

A SPACE UTILIZATION STUDY: 3-Phased Analytics Reveal Full-Day Vacancies

By Lowell Schneider, President, FacilityQuest

Optimizing a facility's utilization is strategically important to most facility management teams, and it makes sense to gather data on current usage before embarking on expensive modifications. Both stakeholders and decision makers can better manage the commitment towards institutional change with the confidence of data-backed options.

Utilization data from a *site observation study* offers the most reliable insights as compared to self-reporting or sensor-gathered data and is therefore the preferred solution for many such studies, despite being labor- and logistics-intensive. The challenge is to carefully structure the survey upfront to ensure that the data can be flexibly used later in a variety of contexts to support strategic business decisions. Said another way, the analysis phase of a study can often suggest new questions, but answers to those questions are limited to the granularity and nature of the data that was collected.

LEVERAGING TRIED-AND-TRUE SURVEY DESIGN

Considering business objectives for the utilization study impacts the survey design, and understanding best practices will keep options open. FacilityQuest ActivityAnalysis™ has been used by Gensler teams since 2011 as a solution to efficiently collect observation studies data, and over the course of hundreds of surveys the design for collecting the data (the survey questions) has stabilized. The key was to identify the right data variables that could be mixed and matched later in the analytical reporting phase when deeper analysis is needed to support the business objectives.

In 2014, FacilityQuest expanded outside of Gensler and recently worked with a global Top-10 management consulting firm and their architectural partner to conduct multiple time-based utilization studies. An initial study established baseline utilization, and then was followed by a comparison study six months later.

The collected survey data was (of course) the same across the two studies, but by the second survey the business requirements for analyzing and comparing both sets of data needed to go deeper. FacilityQuest was ready to support these new needs with a built-in analytics engine, eliminating the step of migrating the data to an external data hub and allowing for rapid iteration and evolution of the analysis *even as the data was still being collected*.

UNDER-UTILIZED VS. VACANT: SCRUTINIZING SEMANTICS

One objective was to establish trustworthy office vacancy rates by department and by role. With enough evidence of vacancy over time, the space could be considered for another use.

What is ActivityAnalysis™?

The FacilityQuest **ActivityAnalysis** solution helps facilities utilization survey teams efficiently and reliably collect observation data, and helps architects and facilities managers to monitor, scrub, and analyze the data.

- FacilityQuest provides on-site survey teams with hand-held devices preloaded with routes, observation stops, and structured data options to record for each stop.
- FacilityQuest aggregates the data on a cloud-hosted dashboard that the survey administrator can monitor at any time from any location.
- FacilityQuest has a report-building interface for deep, ongoing analysis of your data.

For a general understanding of “under-utilized,” an empty office might be simply noted as “unoccupied” on any of the passes recorded by the surveyor. However, this client wanted to know with a high degree of certainty that the occupant of the room was not present at any time during the day in order to count the room as vacant.

The survey already supported this requirement, distinguishing between “unoccupied” and “temporarily unoccupied.” All that was needed was giving the surveyors detailed instructions on looking for clues that an office occupant might just be away at lunch or at a meeting vs. unoccupied, which could be determined by observing no coats on chairs, no snacks on the desk, or other indications that the employee had been at his/her desk that day. This distinction made a strong case for vacancy when full days of “unoccupied” were identified in the reporting.

For this study, surveyors walked their routes at specific intervals nine times per day for 20 days. With full day vacancies firmly established as “9 unoccupieds/day”, a new business objective surfaced to understand half-day vacancies as well. Adding some post filtering to the full-day vacancy reporting enabled the half-day reporting, adding greater insights into overall vacancy and utilization.

3-PHASED ANALYTICS REVEAL FULL-DAY VACANCIES

Answers to basic utilization questions such as “Utilization by Stop” or “Primary Activity by Hour” are built in to the ActivityAnalysis reporting engine, which is optimized for aggregating and summarizing massive tables of observed data. Exploring on your own, these basic reports can also be easily customized to substitute any other variable.

A step beyond “basic” and “customized” is a need to aggregate and summarize the results from a *previous* report, and this was the case for the rigorous definition of vacancy. The scenario below gets a bit geeky, but the point is to illustrate the potential value of asking deeper questions and answering them with layers of analysis.

PHASE I: COUNTING RECORDS FOR “UNOCCUPIEDS”

This step filters “where primary activity = unoccupied.” The survey data gave evidence of nine observations per day per observed space, where rooms were assigned to departments and roles. So, the answer to whether a space was unoccupied was buried in massive data tables. Surfacing the data on full-day vacancies entailed hiding the data on everything else, filtering and summarizing *just enough* to be meaningful. A “Goldilocks” challenge, to be sure.

Each reporting phase builds results by counting and summarizing the data, for instance to show how many observances of “unoccupied” there are per day, per space, grouped by job type.

Structuring the report:

Dataset: AA Analysis: Count

By: BusinessUnit ... X By: Date, Space ... X By: JobType ... X

← Save Clear XLSX Swap X & Y Totals X Y Percent: None Table Raw

Filtering data for the report:

Data Filters

Date	Route	Stop	Room Type	Department	Primary Activity	Business Unit
All	All	All	All	All	Other	All
2014-10-31	SP-0-A	1	2 person office	Advisory	Pausing	Audit Support
2014-11-01	SP-0-B	2	3 person office	Audit	Phone	CHEC Audit
2014-11-04	SP-1-A	3	4 person office	Support Group	Reading	CHEC Tax
2014-11-05	SP-1-B	4	5 person office	Tax	Temp-Unoccupied	CIM Audit
2014-11-06	SP-1-CF	5	Meeting		Unoccupied	CIM Tax
2014-11-07	SP-1-CR	6	Meeting room		Video Conference with Media	Corporate Finance
2014-11-10	SP-1-D	7	Open plan		Writing	Dept Professional Practice

Filter Expression:

Post Filter Expression: data >= 9

Post function: CountNotNullByFirst10CharactersOfX

The results table for a query for “count unoccupieds per day” results in a table of 2000 + entries. But initially we don’t care about days in which the rooms were occupied some of the time. So the next step is to suppress all data about days without perfect scores of “unoccupied.”

