

# White Paper

## Optimized FM Service Delivery

### Case Study - University Hospital 2020

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## Introduction

Optiqo and its partner company Visera, were given the task to perform realistic measurements for visitor traffic as well as traffic flows within specific public washrooms at a University Hospital in Europe during the autumn of 2020.

Sensors which track the number of visitors were installed at 5 predetermined washrooms, spread throughout the hospital, in order to collect visitor data patterns at these locations. The total number of publicly accessible washrooms at this specific hospital is 400 (1500 washrooms in total).

## Project Scope

The purpose of measuring visitor traffic is to gather an understanding of how many visitors are accessing the washrooms in order to get a data driven, fact-based summary sample. Such a detailed report can assist in optimizing the cleaning service frequency based on the factual need for future cleaning subcontract tenders as opposed to random or traditional hourly or fixed frequencies.

Currently, the washroom cleaning frequencies amount to appr. 7,7 MSEK (0,9 MUSD) yearly for this specific hospital which corresponds to appr. 40 000 h or 20 FTE (all 1500 washrooms).

Under the present protocols, the washrooms are cleaned on a fixed frequency (see Table 1) with a distribution evenly spread throughout the day (same number of hours between each cleaning event). The challenge with this scenario is that the frequencies are arbitrarily determined and in no way take into consideration the actual number of visitors that frequent the washrooms.

Location	Mon – Fri	Sat – Sun
<b>WC – North Entrance</b>	3 times/day	2 times/day
<b>WC – South Entrance</b>	3 times/day	2 times/day
<b>DAT – South Entrance</b>	3 times/day	2 times/day
<b>WC – West Entrance</b>	3 times/day	1 times/day
<b>DAT – Emergency</b>	2 times/day	2 times/day

Table 1 – Current Cleaning Frequencies

Today, a majority of the Hospitals in Europe and North America, depend on a fixed frequency-based cleaning routine that utilize historical data and knowledge about the specific area. However, there are several factors that should be taken into consideration when choosing the cleaning frequency and by measuring the actual number of visitors, information gathered can provide Insights needed to implement optimized cleaning frequencies in terms of quality, cost and environmental footprint.

## Insights - Summary

A general observation is that all the washrooms monitored by Optiqo showed a peak in visitors during lunchtime, with the exception of the Emergency washroom where the number of visitors is spread somewhat consistently throughout a 24-hour period.

By determining the cleaning frequency based on the actual need (as per the collected data), such efforts would lead to an optimized service delivery in terms of quality without raising the costs of the service provided. The primary task would then be distributing the cleaning events based on the mean number (average) of visitors between each cleaning event. To make any such predictive service recommendations AI (Artificial Intelligence) algorithms can be used.

An optimized, need based cleaning frequency will lead to a more consistent and higher quality of service and additionally optimize the cleaning delivery in aspects of cost and reduction of its environmental footprint.



## Analyze

The participating hospital has an average number of 3000 washroom users per week with a total 88 cleaning events spread out over the 5 specific washrooms which were part of this project. Based on these input figures a mean value of 34 users/visors was recognized between each cleaning event ( $3000/88 = 34$ ).

After measuring and calculating the visitor traffic for 6 weeks, Optiqo determined that the actual numbers where between 5 to 74 visitors between each cleaning event. This indicated that some of the washrooms are cleaned "too often" and others were "under attended" or not frequented enough assuming that the ultimate goal is to reach a high consistent cleaning quality.

The current distribution of cleaning events during the day is arbitrarily spread evenly over the day without any consideration of the actual need based on the number of visitors between each cleaning event.

As an example, the washrooms at the West entrance are cleaned in the evening and also the following morning. Taking Into account that there is low number of visitors between each event (5-10 persons) It can be safely assumed that the washrooms are consequently cleaned too often. A cleaning performed earlier in the afternoon would raise the quality of the cleaning without accumulating any additional cleaning events.

## Time of day

How does visitor traffic change throughout any given day? When does the hospital manage the most visitors?

