The multidimensional relationships between organisational culture and performance

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ABSTRACT

This paper examines the multidimensional relationships between different types of organisational culture on various dimensions of organisational performance. The four cultural dimensions based on the Competing Values Framework (CVF) model (group, developmental, hierarchical, and rational) were examined against four types of performance: product quality, process control, product innovation, and process innovation. Data were collected from 194 middle and senior managers of Australian firms from various sectors, including both manufacturing and services. The results showed correlations among the four cultural characteristics, supporting their coexistence at organisational level. The findings also show the unique roles of different cultural dimensions in predicting different types of performance. Finally, the results showed correlations among several performance measures, supporting the accumulative view of competitive performance.

Keywords: organisational culture, organisational performance, innovation, quality management

INTRODUCTION

The role of organisational culture in affecting organisational performance has been discussed in literature. Literature on organizational culture commonly focuses on two major aspects of culture: content, which signifies the types of values and behaviours held by members of a firm, and strength or the depth and breadth of those behaviours embedded among the members. One of the earliest studies on this area was conducted by Peters (1982) which found a significant link between a particular type of strong culture and superior financial performance. A more recent study by Sorensen (2002) also suggested that firms with a strong culture excel in their financial performance although this is contingent on a relatively stable environment. Another study by Kotter and Heskett (1992), whilst echoing a similar result, found that the content (or dimensions) of culture – labelled as adaptive culture – is important in affecting superior performance in addition to the strength of culture.

This paper seeks to examine the aspects of cultural dimensions and strength in their relationships with organisational performance. Specifically, this paper attempts to examine the effect of four different cultural dimensions based on the Competing Values Framework (CVF) on quality and innovation performance. Quality and innovation were selected based on their recognition over the past two decades as major components of competitive performance (Cho and Pucik, 2005; Koufteros et al., 2002; Kroll et al., 1999). More importantly, quality and innovation were selected on the basis of a theoretical debate whether the two variables are in contrast or in harmony to each other. The contrast between quality and innovation suggests that organisations need to develop different types of culture.
to pursue either quality or innovation (Prajogo and Sohal, 2001). As such, this study contributes to the knowledge in this area by investigating the relationships between different cultural and performance dimensions, thus, considers the fit between cultural characteristics and types of performance. The importance of these simultaneous tests is two-fold in that it examines the existence and the relationships of different cultural characteristics within firms as well as the effects of these various cultural characteristics on different performance measures.

**THE EFFECT OF ORGANISATIONAL CULTURE ON PERFORMANCE**

The introduction of the concept of organisational culture has generally been attributed to several individuals, including Hofstede (1980) and Schein (1985). Although organisational culture has been defined in various ways, the definitions share a common view that “culture consists of some combination of artefacts (also called practices, expressive symbols, or forms), values and beliefs, and underlying assumptions that organizational members share about appropriate behavior” (Detert et al., 2000, p. 851). Culture, therefore, is an explanatory variable that distinguishes one organisation from another (Sathe, 1985). In the context of the Resource-Based View (RBV), organisational culture has been considered as valuable, rare and imperfectly imitable. Therefore, it can serve as a potential resource for creating sustainable advantage (Barney, 1986). This leads to further arguments that organisational culture is one of the key determinants of organisational performance (Denison, 1984; Lim, 1995). The key tenet of this study is that organisations have different strategic directions in terms of competitive performance (Porter, 1985), and, therefore, managers need to understand which specific culture (i.e. content) will support the achievement of certain types performance, including quality and innovation. The theoretical underpinning of the relationship between culture and quality as well as innovation is outlined below.

The role of culture in determining quality performance has been emphasised in literature (Becker, 1993; Dale and Cooper, 1992; Oakland, 1995; Thomas, 1995; Wilkinson et al., 1998). However, it took a while before culture had begun to receive attention in quality management (Maull et al., 2001). This is because the initial focus of managing quality was placed on the ‘hard’ tools, techniques, and systems, such as the seven quality tools, statistical process control (SPC), and ISO 9000 (Pegels,
This shift of emphasis was driven by the fact that, despite its promising expectations, TQM implementations have produced mixed results (Samson and Terziiovski, 1999). In this regard, scholars have attributed the failures of TQM to ignorance of the ‘soft’ (i.e. cultural) factors (Crofton and Dale, 1996; Kekale and Kekale, 1995).