PHASE II: FILTERING FOR FULL-DAY “UNOCCUPIEDS”

We created a report as a filter to identify the rooms that were marked “unoccupied” nine times in a single day, which indicated that the room was unoccupied every time the observer made a visit. We hid data on all other circumstances. Here is a partial result of this report:

Count records by BusinessUnit and Date Route Stop for "Director" (JobType) :

	2014-11-07 HM1-1 #3	2014-11-07 HM1-2 #14	2014-11-07 HM1-2 #26	2014-11-07 HM1-2 #29	2014-11-07 HM1-2 #3	2014-11-07 HM1-3b #31	2014-11-07 HM1-5 #46	2014-11-07 HM1-5 #5	2014-11-07 HM2-1 #8	2014-11-07 HM2-2 #21	2014-11-07 HM2-2 #34	2014-11-07 HM2-2 #43	2014-11-07 HM2-2 #6	2014-11-10 HM1-1 #3	2014-11-10 HM1-3b #31
BPIT									9.0	9.0	9.0	9.0	9.0		
FS Audit							9.0	9.0							
FS Tax			9.0	9.0		9.0									9.0

PHASE III: COUNTING FULL-DAY “UNOCCUPIEDS” PER BUSINESS UNIT

Rolling up the data yet again, a second custom filter made it possible to associate these unoccupied rooms with specific departments and business units for further cost/benefit analysis.

Count of Not-Null By Date on X Axis [CUSTOM CALC] : Director

	2014-11-07	2014-11-10	2014-11-11	2014-11-12	2014-11-13	2014-11-14	2014-11-17	2014-11-18	2014-11-19
BPIT	5	8	8			3	6	11	10
FS Audit	2	1	2	2	2	8	3	2	6
FS Tax	3	1	1	1		2	3	2	3

This second filter too is a built-in query, thus ensuring the same instant results on data collected during future looks at the complete dataset, and even in future surveys across different sites.

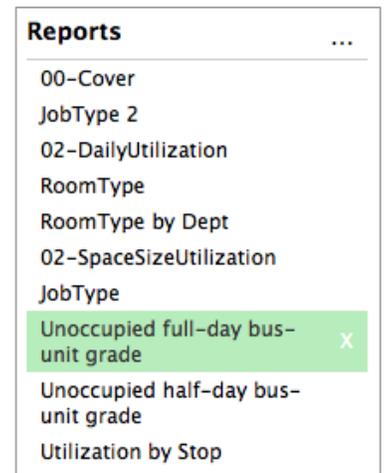
Reports based on these queries would provide comparable side-by-side comparisons of daily occupancy/vacancy rates in multiple facilities. This made it easy for the client to export and share the data featured in the reports in an email, presentation or spreadsheet.

HALF-DAY VACANCY RATES

Reaching still further, the client then decided to pursue how many half days of vacancy each department had (by role). Without details on the queries, the steps were similar:

1. Going back to the initial table of 9 observations, we needed to first filter out all of the “full day vacancies” (the focus of the first query)
2. With full day vacancies gone, we could now look for at least 4 consecutive “unoccupied” values that were anchored at either the beginning or the end of the day.

With these two vacancy reports, departments could now see the reality of their utilization of private offices, and make better decisions about how to use the precious resource of space.



A list of queries, including the newly added “unoccupied full-day bus-unit grade”

DELIVERING RELEVANT BUSINESS INTELLIGENCE

The team behind the FacilityQuest technology was an active participant in the analysis, ready to collaborate in finding the most efficient path to success. Data geek to data geek, neurons and technology whirring, the puzzle of layering report query on top of report query came together quickly. The ActivityAnalysis solution provided this project both a solid foundation of practical experience for collecting data and also the means to dig deep for meaning in the data.

With an ever-changing workforce, the nature of the workplace must also keep up. To respond efficiently, organizations are learning that they need to capture enormous data sets about the use of their facilities, then compare and analyze the data sets to interpret how people use their spaces, both over time and between facilities.

The FacilityQuest ActivityAnalysis solution integrates the experience of hundreds of observation studies across four+ years, for internationally recognized partners and clients such as Gensler, HJ Lyons and others. This experience bridges the surveying logistics, the data design, and the analysis reporting. The ability to collect standardized data for side-by-side comparison across time and multiple sites gives organizations the tools for finding insights that support strategic business decisions.



LOWELL SCHNEIDER founded FacilityQuest in 2010. Previously, he provided product development leadership and data integration expertise to innovative start-ups in the financial, healthcare, facilities, and automotive retail industries for companies including Sun Microsystems, Mitsubishi Bank, Wells Fargo and GE Healthcare.

In addition to software product development, Lowell has taught software development methodology courses to hundreds of engineers and has presented at Sybase User Group meetings and other venues. Recently, he has helped companies incorporate new technologies such as RFID and Zigbee into real-time information appliances.

For more information about FacilityQuest products and services, visit www.facilityquest.com, contact Lowell Schneider at Lowell@facilityquest.com or call +1-510-842-6210.