THE MEDIATING EFFECT OF TQM PRACTICE ON COST LEADERSHIP STRATEGY AND IMPROVEMENT OF PROJECT MANAGEMENT PERFORMANCE

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ABSTRACT

This study investigates the relationship between cost leadership strategy, total quality management (TQM) practices, and improvement of project management (IPM) performance. Based on a literature review, six main hypotheses and a theoretical model are developed on how these three domains are linked together. A data set collected from 128 mid to senior-level managerial employees of Malaysian engineering firms is utilized to validate the theoretical framework. The findings show that cost leadership strategy does not have a direct impact on IPM, consequently, it affects through the full mediation of TQM practices.

KEYWORDS: Total quality management; project management; Cost leadership strategy.

INTRODUCTION

In the recent trend of rapidly changing global business environment, companies tend to be more than ever competitive at the organizational strategy level through dynamic changes. To remain efficient and agile, optimizing the management practices is a main precedence of organizations. There is a link between performance, structure and firm's strategy, with this route that firm's strategy indicates firm's structure, which in turn impacts firm's performance [1]. Porter (1980) suggested "cost leadership strategy" which is attainable through low cost and impacted large number of followed-up researches across various contexts (e.g. Miller, 1988; Brown and Eisenhardt, 2000). These studies have been concentrated on the link between cost leadership strategy and various level of organizational performance.

Total quality management is one form of management practices that has experienced an evolution process on literature from an operational level to a strategic level over the past two decades. Thus far, mixed outcomes of TQM implementation has been reported towards improving organization's performance such as process improvement [5].

Project management is another form of management practice that has been applied as a concept to reach strategic objectives by increasing number of firms [6]. Incorporating

operational structure with competitive strategy is important for effective performance of project management [7].

Many researches have been done in TQM practice, project management performance, cost leadership strategy and their relationship with firm's success; nevertheless, there has been a lack of focus on how these three constructs are linked together. Therefore, given that organizational, operational, and project management practices are at three separate levels, the understanding of how improvement of project management is related with TQM elements and cost leadership strategy, may be beneficial.

THEORETICAL BACKGROUND

Improvement of project management (IPM)

Executing a project within a targeted schedule, budget, and performance is the generic purpose of project management. Multiple factors such as life cycle level of business scope, top management support, organizational culture, and various degrees of flexibility and formal controls methods during project execution impact project success. Improvement of project management performance can be described as the organized, planned and systematic process of incremental, ongoing, and organizational-wide change of existing practices [8].

Total quality management (TQM)

Total quality management is a systematic quality approach to contribute toward sustained improvement of firm's performance in terms of profitability, productivity, quality, and customer satisfaction [9]. Earlier research works have demonstrated how TQM implementations influence organizations' performance, although mixed success outcomes have been reported [10,11]. Since the start of the "Malcolm Baldrige National Quality Award (MBNQA)" framework in 1995, numerous studies classified TQM practices elements into two categories: the technical system, and the management-system. Samson and Terziovski (1999) conducted a practical approach to determine elements of TQM practices – process/product management, supplier/customer relations, leadership and employee relations - that are more forcefully linked to operational success.".

Product/process management

Methodologies of product design (e.g. standardization) improve process design. Improvement made in process design (e.g. simultaneous engineering) complements the product design. From the TQM perspective, process management and product management supplement to each other during production process, although these two elements involve different technical and managerial tools [9]. Real-time and accurate quality data is a requirement to process and product design, and is a central pillar in performance improvement. The existence of reporting systems and quality data (e.g. display of performance, ERP, and statistical process control) enable firm's improvement of based on statistical and objective scientific methods [9,12]. Therefore, the following hypothesis is proposed:

H1. Process/product management is positively and significantly related to IPM.

