# CASE STUDY

## Global Architecture Company hires Precision Consulting to Establish the Reliability and Validity of Benchmarking Questionnaire

### About the Company

- Global architecture company
- Provides design and planning consulting to over 2,000 clients worldwide
- Services include architecture, brand design, product design and sustainability consulting
- Benchmarks performance of designed spaces through KPIs

### Goals

- Review and identify pitfalls in sampling methods used by the company in benchmarking
- Assess reliability, validity, and consistency of survey tools used
- Examine scoring methods for KPIs and recommend changes as necessary to improve their accuracy

### Approach

- Conduct Monte Carlo simulations to identify potential problems with sampling methods
- Use Structural Equation Modeling to investigate the validity of KPIs defined by the company
- Propose simplified approach to the calculation of KPIs, while improving their validity

The company provides architecture consulting services to global clients. Additionally, they use a survey tool, administered to their clients' employees, to quantify the quality of the workspace in terms of various metrics. The questionnaire is administered before and after a workspace redesign as suggested by the company, so that it is possible to measure the degree of improvement due to the company's intervention.

In addition to the measurements from their clients, the company has conducted a national survey across thousands of firms. The objective of this survey was to build a benchmark for comparison purposes with the results of their clients.

Since the questionnaire was developed internally by the company, there was no evidence that it properly measured what it was supposed to measure, nor that the sampling methods used by the company were adequate. Precision Consulting was retained to conduct an exhaustive examination of the data collected through the survey. These data included information both on the national survey, and on tens of thousands of employees from the company's clients. The objectives of the analysis were as follows:

- Review the sampling methods used by the company, to determine whether the collected data was valid
- Conduct a validation of the survey tool itself, to assess whether it is indeed measuring the intended KPIs
- Suggest possible changes to the survey to simplify it (increasing the response rate) and potentially improve its validity

## SOLUTION

Precision Consulting first worked with the company to fully understand the methodology it used to collect data from the national survey. A careful review of these methods revealed that they had some major limitations that damaged their use as a benchmark. Furthermore, an examination of the data collected

## Results

- Recommended alternative sampling methods to improve data quality in the national survey
- Identified questionnaire version with the best results
- Proposed removal of various questionnaire items, which would shorten its length while improving reliability and validity

through this survey revealed potential biases due to problems with the methodology. Precision proposed various solutions to improve the methodology and re-run the national survey to collect higher quality data.

Following that, an examination of the questionnaires was conducted, to assess its reliability and validity. The company had collected data using three different versions of the survey, and the validity of each of them was to be assessed separately. To this end, Structural Equation Modeling methods were used, utilizing the MPLUS statistical analysis software.

Structural Equation Modeling has become an increasingly popular analysis tool in recent years. This statistical procedure examines the inter-relations among all items in a survey. The purpose of the analysis is to determine whether items that should theoretically be correlated (those that are designed to measure the same KPI) are indeed correlated in the observed data. Additionally, output from the Structural Equation Modeling procedure can be used to identify problematic items and test whether validity would increase if they are removed.

## BENEFITS

1. Results from the Structural Equation Modeling procedure allowed Precision Consulting to determine which version of the questionnaire exhibited the highest validity and reliability.

2. Additionally, it allowed finding a number of items that had a detrimental effect on the validity and reliability of the questionnaire. The company has since then removed those items and is now able to calculate KPIs that exhibit better consistency across different companies, and are more useful for comparison purposes

3. Finally, the results showed that the formulas used by the company to compute KPIs were unnecessarily complex. Simplified methods were recommended to calculate them, obtaining similar results (thus ensuring that the outcomes from new clients would be comparable to those from existing ones) while producing further improvements to reliability and validity