

Validity Evidence for the Cube One Framework: Examination of Objective Data

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ABSTRACT

The Cube One framework posits that three factors importantly affect organizational performance, namely practices that promote: productivity, customer satisfaction/loyalty, and employee satisfaction/loyalty. To date, research on the validity of this framework has relied on survey data and on the analysis of cases studies. The present research examines validity evidence using Fortune attribute rankings of the Most Admired Companies (for practices reflective of productivity, customer satisfaction, and employee satisfaction) and an objective measure, stock market capitalization, as the criterion. Concurrent correlational data across 52 industries were supportive (with large effect sizes) and longitudinal cross-lagged correlational results were suggestive of support for the framework.

Keywords: *productivity, employee satisfaction, customer satisfaction, organizational performance*

In today's increasingly competitive and global marketplace the need for a business to achieve a high level of organizational performance has reached an unprecedented level. The Cube One framework offers a relatively new perspective on what organizations must do to achieve excellent performance. The framework identifies three sets of practices that are deemed essential for organizational success, namely practices directed toward enhancing productivity, customer satisfaction/loyalty, and employee satisfaction/loyalty. More specifically, high levels of enactment of all three sets of practices are seen as necessary for high levels of organizational performance. The rationale for the framework, in brief, is that productivity-directed practices yield the efficient use of resources necessary for competitive success and the attainment of continued funding; customer-directed practices promote customer satisfaction and loyalty which are necessary for top line revenues to persist; and employee-directed practices enhance employee satisfaction and loyalty which are needed to convert inputs to outputs over a sustained period of time.

The Cube One framework conceptualizes the three sets of practices as locatable in three-dimensional space, such that an organization can be visualized as being High, Middle, or Low on each dimension—see Figure 1 for a schematic representation. An organization High on each dimension is classified in Cube One; in contrast, an organization with Low levels of enactment of all three sets of practices is classified in Cube 27. The primary question, therefore, is whether levels of enactment of the three sets of management practices are systematically related to organizational performance.

