. Prediction of component failures using on-site observations can transform water facility management. Rather than using time as the key parameter based on the suggested useful lives of components, facilities are managed based on their observed condition. This can translate into a substantial reduction in maintenance costs, with the gathered data also providing an easy means to accumulate relevant expertise.

Metawater began using the 'Smart Field Service' in October 2013 on its Water Business Cloud platform. Fujitsu's public cloud service Trusted Public S5 is hosting Metawater's cloud-based platform. Metawater, the first customer of Trusted Public S5, began using the service ahead of its official launch in 2011 and has been a user of Fujitsu's cloud ever since. The Water Business Cloud collects data from sensors installed throughout water facilities to monitor the operational status of the infrastructure as well as variables such as the level, quality and pressure of the water supply.

As part of the service it offers, Metawater shares this information with local governments and water management enterprises. Metawater has introduced the Smart Field Service to the roughly 100 water purification plants in Japan it now services under contract. By 2017, Metawater aims to expand its service provision to 1,000 local governments across Japan, which would represent a market share of 50 percent. The company also plans to encourage acceptance of its platform as the de facto standard by offering interfaces with the systems of other service providers. Adoption of Metawater's service is not only revolutionizing Japan's water and sewage industry, but could also contribute to solving social issues on a global scale by supporting environmental protection and helping improve quality of life.

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