

Exploring the Relationships among Transformational Leadership, Organizational Culture and Product Innovation using PLS-SEM

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Abstract—Product innovation refers to new products development and improvement of existing products. The importance of product innovation proliferated as the market grows and becomes more diversified. Among SMEs, product innovation is one of the most critical determinants for their survival, growth and competitiveness. Nonetheless, product innovation among SMEs is still low, owing to various issues and challenges. This study attempts to focus the effect of transformational leadership and organizational culture on product innovation among thirty-six SMEs in Johor. A SEM-PLS was used to validate the measurement model and develop the path modeling among variables studied. It is found that both transformational leadership and organizational culture are significantly related to product innovation. This finding substantiates previous findings and lends supports to the importance roles of both constructs in SME's development.

I. INTRODUCTION

Innovation studies among small and medium enterprises (SMEs) has increased considerably in the past few years (for example [1], [2], [3] and [4]). Such interest is attributed to the pivotal roles played by the SMEs in terms of national economic growth and sustainability. Earnest governmental efforts to stimulate innovations among SMEs are evident in various policies and incentives provided to innovative SMEs such as Innocent award.

Despite these concerted efforts to stimulate innovation among SMEs, level of innovation among SMEs is still low [5]. The National Survey of Innovation (NSI) carried out by the Ministry of Science, Technology and Innovation, Malaysia (MOSTI) in 2003, found that majority of small enterprises are non-innovating firms with 74.1% out of 482 enterprises. About forty-nine percent of medium enterprises is classified as non-innovating firms. These figures signify pressing issues on how to stimulate more innovative SMEs especially when there is substantial empirical evidence that innovation is significantly correlated with organizational performance [6][7]. Furthermore, Bagchi-sen [8] claimed that SMEs who pursue product innovation are better performers in terms of export and total sales.

There are various factors claimed to stimulate innovation such as firm size and age of firms [5], market situations and internal practices [3], TQM practices [4], and external

environment [9]. However, this study concurred with McMillan [10], who argued that internal factors such as leadership and organizational culture are more important compared to external environment. In addition, the organic nature of SMEs and pervasive role of SMEs' owner-managers have been argued as critical factors that foster innovation among SMEs [11] [12] [10]. Thus, this study aimed to examine the effects of transformational leadership and organizational culture on product innovation among SMEs in Johor State of Malaysia.

The outline of this paper is as follows. Section 2 presents literatures on transformational leadership, organizational culture and innovation which eventually lead to the formulation of research hypotheses. Section 3 presents the methodology while Section 4 reports the results. Section 5 continues with discussion and conclusion.

II. LITERATURE REVIEW

Innovation studies have been approached at various levels which include national, organizational and individual levels (for example [13] [14] due to inherent interactions amongst these levels. Diverse conceptualizations of innovation ranging from products and services [15], marketing and strategic [16] to employee innovativeness [17], have also been observed. These varying levels of analysis coupled with different conceptualizations of innovation have been paradoxical. Although these studies have enriched the growing innovation literatures, they also obscure in-depth understanding of the topic. Thus, in the context of this research, innovation refers to only product innovation where it entails both new product development and incremental product improvements where the level of analysis would be organizational level. Resource-based View (RBV) would be the structural model of this study with formulation of hypotheses be based on previous empirical findings as follows;

A. Transformational Leadership and Product Innovation

The impact of leadership on product innovation is rested on how the SME's owner-manager strategizes and mobilizes the firm's resources. The concept of transformational leadership goes beyond this by developing mission, building employees' commitment towards the mission by role modeling and

internalization of values, and encouraging employees' creativity to produce more product innovation. Empirical evidence of the positive effects of transformational leadership on product innovation has been consistent albeit the difference in context.