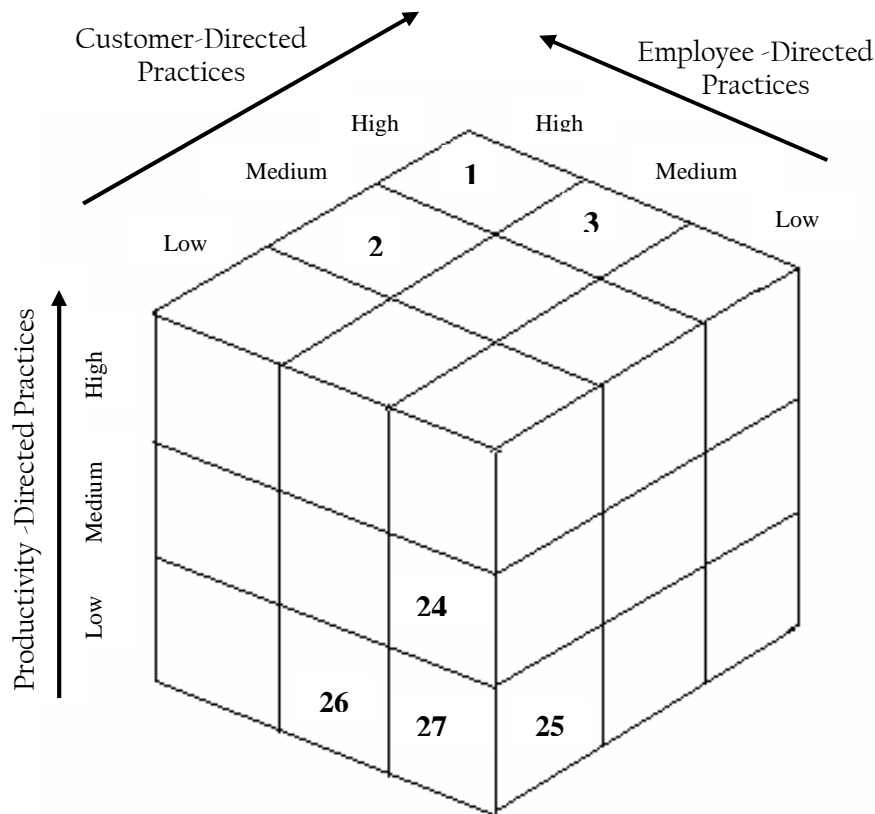


Figure 1: Schematic Representation of Cube One Framework

LITERATURE REVIEW

To date, two types of studies have been conducted in connection with the Cube One framework: the analysis of survey data and case studies. One set of survey data, obtained from approximately 800 employees, reports on the frequency with which 30 practices were enacted—10 pertinent to each dimension (Kopelman & Prottas, 2004; Kopelman, 2009; Kopelman & Prottas, 2009). Sample practices included the use of goal setting and systematic selection procedures to enhance productivity; obtaining continual improvements in product/service quality and price reductions to enhance customer satisfaction/loyalty; and efforts to share information and mitigate work-family conflicts to enhance employee satisfaction/loyalty. Ratings of organizational performance (as distinct from practices enacted) were based on three assessments: organizational goal attainment, comparisons to similar organizations, and attainment of potential. Results indicated that the organizations classified in Cube One (based on their High levels of enactment of all three sets of management practices) had significantly higher levels of organizational performance compared to those in Cube 27, those Low on all three sets of practices. In fact, the difference was 12.7 standard errors ($p < .001$). Indicative of the magnitude of this difference, it might be noted that the acclaimed Six Sigma threshold corresponds to 3.4 occurrences per million observations, or .000034. In addition to comparing the two extreme sets of practice combinations (i.e., Cubes One and 27), ratings of organizational performance varied consistently and as predicted across

organizations in intermediate cubes of the framework (i.e., those between the extremes of Cube One and 27). Evidence of validity is also provided by examination of the bivariate correlations between summated scores on each set of practices—(i.e., productivity, customer satisfaction/loyalty and employee satisfaction/loyalty)—and organizational performance. Associations were sizable and significant, the correlations being $r = .50, .43, \text{ and } .51$, respectively. Similar results were reported in a separate study of almost 1200 respondents (Letzler & Kopelman, 2008)—with correlations between productivity practices, customer satisfaction/loyalty practices and employee satisfaction/loyalty practices and organizational performance being $.64, .31, \text{ and } .48$. Because common method variance is a potential threat when utilizing survey data, conceptually unrelated measures were imbedded in both survey questionnaires. In both studies it was found that scores on conceptually unrelated variables (such as a respondent's benign world view) were unrelated to the frequencies of enactment of practices and to ratings of performance, indicating that differences in organizational performance could not be attributed to the measurement artifact of common method variance.

A second approach that has been used to examine the validity of the Cube One framework has relied on in-depth analyses of case studies (Kopelman & Chiou, in press). Two companies, both in the same industry, were examined with regard to their enactment of the aforementioned three sets of practices. Both companies were in the business of facilitating Internet searches, one having achieved a remarkable level of success (Google), and the other being no longer in business (AltaVista). Although numerous books and innumerable articles have been written about Google (e.g., Auletta, 2009; Battelle, 2005), no prior account has looked at the company's success through the lens of the Cube One framework. Seen through this perspective, it is clear why Google has been so successful.

Among the Company's productivity-directed practices are the following: business is conducted in a cost-conscious manner; employees are hired in a systematic fashion; employees are cross-trained and empowered; the organization's infrastructure is continuously improved; and highly collaborative teams are used on a project basis. Among the customer satisfaction/loyalty-directed practices are: use of customer feedback for product improvement; continuous improvement of products; a wide range of products/services being available; service lapses are followed by quick and effective recoveries. Google's employee-directed practices have received much acclaim including: granting considerable autonomy to employees (including one day a week of personal work time); provision of an outstanding work environment (including excellent food and shuttles); and encouraging a balance between work and private life.

Clearly, Google would score High, High, High on the three sets of practices, placing the company in Cube One.

The lack of success of AltaVista can also be interpreted in terms of the Cube One framework. AltaVista provided the first Internet search engine and its initial technical achievements led to excellent customer satisfaction and highly devoted users. Unfortunately, AltaVista was never a stand-alone company, but rather a division of a mainframe computer company (DEC) that had no plan for making money from searches. Due to the lack of investment, AltaVista's technical capability and service quality turned from "superb in 1995 to virtually gone in 1997 and to an embarrassment in 1998" (Monier, 2009—personal correspondence). It might be noted that Louis Monier's opinions should be afforded considerable credibility insofar as he was the engineer primarily responsible for designing the AltaVista search engine algorithm, and he subsequently held high-level positions at two very successful companies, eBay and Google. Indeed, Monier has confirmed the conclusions advanced in published reports. With declining technical superiority, not only did customer satisfaction and loyalty disappear, so too did the

key employees; and the lack of a coherent business model led to a scattered, non cost-effective business approach. Consequently AltaVista could be classified as being at a Medium level on customer- and employee-directed practices (at least initially), but Low on productivity-directed practices—placing AltaVista around Cubes 21-23.