In order to obtain the appropriate knowledge and insights for the specific hospital, Optiqo needed to continuously measure the actual visitor traffic within the facility over a period of time. One such measurement was to determine when the peak in number of visitors was achieved and when the number of visitors was at its lowest?



## Weekday

Which days have the highest numbers of visitors?

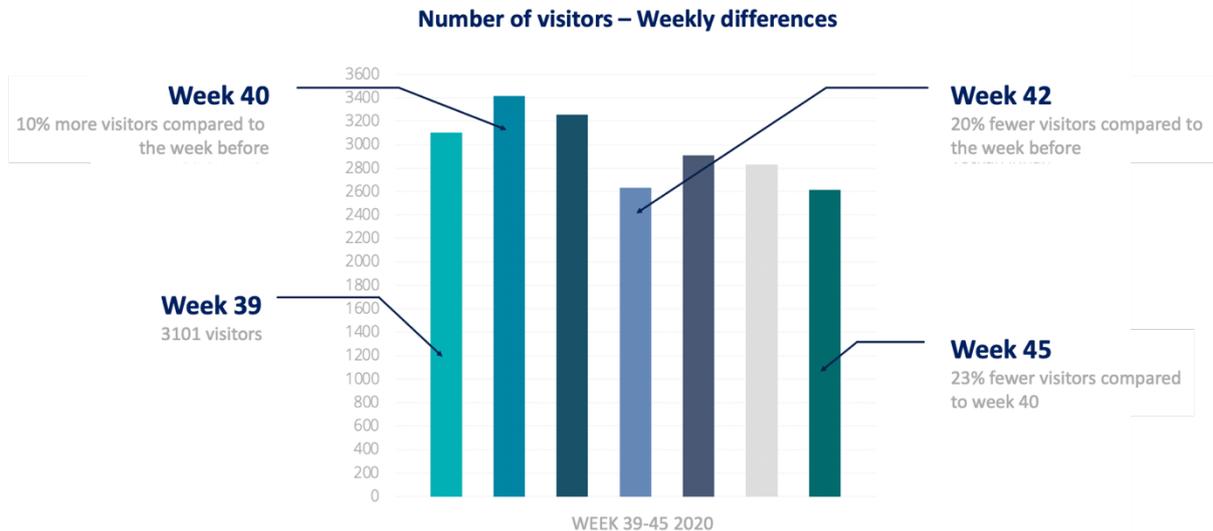
Throughout the 6 weeks of the project (week 39-45) there were 16% less visitors on Fridays compared to Thursdays and 60-70 % less visitors during the weekdays. In reality this means that it's increasingly to maintain fixed cleaning frequencies when the actual need differs as the data suggests.

## Week to Week

– How the visitor traffic changes week to week?

During the weeks 39-45 there was a drastic difference in the number of visitors from one week to another. For example, during week 40 there was a 10 % reduction of visitors compared to the previous week and during week 45 there was 23% less visitors compared to

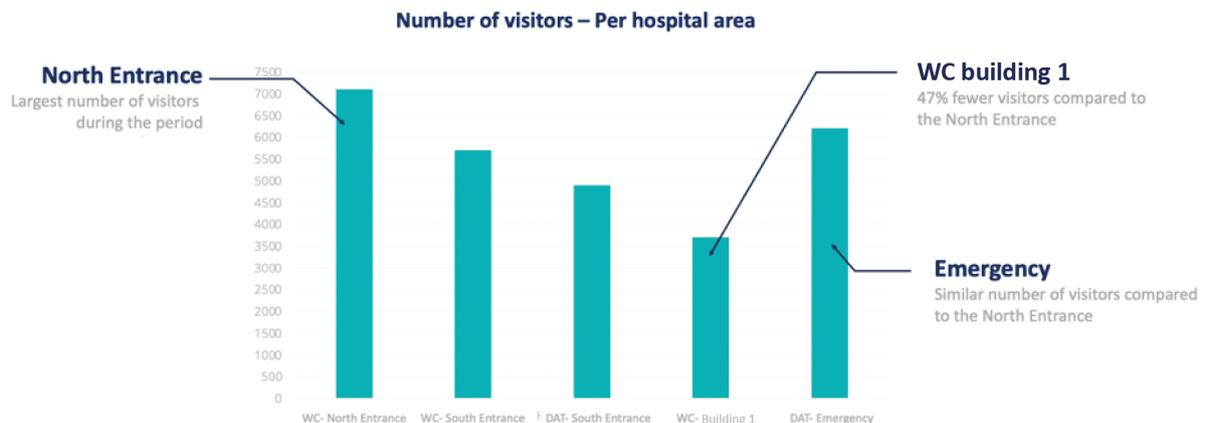
week 44. Such insights conclude that a possible reduction of cleaning events of up to 23% can be achieved during week 45 without reducing the overall quality level (based on the assumption that week 44 is cleaned at a standard quality level).