For example, Saad and Mazzarol [18] reported that transformational leadership style significantly influences both product and process innovation in their study examining the impact of leadership on innovation among Small and Medium Enterprises (SMEs) within Malaysia's Multimedia Super Corridor (MSC). Similarly, Matzler et al. [19] studied the effect of transformational leadership on product innovation and performance among innovative SMEs in Austria and found that transformational leadership has positive impact not only on product innovation, but growth and profitability. Samad [20] surveyed 150 managerial staffs in logistic companies and found that transformational leadership is not only predictive of product innovation but also organizational performance. Gumusluoglu and Ilsev [21] also discovered consistent result when they investigated the effect of transformational leadership on creativity and organizational innovation among micro to small-sized Turkish software development companies. Based on these studies, a hypothesis is formulated as follows;

H₁: There is a significant relationship between transformational leadership and product innovation

B. Organizational Culture and Product Innovation

Organizational culture acts as a binder to guide collective employees behaviors based on the organizational norms and values. SMEs that encourage innovation would integrate different facets of organizational DNA to promote creativity, risk taking and stimulate employees' involvement. Since SMEs usually has a strong organizational culture due to their smaller sizes, the influence of organizational culture on product innovation is expected to be higher.

Tajudin et al. [22] investigated the effects of organizational culture, market orientation and innovativeness towards new product performance among SMEs. Using a mixed method approach, they found that organizational culture is not significantly related to new product performance in the survey phase of 65 respondents. However, this research was carried out among SMEs who are involved in R&D activities. Valencia et al [12], on the other hand, used structural equation modeling to analyze 420 responses from organizations which have more than 25 employees in Southern Europe. They found that product innovation is positively associated with adhocracy culture and has negative relationship with hierarchal cultures. Adhocracy culture characteristics include creativity, empowerment, freedom and autonomy and risk taking, which in essence parallel with the Denison Model of Organizational Culture. It is hypothesized that;

H₂: There is a significant relationship between organizational culture and product innovativeness

C. Transformational Leadership and Organizational Culture

Theoretical literatures suggested that organizational culture is derived from leadership [24] [25]. Bass and Avolio [24]

claimed that transformational leaders revive the organizational culture by aligning it with a new vision and prepare it for desirable organizational change. Nonetheless, empirical studies revealed inconsistent findings on their relationships. Although Block [25]; Choi and Sagas [26] and Lucas and Valentine, [27] found significant relationship between transformational leadership and organizational culture, However, Ridgway [28] found no relationship. However, since the number of studies with positive significant relationships are greater, this study hypothesized;

H₃: There is a significant relationship between transformational leadership and organizational culture.

The framework of this study is depicted in Figure 1.

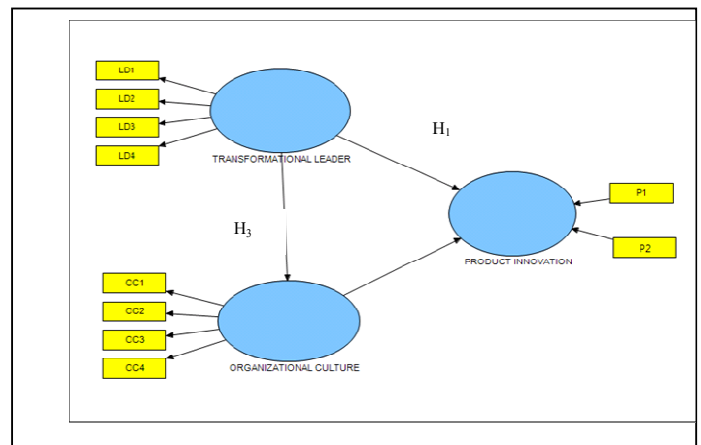


Fig. 1. Structural Model of Transformational Leadership, Organizational Culture and Product Innovation

III. METHODOLOGY

This research employed explanatory research design with survey as major data collection technique. The selection of the research design was based on the nature of the research objectives that involved hypothesis testing and the need to observe the phenomenon in its natural setting.

A. Sample and Procedure

Thirty-six mixed performing SMEs participated in this study from a sampling frame of forty-five which yield a return rate of 89% which exceeded the common return rate range of 50 percent to 80 percent [29]. The sampling frame was taken from the SME Corporation list of registered SMEs located at two industrial parks in Johor.

The respondents are mostly Chinese (46.9%), followed by Malay (37.5%), Indian (12.5%) and Others (3.1%). Most of them are between 35-45 years old (53.1%) with only 12.5 % more than 46 years old. Majority of them had degree or higher (43.8%), followed by high school certificates (28.1%), diploma (18.8%) and only 9.4% with secondary schooling only.

B. Instruments

Two established instruments which include Leadership Questionnaires (MLQ-5X) and Organizational Culture Survey (OCS) were utilized in this study. Multifactor Leadership Questionnaires (MLQ-5X) was used to measure transformational leadership while Denison's Organizational Culture Survey (OCS) was used to measure organizational culture. Product innovation items were self-developed to reflect two major categories of product innovation which are new product development and incremental product development.

