

News Release

FOR IMMEDIATE RELEASE

Hitachi Launches Moving State Management Service that Uses Beacons to Visualize the Behavior of Workers at Construction Sites

Effectiveness Verified in Singapore-based Field Tests, Showing the Service Helps Improve Work Efficiency and Ensure Safety

Tokyo, March 24 2017--- Hitachi, Ltd. (TSE: 6501, “Hitachi”) has developed a system that quantitatively visualizes the behavior of workers and field supervisors using beacons^{*1} installed inside the construction sites and smart devices. From June 2017, Hitachi will launch a moving state management service that utilizes the system. The service will allow construction managers and supervisors to optimally assign Man, Machine and Material at a construction site, streamline work schedules and bolster safety management, among other benefits.

Hitachi conducted field tests of the system on a joint basis with Takenaka Corporation from March to May 2016 at the construction site of the Changi International Airport Terminal 1 Expansion in Singapore. The field tests verified effectiveness of the system, and consequently, Hitachi began considering applicable markets and developing applications ahead of commercialization from June 2016. By offering the service to domestic and overseas construction firms involved with plants, social infrastructure and other projects, Hitachi will help boost work efficiency and ensure safety.

At a construction sites, as construction managers and supervisors have to manage the large number of workers of varying specialties, it is difficult to monitor the actions of each individual worker. To further improve work efficiency and ensure greater safety at construction sites such as these, the experience and know-how of these construction managers and supervisors is indispensable. However, in addition to the declining number of experienced managers in Japan, the management skills of human resources hired locally when carrying out construction projects overseas are also significant problems. On top of that, at construction sites where large volumes of metal are used, electromagnetic noise is generated when using radio waves to take positional measurements, introducing the technical challenge of increasingly large positioning errors.

Given this, Hitachi leveraged the experience and expertise gained over many years through its involvement in plants and social infrastructure projects together with advanced IT to develop proprietary algorithms to correct measurement data, achieving highly accurate positional measurements that reduce the influence of electromagnetic noise. In addition, by using beacons and smart devices that can be easily installed and

relocated around the construction site to measure positional information on site workers, Hitachi has developed a system that quantitatively visualizes the actions of each individual worker. In the latest development, Hitachi has enhanced the versatility of the system so that it can be applied to various construction firms involved with plants, social infrastructure and other projects, and begun offering a moving state management service utilizing the system.

Moving forward, Hitachi will strive to develop a safer and more efficient work environment by adding to the service. Future initiatives will include the development of a safety management systems that issues an alert when a worker nears a restricted area based on the worker behavior visualization feature, and features that combine information such as worker movements and the progress of work based on three-dimensional building data.

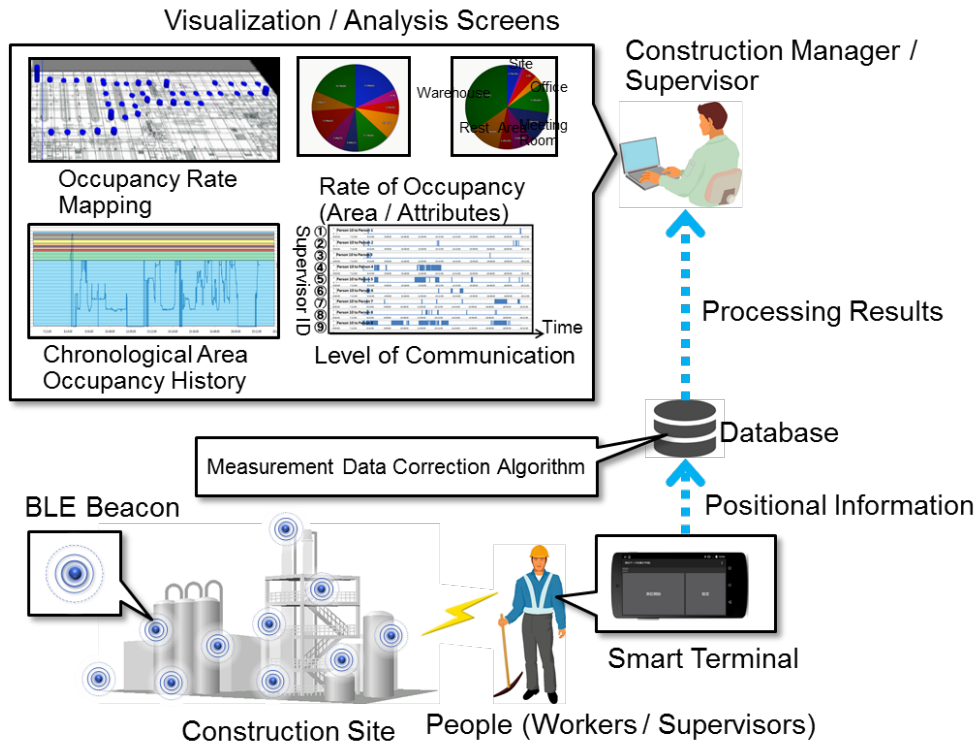
*1 Beacon: A fixed device that gives off electromagnetic waves or other signals, used to inform a receiving electronic device of its current position.

■ Features of the Moving State Management Service

1. Details positional information and other data on workers can be acquired
Through multiple Bluetooth Low Energy (BLE) beacons installed throughout a construction site and smart devices carried by workers and supervisors, detailed positional information on workers is acquired. In addition, using air pressure sensors embedded in the smart devices, the vertical positioning of workers can be measured simultaneously to detect situations such as when workers are engaged in work in high places.
2. The behavior of workers can be visualized
Based on positional information measured at the construction site, information such as occupied areas, rates of occupation and the state of communication between workers is collated according to various dimensions such as work type, affiliated company, work team and individual worker, and utilized in a feature that visualizes the information chronologically.
3. Improvement measures to boost work efficiency and ensure safety can be proposed
By visualizing the behavior of workers and obtaining detailed positional information, it will be possible to ascertain problems caused by worker actions early on, leading to improvements to boost work efficiency and ensure safety. For example, if it takes a long time for a worker to retrieve equipment or materials, or if workers are concentrated at a specific work area, a user could propose improvement measures based on the work status from the previous day, such as revising worker assignments

or the layout of equipment and material placement areas. In this way, construction managers and supervisors can achieve the optimal allocation of Man, Machine and Material, and develop efficient work schedules.

■ Concept of the Moving State Management Service



■ Service Launch Timing and Price

Name	Launch Timing	Price
Moving State Management Service	June 2017	Individual quotations
Features that combine information such as worker movements and the progress of work based on three-dimensional building data	October 2017	
Safety management system to issue alerts when a worker nears a restricted area	FY2018	

■ Note on Trademarks

Bluetooth is a registered trademark of Bluetooth SIG, Inc.

About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, delivers innovations that answer society's challenges. The company's consolidated revenues for fiscal 2015 (ended March 31, 2016) totaled 10,034.3 billion yen (\$88.8 billion). The Hitachi Group is a global leader in the Social Innovation Business, and it has approximately 335,000 employees worldwide. Through collaborative creation, Hitachi is providing solutions to customers in a broad range of sectors, including Power / Energy, Industry / Distribution / Water, Urban Development, and Finance / Government & Public / Healthcare. For more information on Hitachi, please visit the company's website at <http://www.hitachi.com>.

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