There are advantages to each of the methodologies employed to date in examining the Cube One framework. The in-depth (ideographic) case study approach provides a richness of understanding that can rarely be attained through survey methods; and the survey (or monothetic) approach permits a wide breadth of systematic inquiry and the sophisticated analytical techniques. However, none of the extant research efforts has examined “hard” organizational performance data. The present inquiry uses relatively objective data (stock market capitalization) as the criterion variable in attempting to make inferences about the validity of the Cube One framework.

In broad terms (details are provided in the method section), the present research examines indicators of the three sets of practices using data from *Fortune's* surveys of America's Most Admired Companies, and the criterion variable of capitalized market value of each company. Predictor (management practice) scores and criterion (market capitalization) scores were obtained for two periods of time, 2006 and 2008.

Two hypotheses were advanced and tested. First, it was posited that an index of management practices in 2006 would be positively and significantly correlated with market capitalizations in 2006 (Hypothesis 1a) and likewise these associations would hold on a contemporaneous basis in 2008 (Hypothesis 1b). Second, based on the premise that management practices should be more predictive of market capitalizations than reflective of market valuations, it was posited that the correlation between management practices in 2006 and market valuations in 2008 would exceed the correlation between market capitalizations in 2006 and management practices in 2008 (Hypothesis 2).

METHOD

Data from *Fortune's* lists of America's Most Admired Companies provided experts' judgments as to the relative success of 621 companies with regard to eight attributes. Three of the attributes corresponded conceptually to the three sets of practices deemed essential to successful organizational performance per the Cube One framework. The attributes (1) *Quality of products and services*, (2) *People management: Ability to attract, develop, and keep talented people*, and (3) *Use of corporate assets* can be seen as indicative of success in terms of the level of implementation with regard to customer directed, employee-directed, and productivity-directed practices, respectively. The *Fortune* methodology for producing the 2008 results entailed examining the attribute ratings provided in late 2007 by 3,721 individuals who were highly knowledgeable about the 621 companies in 64 industries (Fortune Datastore, 2008). The Hay Group, which has for years administered the Most Admired surveys, queried “up to 10 top executives and 7 outside board members of the [eligible pool of] Fortune 1000 companies” (Haygroup, 2008). Rating were obtained using 11-point scales with endpoints of zero (poor) and ten (excellent), and these ratings were converted to attribute rankings and published by Fortune for each industry. The Haygroup has conducted research for America's Most Admired Companies since 2001 (Money, 2008).

For each of the three focal attributes the highest, middle, and lowest ranked thirds of companies in each industry grouping were assigned into three categories (High, Middle, and Low) and these scores were converted for this study into scores of 3, 2, and 1. Because the Cube One framework posits that all three sets of practices are essential for organizational success, the three scores were combined

multiplicatively. Thus the Predicted Organizational Performance score that was calculated for each company could range from 27 to 1. Predicted Organizational Performance scores were obtained at two points in time using the Most Admired data published in 2006 and 2008 (and these scores reflected judgments made in late 2005 and 2007, respectively).

The criterion variable used was the capitalized market value of each company. Although this metric is affected by numerous factors, including the debt and financial leverage of a company, it is at the minimum an objective reflection of the judgments of many investors as to the future outlook for a company. In the present research, the market capitalizations for each company reflected the average (mean) capitalization for every trading day of a two-year period (information that is provided by Bloomberg). Market capitalizations were calculated for two two-year periods of time, first for the years 2005 and 2006, and second for the years 2007 and 2008—these periods being hereafter denoted as 2006 and 2008).

The present research included only those companies for which complete data were available during both time periods (Most Admired rankings in 2006 and 2008, and market capitalization data for 2006 and 2008). This yielded an initial sample of 291 companies in 55 industries. However, three of the industries were dropped because there was only data for two companies in each; thus, the final sample was comprised of 285 companies in 52 industries. The unit of analysis for the present inquiry was the industry, and Spearman rank-order correlations were computed pertinent to the two hypotheses advanced. Because a correlation coefficient is necessarily constrained (between 1 and -1) mean correlational results were computed after performing an r to z transformation.

RESULTS

It was hypothesized that Predicted Organizational Performance scores in 2006 would be positively associated with market capitalization levels during 2006 (Hypothesis 1a). As predicted, the correlation was positive and statistically significant in three categories of industries (based on the number of companies compared in the industry), and for the entire sample ($r = .61, p < .01$)—see Table 1. Likewise, similar positive associations were found upon examining associations between Predicted Organizational Performance scores in 2008 and market capitalizations for 2008 (Hyp. 1b), the corresponding correlation for the entire sample being $r = .65, p < .001$.