Similarly, the link between culture and innovation has also been well documented in the literature (Ahmed, 1998; Brannen, 1991; Conceição et al., 2002; Kanter, 1983; McLean, 2005). In this study, innovation has been defined as “something that is new or improved and done by the enterprise to create significantly added value either directly for the company or indirectly for its customers” (Carnegie et al., 1993, p.3). A review of several major empirical studies on innovation suggests that at the firm level, organisational culture is one of the key determinants of innovation success (van der Panne et al., 2003) in addition to the effect of other contextual variables, such as size and structure (Damanpour, 1991). The characteristics of values and attitudes within a firm which support innovation include the following key words: changes, risk taking, creativity, stimulating, challenging, entrepreneurial, and growth (Claver et al., 1998; Herrmann et al., 2007; Hurley, 1995; Koberg and Chusmir, 1987).

However, despite the importance of culture, there has been a problem in delineating specific types of culture which support the achievement of these two performance measures. The cultural content which supports quality performance has not been clearly defined in the previous studies (Waldman, 1994). Similarly, studies on the link between culture and innovation performance have not effectively utilized the established model of organizational culture. This paper attempts to fill this void by examining the possible contrasting nature between quality and innovation as manifested in the different dimensions of organizational culture.

**COMPETING VALUES FRAMEWORK AND ITS RELATIONSHIPS WITH QUALITY AND INNOVATION**

The conceptual framework of organisational culture used in this paper is the Competing Values Framework (CVF), which was developed by Quinn and Spreitzer (1991). The CVF captures four contrasting cultural dimensions. These dimensions are represented by two axes with each representing
a superordinate continuum. The first dimension is the flexibility – control axis that describes two contrasting orientations, between that which reflects flexibility and spontaneity and that which reflects stability and control. The second dimension is the internal – external axis that also describes two orientations with one being oriented towards maintenance and improvement of the existing organization and the other being focused on adaptation and interaction with the external environment. The combination of the two dimensions results in four quadrants of cultural dimensions, namely group, developmental, hierarchical, and rational.

The juxtaposition of the different cultural dimensions based on control versus flexibility and external versus internal has considered in the organisational research literature, particularly their role as a driver of organisational performance (Detert et al., 2000). In this study, the dimensions of flexibility and control is important for testing the arguments which imply that contrasting underlying cultures between quality versus innovation. This issue has raised a theoretical debate whereby the management of quality and innovation were considered as synergistic or antagonistic to each other, as summarised by Prajogo and Sohal (2001). For example, the contrasting management values between Total Quality Control (TQC) and Total Quality Learning (TQL) - suggested by Sitkin et al. (1994) - provide theoretical supports for the antagonistic nature between quality and innovation. TQC which promotes stability, regulatory standards, and routine processes is suitable for achieving quality by conformance. On the other hand, TQL which is associated with learning, novelty, and risk-taking is effective for pursuing innovation. Quality imposes strict control and standardisation on processes whilst innovation requires freedom and flexibility to release creativity and ideas. Quality is also more focused on satisfying the existing needs of customers and thus demands clear specifications from customers. Innovation, on the other hand, creates new demands among customers. In short, quality is more driven by a control approach, whilst innovation is more flexible-oriented.

Whilst control and flexibility reflect the contrast between quality and innovation, the internal and external orientations of the CVF reflect the distinction between product and process. Product in this study is defined as a physical good or service delivered or rendered to customers, whilst process is defined production or service operations which produce the product or service. Since product is designed and produced to serve customer needs, it has to carry an external orientation, commonly
termed as market orientation or customer focus (Kohli and Jaworski, 1990; Lengnick-Hall, 1996). Process, on the other hand, aims to achieve high efficiency in producing products or services, hence, more internally focused (Abernathy and Utterback, 1988). Therefore, in defining quality, product quality is defined as conformance to customer needs whilst process quality is defined as conformance to specification. In the innovation area, the importance of distinguishing product from process is mainly because each of them requires different organisational skills (Damanpour and Gopalakrishnan, 2001), which could be rooted from the contrasting underlying cultural orientations, between external and internal.

