

# 智能洗手間管理系統

## Smart Washroom Management System

今年《財政預算案》提出在未來五年撥款逾六億元翻新約240所公廁。機電工程署(機電署)早於今年1月已着手尋找合適的新科技,用以管理本港的洗手間設施,並把改善洗手間的願望上載至機電署的「機電創科網上平台」,期望能協助客戶部門優化洗手間的清潔管理,提升公共服務質素。

今年6月,機電署率先於總部大樓四樓的洗手間加裝物聯網感測器,並開發智能洗手間管理平台,為使用者及清潔人員提供實時環境監測。智能洗手間管理系統利用分布在洗手間各處的感測器收集資訊,透過數據分析監測洗手間的使用狀況(例如廁格佔用率、排隊情況及室內空氣質素),並透過物聯網平台和流動應用程式,將有關信息實時反映在平板電腦或流動電話上,通知使用者附近可使用的洗手間及其潔淨程度,同時預測輪候時間。其他智慧功能包括感測器與吹風除臭消毒設備互聯互動、消耗品(例如廁紙及視液)餘量自動檢測、地面漏水自動檢測等,讓清潔人員獲得相關資訊,以便進行清潔和及時補充消耗品,優化清潔規劃工作。

我們可根據洗手間內的感測器測度人流和分析輪候時間,幫助分流使用者;而洗手間平面圖亦有助使用者快速了解其使用狀況。

客戶部門的代表在今年6月的創科研討會期間,參觀我們的智能洗手間,認識相關的物聯網概念。參觀者對智能洗手間管理系統的應用甚感興趣,踴躍查詢。



透過智能洗手間的流動應用程式,使用者能實時得知智能洗手間的輪候情況;如發現洗手間出現問題或故障,亦可透過流動應用程式通知物業管理單位。

Through the mobile application of a smart washroom, users get to know the waiting situation in real time. Users also can notify the property management through the mobile application if they find out any problems with or failure of the washroom.

This year's Budget proposed to allocate over \$600 million to refurbish about 240 public toilets in the next five years. As early as January this year, the Electrical and Mechanical Services Department (EMSD) already started searching for appropriate new technologies to manage washroom facilities in Hong Kong, and uploaded the wish for washroom improvement onto the EMSD's E&M InnoPortal, with the aim to help client departments enhance the cleaning management of washrooms and improve the quality of public services.

This June, the EMSD took the lead to install Internet of Things (IoT) sensors in a washroom on the 4th floor of the headquarters building and develop the smart washroom management platform, which provides real-time environmental monitoring for users and cleaning staff. The Smart Washroom Management System collects information with the sensors installed across the washroom, and monitors the use of the washroom (such as toilet cubicle occupancy, queuing situation and indoor air quality) through data analysis. Such information will be reflected real-time on tablet computers or mobile phones by means of the IoT platform and mobile applications, notifying users of available washrooms nearby and their cleanliness as well as the estimated waiting time. Other smart functions include interaction between sensors and air-blow deodorising disinfection equipment, automatic detection of the remaining amount of consumables such as toilet paper and liquid soap, automatic detection of water leakage on the floor, etc., which allow cleaning staff to obtain the relevant information for cleaning and timely replenishment of consumables, optimised cleaning plan in the long run.

We can estimate the flow of people and analyse the waiting time according to the sensors installed in the washroom, thus facilitating the diversion of users. The floor plan of the washroom also helps users quickly know about the use of the washroom.

Representatives from client departments visited our smart washroom during the Innovation & Technology Seminar in June this year to learn about the relevant IoT concept. They showed great interest in the application of the Smart Washroom Management System and were eager to know more about it.

如客戶對智能洗手間的應用技術和各項智慧功能感興趣,歡迎致電 2808 3593 向高級工程師陳賀賢先生查詢詳情。

If clients are interested in the applied technologies and various smart functions of the smart washroom, please contact our senior engineer, Mr. Steve Chan, at 2808 3593 for details.



安裝在智能洗手間的室內環境空氣質素感測器。  
Indoor air quality sensor installed in a smart washroom.