

Smart Building Solutions Using Digital Technology to Enhance Value (1)

# Development of BuilMirai Building IoT Solution for Small and Medium-sized Buildings

#Security #IoT/Data Utilization #Digital Solutions #Building Systems

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## Highlight

Recent years have seen increasing prices for energy and raw materials, climate change driven by global warming, rising labor costs accompanied by workforce shortages, and greater diversity of lifestyles and working practices. Amid all these changes, the building sector is seeing heightened interest in the efficient use of equipment and sources of energy that are better for the environment, more efficient and sophisticated building management, and improvements in the comfort of building users. This series of feature articles report on the work being done by Hitachi Group to provide comfortable building interiors and its plans for the future, focusing on advanced solutions that utilize digital technology for smart buildings.

This first article in the series describes the model Hitachi has adopted for the deployment in small and medium-sized buildings of its BuilMirai building IoT solution originally developed for use in large buildings.

## 1. Introduction

The trend in large redevelopment projects is toward the incorporation of dedicated smart building systems to ensure more efficient and sophisticated building management and to make efficient use of energy and equipment. For the small and medium-sized buildings that make up the bulk of Japan's building stock, however, progress on the adoption of smart building systems has been held up by factors that include the lack of a comprehensive set of solutions for this type of building as well as the initial cost of installation and other budgetary constraints.

Hitachi has in the past marketed its BuilMirai Internet of Things (IoT) solution as a smart building platform for large buildings, and the solution has been adopted in flagship developments such as Blue Front Shibaura (the Shibaura Project)<sup>1</sup>. More recently, however, it has also developed a model of BuilMirai that can meet the need for efficient building management and enhanced convenience in small and medium-sized buildings<sup>2</sup>.

## 2. Overview of BuilMirai for Small and Medium-sized Buildings

The first stage of BuilMirai for small and medium-sized buildings involves the provision of services in a package that combines smart security in the form of remote unlocking to provide secure access to condominiums and other similar buildings, smart monitoring that enables the remote viewing of security camera video from multiple sites, and smart building management that provides centralized remote monitoring of building facilities such as pumps and water tanks. These enhance the value of building assets by making the work of building managers more efficient and by providing greater convenience and comfort for users (see Figure 1).

The solution has the following features.

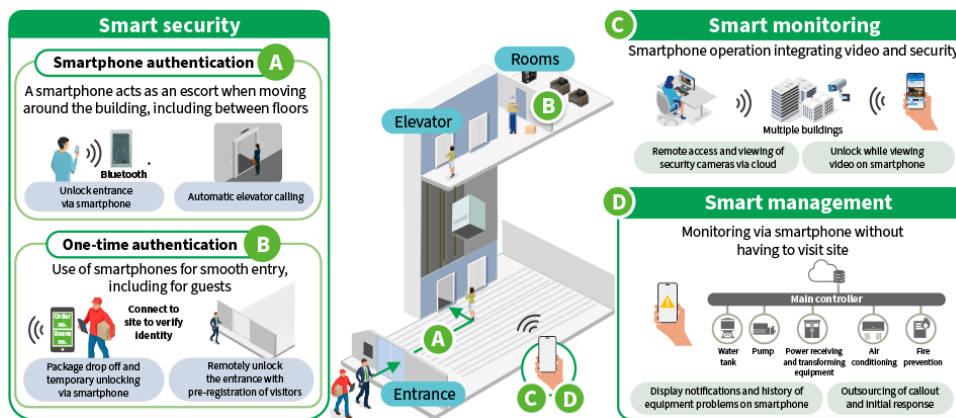
(1) Very convenient use via smartphones

All of the solutions can be easily used via a smartphone by apartment residents and building managers at any time and any place.

(2) Subscription model reduces the investment burden

Customers can select the solutions they need and subscribe to the service on a monthly basis, reducing the investment burden.

Figure 1—Overview of BuilMirai for Small and Medium-sized Buildings



\* Bluetooth is a registered trademark of Bluetooth SIG, Inc.

Smartphone-based services are combined into a package that includes smart security, smart monitoring, and smart management.

### 2.1 Smart Security

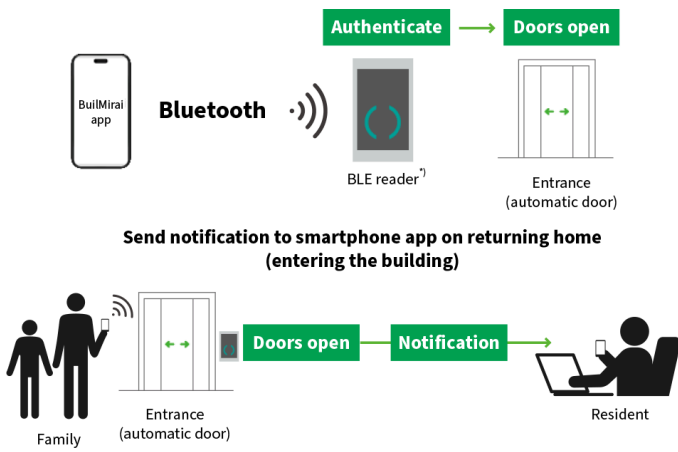
Smart security provides smartphone authentication enabling users to unlock security points such as entrances and elevators using a smartphone and one-time authentication to allow guests, designated service staff, and other visitors to likewise gain access.

