

# Smart public restroom

It's designed to improve the hygiene level and personal cleansing experience. Moreover, it gives insight to stakeholders to save manpower & resources, and enhances safety, operations and customer experience. The concept of modern smart toilets originated in Japan in the 1980s.

## **OUTCOMES SMART WASHROOM SOLUTION BRINGS**

*There are indeed numerous positive outcomes entailed by the smart restroom solution application. All of them significantly improve work process and decision-making.*

- *Number of complaints reduces.*
- *Restroom users can easily feedback on any problems they spot.*
- *Equipment is well-maintained due to real time data usage.*
- *A supervisor is always aware of daily, weekly, and monthly statistics concerning equipment exploitation, thus, is able to make the best decisions regarding rooms layout.*

*In addition to the abovesaid, there already exist smart sinks, mirrors, and toilets that by means of artificial intelligence adjust by moving up and down depending on who is using them; regulate surface, water, and pipes temperature; gather data about equipment and surrounding environment. Moreover, using machine learning and LoRaWAN, it is possible to teach smart devices to predict user's behavior, develop situational awareness, automate many processes, and thus simplify routine. For example, you might want to have a face recognition system that automatically adjusts water temperature and pressure to your personalised settings when you are*

washing hands or having a shower. Such innovations will definitely bring more convenience into life.

## **PLACES WHERE THE SOLUTION CAN BE BEST APPLIED**

Due to high people flow, queues, and often impossibility to predict usage frequency, some places are more relevant for smart washroom solutions application than others. Those places that would significantly benefit from smart devices introduction are:

- Transport hubs (airports, train stations, bus and tram stops, etc.)
- Conference/exhibition centres
- Music/sporting venues
- Shopping centres/malls
- Healthcare institutions

## **SMART PRODUCTS TO EQUIP RESTROOMS**

There already exists a range of products developed with a specific purpose – to equip restrooms of the future. Those are internet-connected devices that considerably improve restrooms maintenance and use experience. Below comes the description of some of such appliances.

### **AVAILABILITY INDICATORS**

By means of red and green light, indicators notify washroom users on cubicles availability, which, in turn, reduces congestion. Since it is not always clear whether there is a free cubicle, there might occur situations when stalls remain unoccupied while there is a long line and nobody wants to leave the queue to check if all the stalls are indeed occupied. Therefore, these indicators prevent such cases and release of the necessity to knock or to try doors.

### **SOAP DISPENSER**

*A smart internet-connected dispenser that ensures there is always enough soap for restroom users. It also helps avoid soap wastage by emitting the exact amount of soap a person needs to wash hands.*

## **SMART TAP**

*A touch-free tap ensures washroom users are protected from Legionella bacteria. The tap monitors water and pipes temperature and condition to alert the supervisor in case there is a risk of Legionella development.*

## **SMART CLEANING SYSTEM**

*The system injects a portion of biocidal substance with every flush to kill bacteria and odors. Besides, the system can provide workers with information about use frequency and even the amount of toilet paper left.*