Based on the assumption that practices should have more effect on market valuations than vice versa, cross-lagged correlations were examined. More specifically, for each industry two correlations were compared: (1) between Predicted Organizational Performance in 2006 and market capitalizations in 2008 and (2) between market capitalizations in 2006 and Predicted Organizational Performance in 2008. In industries where there were a small number of companies for analytic purposes (3 or 4 companies), relative magnitudes of correlations were as predicted ($r = .62, p < .05$ versus $r = .40, ns$), but the difference did not reach statistical significance ($Z = .80; p = .21$).

Similar results were found for industries with data from 5 or 6 companies: $r = .71, p < .01$ versus $r = .54, p < .05$; $Z = .83; p = .20$). In industries with 7 to 9 comparison companies, the relative magnitudes of correlations were the opposite of those hypothesized ($r = .39, ns$, versus $r = .55, p < .05$); $Z = -.51; p = .30$). Examining cross-lagged data for the entire sample of 52 industries, results were in the predicted direction ($r = .60, p < .001$ versus $r = .50$) but the difference was not statistically significant ($Z = .71; p = .24$).

Table 1: Mean Correlations between Predicted Organizational Performance and Market Capitalizations: Concurrent and Cross-Lagged Results

Number of Companies in Industry	Correlations between			
	POP '06 MC '06	POP '08 MC '08	POP '06 MC '08	POP '08 MC '06
3 to 4 (k = 17)	.64**	.85***	.62*	.40
5 to 6 (k = 20)	.58**	.64**	.71**	.54*
7 to 9 (k = 15)	.56*	.53*	.39	.55*
All industries (k = 52)	.61***	.65***	.60***	.50***

Notes: POP = predicted organizational performance; MC = market capitalization; k = number of industries in category. * $p < .05$; ** $p < .01$; *** $p < .001$ (one-tailed).

DISCUSSION

Data pertinent to productivity-, customer-, and employee-directed practices developed by the Hay Group and published by *Fortune* in their Most Admired Companies in America lists were generally supportive of the hypotheses formulated. Associations were consistently positive for the entire sample.

The magnitudes of concurrent correlations were sizable and significantly greater than zero; hence Hypothesis 1 was supported both in 2006 and 2008. Although the magnitudes of cross-lagged correlations were generally as predicted, differences did not achieve statistical significance; hence while it might be claimed that the data were suggestive of support for Hypothesis 2 (with the overall correlations being .60 versus .50), the results were not statistically significant. One obvious explanation for the non significant difference in cross-lagged correlational results is the limited statistical power available using industry categories that ranged from only 15 to 20 observations, and with the entire sample being comprised of only 52 cases. Another factor that likely contributed to the absence of a clear temporal causal priority is the high consistency in Predicted Organizational Performance scores at the two points in time. Because the correlation between Predicted Organizational in 2006 and 2008 was .84 there was little variance in the theorized independent variable. (Indeed, a test-retest correlation of this magnitude would be considered solid evidence of the temporal stability/reliability of a measure.)

As is the case with virtually all empirical research there are a number of shortcomings in the present endeavor. First, the experts' ratings of the attributes of the Most Admired Companies may not have been entirely valid; they may have been based in part on shared reputational views. Second, one of the three attributes examined in the present research does not line up perfectly with the conceptual definition of practices per the Cube One framework. Although service/product quality and people management are conceptually quite close to customer- and employee-directed practices, ratings of the use of capital do not correspond that closely to productivity practices. Ideally, the use of "best practice" HR data would more closely parallel productivity-inducing management practices.

Also, the present data were collected solely for US corporations. Results should also be examined in the context of different countries or economic zones. To be sure, it remains to be seen if the Cube One framework is applicable to other cultural contexts. This seems likely insofar as the previously mentioned two sets of survey data have yielded slightly stronger results when analyzed for nonprofit/governmental organizations than was the case among for-profit businesses. It would be contributory if the Cube One framework can be generalized to other settings, especially in light of the increasingly competitive global environment.

Yet, these limitations notwithstanding, there are a few strengths that might be noted with regard to the present research undertaking. First, the data were collected from different sources, which should

substantially mitigate the threat of common method bias (Podsakoff et al., 2003). Second, objective data were used as the criterion and results were examined on an industry-by-industry basis. Thus, if airlines, for example, were having a tough year, it might be misleading to attempt to draw inferences about a particular airline's performance when examining results across multiple industries. Third, the use of longitudinal data permits more confidence in testing propositions that imply a causal ordering. To be sure, the use of longitudinal data is a desideratum often mentioned in behavioral research but infrequently achieved.

In conclusion, the present research supported the Cube One framework at levels of association that Cohen (1992) defines as large effect sizes. Given the stability in Predicted Organizational Performance scores, it is also possible that stronger cross-lagged results may be found with a time lag of more than two years. Of course this remains to be seen.

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