Smartphone authentication provides security that is both convenient and highly secure by, for example, using the Bluetooth\* Low Energy (BLE) reader on a smartphone to open the automatic door at the entrance to the building. It can call an elevator down to the entrance floor and unlock it for the user (see Figure 2), and can also improve safety and security by sending a notification to family or other cohabitants when someone returns home (enters the building).

One-time authentication works by pre-registering visitors using a smartphone. This provides smooth entry to the building for guests, designated service staff, or couriers and allows for dropping off deliveries (see Figure 3).

\* Bluetooth is a registered trademark of Bluetooth SIG, Inc.

**Figure 2—Example Smart Security Services (Smartphone Authentication)**

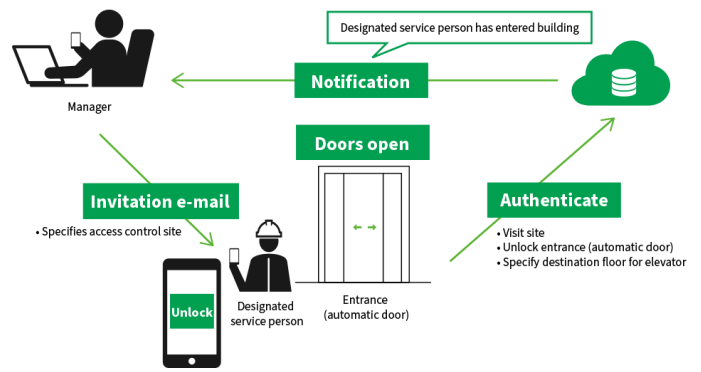


BLE: Bluetooth low energy

\* Bluetooth-enabled non-contact smartcard reader

Users can gain secure access to the building entrance and elevators using BLE communications. This provides security that is both convenient and highly secure.

**Figure 3—Example Smart Security Services (One-time Authentication)**



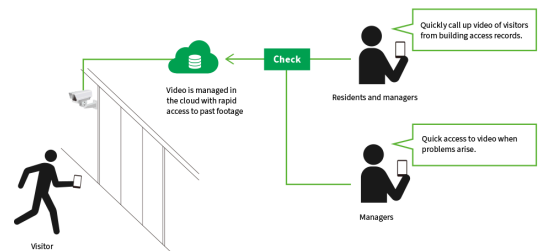
The building manager can use a smartphone to pre-register designated service staff prior to their arrival and send them an invitation by e-mail. When the designated service person arrives, they use the access control site to open the entrance door. The manager receives a notification to inform them who has entered the building.

## 2.2 Smart Monitoring

By managing the video from security cameras and other devices in the cloud, smart monitoring enables the viewing and downloading of video on a smartphone or personal computer (PC) at any time or place (see Figure 4). Should a disaster or other problem arise, this allows the building manager to see what is happening in real time without having to go to the site in person.

Combining this with Smart Security means that video of visitors can also be viewed based on building access records and that video from the entrance camera can be viewed to check on visitors before unlocking doors remotely.

**Figure 4—Example Smart Monitoring Services**



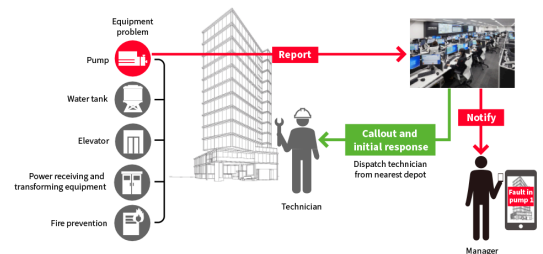
As video is managed in the cloud, it can be viewed or downloaded remotely using a smartphone.

## 2.3 Smart Management

Smart management provides automatic notification to a smartphone of problems with building facilities such as pumps or water tanks. That is, the status of equipment can be checked on a smartphone or PC any time and any place (see Figure 5). By enabling remote building management and centralized management of multiple buildings to make management more efficient, this helps address the problem of on-site staff shortages.

For customers who sign up for a site callout contract, Hitachi can also provide rapid callout and initial response service whereby a technician is dispatched from the closest of its approximately 300 depots across Japan if there are any problems with building facilities.

**Figure 5—Example Smart Management Services**



If an equipment problem occurs, details are sent to the control center at Hitachi Building Systems Co., Ltd. By informing the building manager, they can quickly identify the problem and take initial steps to deal with it.

### 3. Conclusions

This article has described the BuilMirai services that help make the management of small and medium-sized buildings more efficient and improve their convenience. In the future, Hitachi intends to further expand and enhance the range of solutions it offers while also expediting the global rollout of smart building solutions by developing a globally standard model of BuilMirai in collaboration with GlobalLogic, a Hitachi Group company based in the USA.

REFERENCES
<ol style="list-style-type: none"><li>1) Hitachi news release, Adoption of Hitachi’s BuilMirai Building IoT Solution as a Building OS at the Shibaura Project (Dec. 2023) in Japanese.</li><li>2) Hitachi Develops a Model of BuilMirai Building IoT Solution for Small and Medium-Sized Buildings to Strengthen Green &amp; Smart Building Business in Japanese.</li><li>3) Hitachi Building Systems Co., Ltd., BuilMirai in Japanese.</li></ol>

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