In summary, the above discussion has highlighted the contrasting types of organisational culture based on the two dimensions: between control and flexibility orientations which reflect the contrast between quality and innovation, and between external and internal orientations which reflect the distinction between product and process. Despite this internal – external distinction, however, the dividing line between product and process are often blurred (Sciulli, 1998; Tidd et al., 2005). Also, the achievement in product performance (in terms of quality or innovation) could spill to process performance, and vice versa (Tornatzky and Fleisher, 1990). Therefore, we contend that the distinction between internal and external is less ‘discrete’ than the contrast between flexibility and control. Consequently, the following hypotheses are posed:

**Hypothesis 1**: Rational culture which is oriented towards control and external is positively related to product quality and process control

**Hypothesis 2**: Hierarchical culture which is oriented towards control and internal is positively related to process control and product quality

**Hypothesis 3**: Developmental culture which is oriented towards flexibility and external is positively related to product innovation and process innovation

**Hypothesis 4**: Group culture which is oriented towards flexibility and internal is positively related to process innovation and product innovation

**Hypothesis 5**: Product quality is significantly correlated to process control over and above the variance explained by their respective cultural dimensions.
Hypothesis 6: Product innovation is significantly correlated to process innovation over and above the variance explained by their respective cultural dimensions.

METHODS

Sample and procedures

Data were obtained through a mail survey of 1,000 managers of Australian firms. Most of these managers held middle to senior positions and had knowledge of past and present organizational practices relating to quality and innovation related aspects in the organization. The sample encompassed various industry sectors, including both manufacturing and non-manufacturing. The focus of this study was limited to one site (or plant) per organization. After removing 150 questionnaires that were returned to sender, a total of 194 managers responded, accounting for 22% response rate.

The proportion of the respondents was nearly equal between manufacturing and non-manufacturing sectors (52% and 48% respectively). In terms of organizational size (based on the number of employees), 90% of the respondents represent firms with 500 employees or less, with around 60% of them representing small-to-medium sized firms (SMEs) with less than 100 employees. More than half of the respondents (58%) were either quality managers or production/operations managers, followed by senior managers (General Manager or Managing Director), which accounted for 35%. The remainder held various managerial positions in finance, marketing, human resources, and administration.

Measures

Organisational culture

The instrument designed by Quinn and Spreitzer (1991) measures each of the four quadrants in the CVF model, as discussed above. Five-point Likert scale was used for measuring the sixteen items which indicate the extent to which the attribute characterises the respondent’s organisation instead of adopting an ipsative method, as used by Deshpande et al. (1993) or Dellana and Hauser (1999). From a methodological point of view, Quinn and Spreitzer (1991) suggest that the ipsative method is not suitable for correlation-based statistical analysis, such as factor analysis and regression, which were
used for the purpose of this study. Moreover, the Likert-scale instrument which they developed for assessing organisational culture met the criteria of validity and reliability (McDermott and Stock, 1999; Quinn and Spreitzer, 1991).

From a conceptual point of view, Denison and Spreitzer (1991) suggest that no organisation is likely to be characterised by only one dimension. Instead, the combination of these four types of culture would be expected to be found - although some types could be more dominant than the others - rather than reflecting only one culture. In other words, each item should be allowed to vary independently from the others, meaning that being strong in flexible orientation will not necessarily prohibit the organisation from also being strong in control orientation.

**Product quality**

In operationalising the measure of product quality performance, the four-item scale used by Ahire et al. (1996) was selected for several reasons. First, its content was derived from the selected items of Garvin’s (1984) dimensions of quality, namely: reliability, performance, durability, and conformance to specification. The Garvin’s dimension would establish content validity of the scale. Secondly, the scale by Ahire et al. shows strong validity and reliability, much superior to those used by Samson and Terziovski (1999) or Grandzol and Gershon (1998).

**Process control**

Process control aims to achieve a high level of quality in terms of degree of conformance to specification. Underlying process control is the cybernetic approach which promotes conformance and minimises variation (Sitkin et al., 1994). The items which reflect process control were derived from several studies (Ahire and Dreyfus, 2000; Anderson et al., 1995; Cua et al., 2001; Flynn et al., 1994). These include standardised working procedures, the use of statistical process control, and review of performance.

**Product and process innovation**

For the purpose of comprehensively capturing the aspects of innovation performance, this study developed a scale for measuring innovation on the basis of several criteria that have been conceptualised and used in the previous empirical studies of innovation, including Cohn (1980),
Miller and Friesen (1982), Deshpande et al. (1993), Avlonitis et al. (1994), Subramanian and Nilakanta (1996), and Hollenstein (1996). These criteria are the number of innovations, the speed of innovation, the level of innovativeness (novelty or newness of the technological aspect of the innovation), and being the “first” in the market. These criteria were reflected in the measure of both product and process innovation, however, in the case of process innovation, the criteria for innovation applied for product were generally used in the context of new technologies adoption rather than something that firms deliver to markets.