Supplier/Customer Relations

Recently, the competitive priorities in many organizations have shifted from simply process quality and product quality to entire supply chain performances [13]. From the supply perspective, supplier involvement, supplier development, and supplier partnerships positively influence the buying organization's operational performance [14]. Customer relations management (CRM) concentrates on how and how well a company distinguishes current and emerging customers' expectations, resulting in customer satisfaction [15]. Due to the recent integrated and computerized trend of SRM/CRM as part of the "Enterprise Resource Program (ERP)", this element is pointed as one element of TQM practice in our framework. Thus, the authors propose the following hypothesis:

H2. Supplier/customer relations are positively and significantly related to IPM.

Employee Relations

The main issues addressed in this construct are how well the employees tie into and are in line with the company's strategic directions. Employee relations involving empowerment, proper compensation and recognition, teamwork evaluation, communication, and training result in better firm's performances [16]. Involving and empowering all employees is essential for making improvement as they will be motivated to work harder and hence more participation in the change process [17]. Employees must be clearly explained about the advantages of TQM practice and sufficiently trained in TQM techniques in order to effectually participate in quality management program [9]. Consequently, the following hypothesis is proposed:

H3. Employee relations are positively and significantly related to IPM.

Leadership

The famous quality pioneer, Juran (1986), considered leadership as the foremost dominant TQM element since it "affects and drives" other TQM elements. This element examines top executives' involvement in setting strategic directions, constructing, and maintaining a leadership system that will facilitate individual development, organizational learning, resulting in high organizational performance. Top management commitment propels TQM by creating organizational culture, values, objectives, and systems that improve organizational performance [19]. Thus, the following hypothesis is proposed:

H4. Leadership is positively and significantly related to IPM.

Cost leadership strategy

Introduced by Porter (1980), cost leadership strategy creates competitive advantage through cutting operational cost and offers an internal orientation, where an organization not only does not neglect quality, strives on cost control, efficient scale operation in order to be the lowest cost provider compared to competitors. Cost leadership strategy specifies the operational structure, which in turn impacts firm's performance [1]. Although cost reduction is not a principle emphasis of TQM, providing quality service and product at a competitive price is focused as a critical part of TQM practice [20]. In addition, from literature seems that project management performance is greatly impacted by management practice, and management practice is impacted by organizational strategy. Consequently, it

can be expected that the impact of cost leadership strategy on IPM takes such a route: cost leadership strategy impact TQM through the execution of this strategy in overall management, and TQM, in turn, identify IPM in the management of a project. Hence, the following hypotheses are proposed:

H5. Cost leadership strategy positively impact on TQM elements.

H6. TQM elements fully mediate the relationship between cost leadership strategy and IPM.

The proposed hypotheses lead us to a theoretical model illustrated in Figure 1.