C. Analysis

A structural equation modeling (SEM) analysis using a Partial Least Squares (PLS) technique was used to test the structural and measurement of the theoretical model that was postulated earlier in the study.

IV. RESULTS

Table 1 shows the descriptive statistics, measurement model reliability, validity, and correlation matrix. The mean for transformational leadership dimensions ranged from 3.726 to 3.805 while the dimensions of organizational culture had mean from 3.687 to 3.960. The mean of new products was 3.468 (SD=0.873) and product improvements was 3.631 (SD=0.651). These results indicate that SMEs involved in more product improvement activities compared to new products.

The measurement model indicates that all construct are reliable (> 0.7) in terms of both composite reliability (CR) and Alpha's Cronbach (AC) [30][31]. Convergent validity of the constructs was gauged by the factor loadings and average variance extracted (Hair et al, 2010). The loadings of all items and average variance extracted (AVE) exceeded the recommended value of 0.5. The AVE for each construct is greater than the squared correlations of other constructs which implies adequate discriminant validity [32]

TABLE 1: Measurement Model Reliability and Validity

	Items	Loading	Mean	SD	AVE	CR*	CA	Correlation		
								TL	OC	PI
Transformational Leadership	II	0.917722	3.726	0.418	0.721	0.911	0.869			
	IM	0.811098	3.792	0.569						
	IS	0.917927	3.757	0.42						
	IC	0.735475	3.806	0.444						
Organizational Culture	INV	0.830634	3.96	0.31	0.755	0.925	0.892	0.489		
	CON	0.879826	3.687	0.437						
	ADP	0.877897	3.792	0.436						
Product Innovation	MSS	0.885425	3.841	0.46						
	NEW	0.9674	3.468	0.873	0.952	0.965	0.927	0.524	0.505	
	INCR	0.963299	3.631	0.651						

Notes: *Calculated using Fornell & Larcker's (1981) method.
The bold diagonal elements are the square root of the variance shared between the constructs and their measures (no such measure exists for the single-item constructs)
SD: Standard Deviation; CR: Composite Reliability; CA: Cronbach's Alpha

Table 2 shows the path coefficients of the structural model. The structural coefficient between transformational leadership and product innovation is significant ($t > 1.96$) with direct effect of 0.181. Thus, H_1 fails to be rejected. The structural coefficient between organizational culture and product innovation was 0.327 ($t > 1.96$). Therefore, H_2 is accepted. The structural coefficient between transformational leadership and organizational culture is significant with direct effect of 0.489 ($t > 1.96$). Thus H_3 is accepted. Thirty-six percent of variations

in product innovation are explained by transformational leadership and organizational culture.

TABLE 2: Path Coefficient

Path	Hypotheses	Std Mean	Std Dev	Std Err	t Statistics	Path Coefficient	R ²	Inference
LEADERSHIP -> PRODUCT INNOVATION	H ₁	0.365	0.101	0.101	3.617	0.364	0.356	Supported
CULTURE -> PRODUCT INNOVATION	H ₂	0.323	0.070	0.070	4.649	0.327		Supported
LEADERSHIP -> CULTURE	H ₃	0.479	0.074	0.074	6.653	0.489	0.24	Supported

* Significant at level $p < 0.001$.

V. DISCUSSION AND CONCLUSION

The positive effects of transformational leadership and organizational culture on product innovation not only substantiate previous findings but also highlight the importance of both constructs to be further scrutinized in SMEs development agenda. Since participated SMEs are not contrived in any particular industries, the implication of this study is compelling. SMEs owner-managers' leadership style seem to have myriad of positive effects not only on organizational culture but also the product innovation. As argued by A.Zafer Acar [11], abilities to differentiate product through innovation would enhance business performance. Transformational leaders should be able to marshal organizational resources and appeal to employees' commitment to produce more product innovations. Organizational culture which focuses on innovation would further accentuate the leadership commitment and aspiration.

Future studies should investigate whether the organizational culture mediates the relationship between transformational leadership and product innovation since there is a significant relationship between transformational leadership and organizational culture. The small sample size of this study necessitates further replications with larger sample size. Realizing many potential limitations of this study, any generalization should be done cautiously.

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