**DATA ANALYSIS**

**Scale validity and reliability**

As a first step, data reduction was run to convert the items in each scale into a single composite score. This followed the methods employed in the studies by Flynn et al. (1994), Samson and Terziovski (1999), and Meyer and Collier (2001). The items assigned to each of the eight scales were subjected to principal component analysis to examine construct validity. The construct validity of these eight scales produced good results except in the case of hierarchical culture where one item (i.e. control and centralisation) was deleted due to weak loading. This result repeated the experience of McDermott and Stock (1999) who also had to exclude this particular item from the analysis. The final eight scales exhibited strong reliability as indicated by Cronbach’s alphas that passed the cut-off point of 0.7 (Nunnally, 1978). The final results of the construct validity and reliability are presented in Table 1 below.

[Insert Table 1 about here]

Since the data set was drawn from a single respondent in the organization, common method variance needs to be checked to ensure that the data had no major problem with response-bias. The test for checking common method variance used in this study was Harmann’s single-factor test suggested by Podsakoff et al. (1986). This test was run by loading all 32 remaining items into a principal component analysis and examining the number of factors extracted from these items. The result indicated that six factors were extracted from the un-rotated solution. This result was double-checked by forcing the 28 items into one factor, and it produced poor result as indicated by only 35%
variance extracted and many items suffered from poor factor loadings which fell below 0.5. These results suggest that common method variance was not a significant problem in the data set.

Once the scale validity and reliability was completed, factor scores were calculated from the remaining items to generate the composite scores for each of the eight constructs which were used in the next stage of the analysis. MANOVA was also performed to check any differences in the eight variables between manufacturing and services firms and between SMEs and large firms. The results indicated that there was no statistical difference between two different industries and between two different sizes. Therefore, it is appropriate to run the analyses using the sample as a whole.

**Preliminary correlation analysis**

As a preliminary step in the analysis, bivariate (Pearson-\(r\)) correlations were calculated among the seven composite variables (factor scores). The results of this analysis are presented in Table 2. As shown, the correlation coefficients among the four cultural variables were reasonably strong (around 0.6), except for those involving hierarchical culture.

[Insert Table 2 about here]

These findings, therefore, support the coexistence of different types of cultures within an organisation, even among those seemingly antagonistic to each other (i.e. those sitting diagonal to each other). These correlations, however, did not reach a magnitude which would create a problem of multicollinearity among the independent variables that may confound the results of path analysis (Tabachnick and Fidell, 2007).

**Path Analysis**

The six hypotheses posed in this study (four relationships between culture and performance and two correlations between performance measures) were tested simultaneously using path analysis. The initial model, however, indicated a poor fit. The chi-square value was overly high compared to the degree of freedom and RMSEA was well above the acceptable cut-off point of 0.08 (Hair et al., 1998). Given this situation, model generation approach was used to complement the pure confirmatory approach to improve the model. In doing so, the non significant paths were deleted and modification indices were checked to see if any additional paths were suggested to improve the
overall fit of the model, provided they had a theoretical sense (Joreskog and Sorbom, 1993). The modified version of the relationships improves the model’s fit significantly as indicated by several fitness indices. In particular, the chi-square value dropped significantly against the degree of freedom, the non-significant p-value (>0.05) and RMSEA now sits well below 0.08. The final model of the path analysis is presented in Figure 1.

[Insert Figure 1 about here]

Developmental culture relates to both product and process innovation, and rational culture relates to both product quality and process control; thus, hypotheses 1 and 3 are fully supported. Group culture only relates to process innovation and hierarchical culture relates to process control as two paths were deleted (group – product innovation and hierarchical product quality) due to non-significant relationships. Therefore, hypotheses 2 and 4 are partially supported. As suggested by modification indices, two relationship paths (between developmental and product quality and between group and process control) were added.

The correlation between product and process innovation is significant at p<0.01, and so is the correlation between product quality and process control, hence supporting hypotheses 5 and 6. As suggested by the modification indices, one correlation (between product quality and process innovation, significant at p<0.01) was added. These three correlations were verified using partial zero-order correlation when all the independent variables (i.e. the four cultural dimensions) were controlled for (Bagozzi, 1980). The results show that the three correlations were significant at p<0.01.