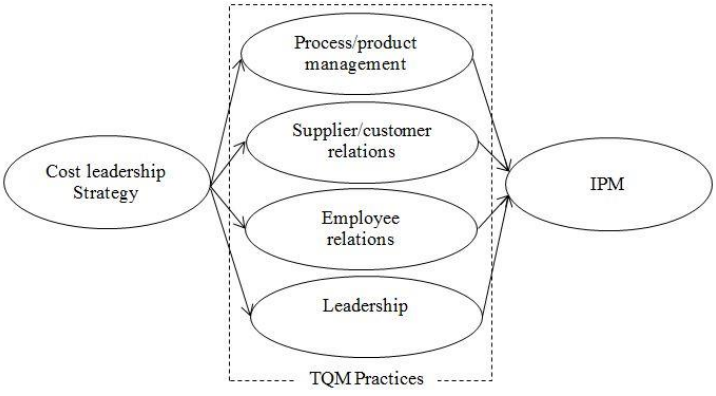

Table 1. Construct validity and reliability

Construct	Items	Factor loadings	R^2	Cronbach Alpha
IPM	I in project management processes	0.836	0.718	0.799
	I in project management system	0.880		
	I in teamwork	0.816		
Process/product management	Scientific method for development	0.88	0.684	0.823
	Evaluation based on quality performance	0.70		
	Availability and use of quality data	0.78		
	Scientific management method	0.86		
Supplier/customer relations	Customer need-based planning	0.76	0.702	0.842
	Supplier capability-based planning	0.79		
	Supplier/customer- based process	0.77		
	Customer satisfaction	0.79		
Employee relations	Employee involvement/empowerment	0.819	0.674	0.743
	Compensation/recognition	0.734		
	Open and transparent communication	0.773		
	Existence of organization-wide training	0.690		
Leadership	Top management commitment to quality	0.870	0.782	0.764
	Existence of clear vision and strategy	0.857		
	Short-term and long-term goals	0.784		
	Unity of purpose	0.725		
Cost leadership strategy	Price cuts when needed	0.892	0.581	0.848
	Lowest cost provider	0.874		
	Cost control system	0.863		

Figure 1. Hypothesized framework.

RESEARCH METHODOLOGY

Instrument & Sample

Data collection methods such as expert interviews, and questionnaire survey were utilized in this study. The questionnaire utilized the measurement scale based on Kendra and Taplin (2004) dimensions for project management performance, Samson and Terziovski's criteria (1999) for TQM, and Miller's scale (1988) for cost leadership strategy. Some of the original items were then modified based on a pilot study in six organizations. The final items utilized in our questionnaire are tabulated in Table 1.

The survey questionnaires were sent to 270 mid- to senior-level managers of organizations that have experience in project management and TQM. A total of 128 questionnaires were received with a response rate of 47.4 percent within a five month period. Approximately 57 percent of the respondents were from organizations with more than 150 employees. About 60.9 percent of the respondents have implemented TQM practice for more than three years. Approximately, 83 percent of the respondents have been engaged in project improvement with the typical project duration of four months to two years. The actual demographics' titles varied among companies from general manager to quality manager; but most of them appeared to be project manager with 31.3 percent out of total respondents' titles.

Validity and reliability tests of constructs

The results showed that the Cronbach's alpha values for all six constructs indicated high internal-consistency reliability by well trespassing the suggested threshold of 0.70 by Hair et al. (1998). Confirmatory factor analysis (CFA) indicated that each item in all the six constructs showed significant factor loadings, demonstrated by their corresponding t-values. In addition, all the factor loadings were above 0.50, which is reasonably acceptable. Therefore, subjected to Hu and Bentler's (1999) criteria, all six constructs support good model fit. R^2 value was measured for each construct. The variance captured for each of the six constructs trespassed the recommended critical point of 0.50. Therefore, the six theoretical constructs show good construct validity. The results of construct reliability and validity tests of the six constructs are tabulated in Table 1.

RESULTS

The theoretical model was tested by SPSS, and the outcomes are illustrated in the Figure 2. The RMSEA value of 0.74 demonstrates a "reasonable fit", according to suggested RMSEA value between 0.05 and 0.08 by Rigdon (1996). According to suggested criteria for model fit indices (NFI > 0.90, CFI > 0.95) by Hu and Bentler (1999), NFI and CFI indicates a close fit in our measures. GFI = 0.87, and the Chi-square value is significant (x^2= 562.75, df = 283, $p < 0.001$). AGFI = 0.819, NFI = 0.93, and CFI = 0.97 are for incremental fit indices. Although AGFI and GFI values are partially lower than the suggested cutoff point of 0.90 by Hu and Bentler (1999), the fit indices of theoretical model are modest when compared to Hu and Bentler's (1999) criteria for model fit indices.

The results pointed out that all four TQM variables, process/product management (β = 0.16, t = 2.39), supplier/customer relations (β = 0.20, t = 3.04), employee relations (β = 0.41, t = 4.36), and top management commitment and leadership (β = 0.22, t = 2.57) seem to make significant and positive contribution towards achieving IPM. Therefore, H1, H2, H3, and H4 are supported.

The results show that cost leadership strategy has non-significant and positive impacts on process/product management (β = 0.09, t = 1.19) and supplier/customer relations (β = 0.07, t = 0.85), while has significant and positive impacts on employee relations (β = 0.25, t = 3.47), top management commitment and leadership (β = 0.23, t = 3.36). The results highlight that cost leadership strategy in general has positive impacts on TQM variables, although some of the impacts are not significant. Consequently, H5 is only partly supported.

