



# White Paper

## An Analysis of Space Utilization Study Length.

### Does three weeks provide sufficient accuracy?

Herman Miller's Space Utilization Service tracks occupancy patterns, so clients can determine whether there might be a more efficient way to allocate their workspace.

How does it work? Herman Miller uses unobtrusive sensors that temporarily attach to the underside of chairs. The sensors detect the slightest movement, indicating when each chair is occupied.

After analyzing the data, Herman Miller recommends space-allocation strategies aimed at reducing occupancy costs, improving productivity, and perhaps even supporting new work styles.

Currently, the Space Utilization Service collects occupancy data over a three-week period. Questions inevitably arise: Is three weeks long enough? On the other hand, could an even shorter study produce actionable findings?

To get the answers, Herman Miller commissioned Michigan State University's mathematics department to analyze data from past studies.

#### Results compared with longer study

It seems safe to assume that a seven-week study would be plenty long enough to assure accuracy. Over that length of time, the ebbs and flows of occupancy would even out, minimizing the impact of brief periods of unusual activity. But is a seven-week study necessary—or could sufficient accuracy be obtained over a shorter period?

To find out, researchers analyzed the data from one-, two-, and three-week periods within a representative seven-week study. The results of this analysis are shown in Table 1.

The "Average Difference Overall" shows how much the results of the seven-week study varied (plus or minus) from the results of shorter studies for the entire workspace being analyzed.

The "Average Difference by Room" shows how much the results of the seven-week study varied (plus or minus) for a specific conference room.

As Table 1 shows, overall utilization (middle column) changes little as study length

increases. The difference between seven- and three-week studies is just plus or minus 0.69 percent.

When occupancy is analyzed for a specific room, however, the difference becomes somewhat greater. A one-week study, for instance, could be nearly 30 percent less accurate than a seven-week study—clearly unacceptable. A three-week study, however, could be expected to produce an accuracy variance of plus or minus 5.61 percent—close enough to make decisions with reasonable confidence.

Conclusion: Accuracy is minimally improved when extending study length from three to seven weeks, but hardly enough to have any meaningful impact on space-allocation strategies.

#### Results compared with shorter studies

What about shorter study lengths? Is three weeks the sweet spot or would a shorter study period yield acceptable accuracy?

To find out, researchers analyzed the data from one- and two-week intervals within representative three-week studies. The results of this analysis are shown in Tables 2 and 3. Table 2 compares occupancy data for workstations, whereas Table 3 examines conference rooms and team spaces.

In Table 2, the "Average Difference Overall" shows how much the results of the three-week study varied (plus or minus) from the results of one- and two-week studies for all workstations in the study space. The third column, "Maximum Difference by Workstation," shows the most that results varied when comparing specific workstations individually.

In Table 3, the "Average Difference Overall" shows how much the results of the three-week study varied (plus or minus) from the results of one- and two-week studies for all conference rooms or meeting areas in the study space. The third column, "Maximum Difference by Room," shows the most that results varied when comparing specific conference rooms individually.

When analyzing workstations or conference rooms collectively, accuracy suffers only



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moderately as study length decreases from three weeks. The middle column of Tables 2 and 3 indicates that results for a two-week study vary by only about plus or minus 3 percent—not enough to be concerned about.

Individual workstations or meeting areas, however, are a different matter. As the third column of Tables 2 and 3 shows, results can differ by anywhere from 18 percent (two weeks, individual conference rooms) to more than 100 percent (one week, individual workstations). Clearly, these differences are too great to justify a shorter study.

Conclusion: Three weeks is the optimal study length, providing meaningful accuracy for both overall occupancy, as well as the utilization of specific areas within a study space.

**Table 1: One, two, and three weeks vs. seven weeks**

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Study Length	Average Difference Overall	Average Difference by Room
1 Week	1.26%	29.05%
2 Weeks	1.03%	8.49%
3 Weeks	0.69%	5.61%

**Table 2: Individual Workstations: One and two weeks vs. three weeks**

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Study Length	Average Difference Overall	Maximum Difference by Workstation
1 Week	5.17%	100.68%
2 Weeks	3.03%	47.59%

**Table 3: Conference Rooms: One and two weeks vs. three weeks**

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Study Length	Average Difference Overall	Maximum Difference by Conference Room
1 Week	7.21%	49%
2 Weeks	2.92%	18%