DISCUSSION OF THE FINDINGS AND THEIR IMPLICATIONS

The key findings of the path analysis are discussed here. First, the findings revealed the unique roles of the four cultural dimensions in predicting different types of performance as predicted by the hypotheses. This finding therefore supports the importance of understanding the dimensionality of organisational culture as organisational resource in contingent (as opposed to universal) to different competitive performance (Detert et al., 2000). From managerial perspectives, the findings help firms identify the specific cultural dimensions they need to develop in relation to their competitive
dimensions, hence, preventing them from simply mimicking other firms’ values or behaviours (no matter how successful they are) without clearly understanding the strategic context of the values.

The additional path between developmental culture and product quality, whilst not initially hypothesised, provides further insight because whilst product quality has to be customer focused, it also requires certain elements of flexibility. This is because customer needs and expectations keep changing and therefore the criteria embedded in the quality of products needs to be revised from time to time (Slater and Narver, 1998). In this regard, flexibility in dealing with these changes is required.

The additional path between group culture and process control is also surprising. However, in the light of TQM theory, it is plausible to find that certain practices which reflect group culture, such as employee participation and empowerment, would have a significant relationship with the process for achieving high quality performance.

Overall, whilst the first four hypotheses are supported (fully or partially), the findings challenge the mutually exclusive standpoint between control and flexibility. Instead, they support the balanced view on what seems to be contrasting cultural orientations within organizations, and consider them as complementary rather than competing (Bolwijn and Kumpe, 1990). In a bigger picture, the findings lead to the idea of managing paradoxes in organisations (Handy, 1995; Thompson, 1998) which concur with the views on the need for developing contrasting cultures and capabilities, such as control and flexibility (Jassawalla and Sashittal, 2002), mechanistic and organic (Spencer, 1994), and exploitation and exploration (Benner and Tushman, 2003).

The correlations among the dependent variables indicate the cross-fertilisation between different types of performance, meaning that high performance in one area will lead to high performance in another area. The additional correlation between product quality and process innovation, although not initially hypothesised, is supported by the idea of process improvement (incremental innovation) in improving product quality, particularly in achieving high conformance to specification (Gobeli and Brown, 1993; Imai, 1986). The overall implication of this finding suggests that it is possible for organisations to achieve a high level of performance across various dimensions of competitive performance (including quality and innovation) and, indeed, only those who can achieve this cumulative performance will prosper (Flynn and Flynn, 2004; Flynn et al., 1999; Noble, 1995).
CONCLUSION AND LIMITATIONS

This study has exhibited several major findings. First, the different roles of different types of cultures exemplify the uniqueness of the two dimensions captured in the CVF model. Product and process reflect the differences between external and internal orientations, whilst quality and innovation signify the contrast between control and flexible orientations. Second, despite their unique roles in predicting different types of performance, these different types of culture can coexist within an organisation. Third, the correlations among the four dependent variables support the cumulative view of competitive performance in organisations. The pursuit of multi competitive dimensions provides further supporting arguments on the need for nurturing multidimensional organisational culture. From a theoretical point of view, this study shows the use of CVF model to explain the multidimensionality of cultural characteristics which underlie different dimensions of performance in organisations as well as extending the previous empirical studies on a similar topic (e.g. Stock et al. (2007) and McDermott and Stock (1999)). On the practical front, the specific relationships between different cultural dimensions and performance provide directions for managers to appropriately understand the fit between the culture and the strategic direction of the firm. Only after understanding the cultural dimensions of the firm, managers can address the issue of cultural strength (Sorensen, 2002).

It is suggested that future studies on the similar topic use multiple respondents to assess organizational culture to check the consensus among organizational members. Also, we suggest the use of multi-level analysis where the observations can be made at the organisational level and the sub-organisational (departmental or divisional) level, especially in large organisations, to see if there are differences in cultural dimensions within sub-organizations due to different nature of works.

Finally, despite the significant effect of culture on performance, organisational culture in its own right is not sufficient to explain the variance of firms’ performance comprehensively. There is myriad of other organisational factors which are not captured in this study which have significant effect on performance, including firm’ technological status, financial leverage (i.e., debt-to-equity), operating leverage (i.e., slack), diversification, environmental dynamism. Not less important is to examine how culture is reflected in tangible practices in affecting organisational outcomes.
REFERENCES


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* Significant at p<0.05
** Significant at p<0.01

Chi-square = 14.47  d.f. = 11  p-value = 0.21  NFI = 0.99  CFI = 0.99  GFI = 0.98  SRMR = 0.04

**Figure 1 The final path diagram of the relationship between organisational culture and performance**