## Number of visitors in total

Which washrooms have the most as well as the least number of visitors respectively?

The North Entrance has more visitors compared to the South Entrance and considerably more visitors compared to the West Entrance. In spite of these facts, the three areas apply the same cleaning frequencies during weekdays. The Emergency area has almost the same number of visitors as the North Entrance but 33% less cleaning events during weekdays.





## Technology Enabler

Optiqo, based in Linköping Sweden, has a long and proven history of utilizing digital solutions when it comes to quality management service deliveries within Facility Management environments. Optiqo offers user-friendly digital validation checklists that replaces the old pen and paper model.

The Optiqo QlvrBox, which is an IOT connected hygiene monitor, logs the latest cleaning events and registers the number of visitors in a specific area where it is installed through the use of a PIR sensor.

Through the use of NFC scanning capabilities, the facility employees as well as patrons to the specific areas, are able to see the date and time of the last cleaning events. Moreover, the system will dynamically notify the cleaning personnel when a cleaning is required between frequencies (based on a predefined and optimized number of visitors).

The Optiqo system can also be utilized to calculate the most efficient cleaning protocols whereby, the most frequented areas will be cleaned more often and vice versa. This in turn provides for a smarter way of achieving a cost effective and need-based cleaning delivery and provides additional benefits such as:

- |  |                              |
|--|------------------------------|
| Quality assured hygiene                | Higher customer satisfaction |
| Safety for both visitors and employees | Cost optimization            |
| Raised cleaning quality                | Sustainable cleaning         |

By utilizing Optiqo's advanced platform for need-based optimized cleaning and service delivery, the processes of controlling and visualizing future cleaning protocols are greatly enhanced. By implementing IOT-technology (internet of things) and AI (Artificial Intelligence) through Optiqo's QlvrBox, there is no longer a need to apply advanced preparations prior to implementation. The hospital will benefit from the full effect of the Optiqo solution from the onset without any requirement for wired connectivity, WIFI connection or similar. The system collects real-time data for visitor traffic statistics in addition to the number of cleaning events on a regular basis. Moreover, the Optiqo QlvrBox can generate visitor generated service deviations and notifications which permits the facility management company to take action on any customer feedback in real time.

All the actual data can be accessed in a customized or generic based customer Dashboard which provides an overview of the actual trends based on real-time data. With such information, the actual outcome of the work that is carried out within the hygiene and cleanliness aspects can be monitored and validated.



## Questions for Facility Managers

- 1 What insights can be derived from this White Paper?
- 2 How can the cleaning frequencies be optimized based on your facility and visitor/employee traffic patterns?
- 3 How do you currently allocate resources to address site deviations and urgent requirement that can arise due to unforeseen peaks in visitor traffic?
- 4 Cost scenarios with current cleaning protocols?
- 5 Is it possible to optimize the service delivery as well as quality assurance yet continue to deliver a more consistent quality of service over time?
- 6 Is it possible to generate real cost savings by utilizing real-time data as the Information source for an optimized cleaning routine?
- 7 Is an optimized service delivery a precursor towards a more sustainable Facility Management operation?

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