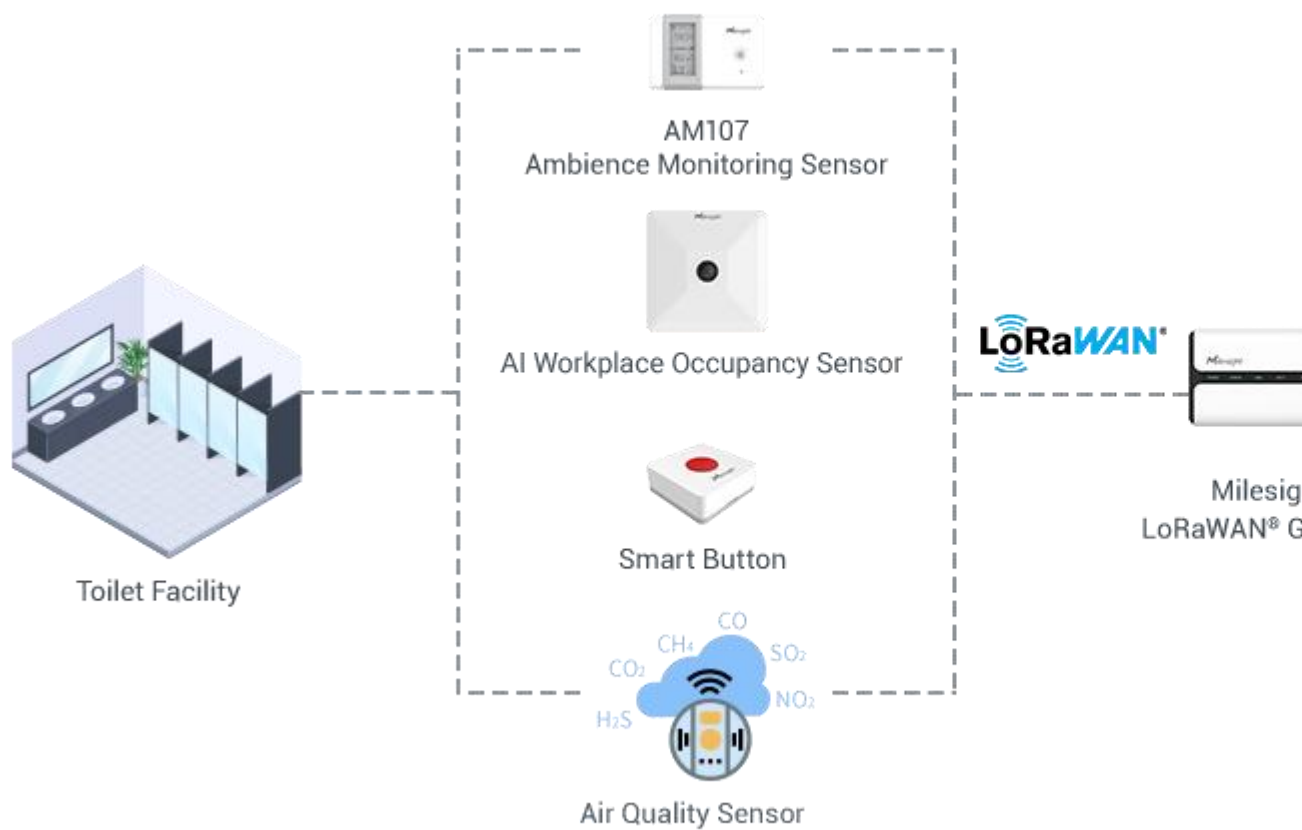
## **BENEFITS THE SYSTEM POSES**

- *Improvement of hand hygiene: each is encouraged to wash hands when leaving the washroom.*
- *Hand disinfection by sanitizer usage in hospitals to track hand hygiene compliance to help prevent hospital-acquired infections.*
- *Anonymity: separate individuals are not tracked, the system only counts the number of people entering and washing hands.*
- *Gamification of hand washing routine: people are not made to wash hands, they are simply stimulated to do that by showing the compliance rate and waking the desire to increase the percentage and see immediate changes in the graphs on a display.*
- *Availability of statistics on the number of employees who skip hand washing when leaving a restroom, which is crucial for any business, healthcare organization, and food industry.*

The utilization of LoRaWAN® and sensing technologies create an opportunity for developing the smart toilet. This solution consists of LoRaWAN® devices such as ambience sensors, Smart button, gateway, and cloud management platform. The AM107 includes multiple built-in sensors, such as temperature, humidity, activity level (PIR), CO2, TVOC, barometric pressure, and light, which offers real-time monitoring for ambience conditions and utilization rate of the toilet, while the AI Workplace Occupancy Sensor can help to indicate

whether the specific room is being occupied. By installing the Smart button, the elderly and the disabled person are easy to gain instant help when encountering an emergency in the toilet. All sensors' data are received by LoRaWAN® gateway and sent to Milesight IoT Cloud or other third-party servers.

### Application Example



### Benefits

- Reduce cost on energy and labor
  - Schedule maintenance in time with high efficiency
- Facilitate people in need with friendly user-experience
- Improve space utilization & cleanness