The outcomes of the structural model pointed out that cost leadership dimensions impact IPM through the TQM variables. A competing model was developed to further investigate whether the cost leadership strategy has direct influence on IPM in addition to the full mediation via TQM. Thus, the initial model was modified by adding one direct path from cost leadership strategy to IPM. The competing model was tested by SPSS and the outcomes are depicted in Figure 2. For the modified model, all model fit measures, except Chi-square and df, showed the same values to those of the initial model: Chi-square = 555.1, df = 281. However, cost leadership strategy has non-significant and negative impact on IPM (β = - 0.33, t = - 1.74), as showed in Figure 2. Therefore, the direct path coefficient from the cost leadership strategy to IPM is non-significant. Other relationships are being similar to the initial model. Hence, H6 is supported. In other words, cost leadership strategy impacts TQM, which in turn, affect project management performance.

DISCUSSION OF RESULTS

Starting with the relationship between operation-level and organization-level managerial issues, cost leadership strategy is positively related to all the four TQM variables in the hypothesized model. As depicted by pair comparisons of Beta coefficients, the results connote that companies attempting to leverage on “cost leadership strategy” would find employee relations and top management commitment as an effective avenue to attain their strategic objectives; while, the process/product management and supplier/customer relations less effective.

Significant and positive path coefficients between the TQM variables and project management performance show considerable contribution of TQM elements towards IPM. The relative strength effect of each TQM variable toward IPM is ranked in the order of: process/product management, supplier/customer relations, top management commitment, and employee relations, from the weakest to the strongest. In other words, companies involved in project management would find employee relations most useful to attain IPM, though other elements have importance as well.

The findings demonstrate that project management performance is not directly influenced by cost leadership strategy. This suggests that cost leadership strategy must work through a management practice methodology, such as TQM practice, in order to generate significant impact on IPM. Since cost leadership strategy influence IPM through TQM, it is behold that TQM variables play the key mediating role in our hypothesized model.

CONCLUSIONS

We discuss that organizations hoping to improve their project management performance may not find the direct influence coming from adaption of cost leadership strategy at the corporate level. They need to use TQM, as an innovative management

practice, at the operational level in order to affect project management performance. The study suggests that among the TQM elements, employee relations' and leadership have the most contribution towards achieving IPM. Investment made in employee satisfaction, employee development and training, and efficient communication mechanisms can make a significant effect on IPM. Rewards and recognition offered by a firm have a powerful influence on employees' attitudes towards their task which they contribute. Management's commitment to quality through clear vision and strategy, objectives for quality performance, and organization-wide quality culture will facilitate IPM. On the other hand, process/product management and supplier/customer relations seem to make less effect on IPM. This is not suggesting that these elements are not useful, but their direct contributions are less than the other TQM elements. To sum up, TQM is a realization of "cost-conscious" project driven firms. Because, by following TQM, companies not only improve their efficiency and project management performance, but they also offer products and services at a relatively lower cost.

Future empirical studies may define additional TQM elements to our model in order to investigate the multi-dimensional nature of TQM practice. Future work may investigate additional project management performance measures, and may also consider other types of competitive strategy in order to explore the complex nature of organizational strategies, TQM practice, and project management performance link in a broader spectrum.

REFERENCES

[1] Miles, R. and Snow, C. Organizational Strategy, Structure and Processes. McGraw-Hill, New York, 1978.

[2] Porter, M.E. Competitive Strategy: Techniques for Analyzing Industries and Competitors. The Free Press, New York, NY, 1980.

[3] Miller, A. A taxonomy of technological settings, with related strategies and performance levels. Strategic Management Journal 9 (1988), 239-54.

[4] Brown, S. and Eisenhardt, K. Competing on the Edge: Strategy as a Structured Chaos. Harvard Business School Press, Boston, MA, 2000.

[5] Powell, T.C. Total quality management as competitive advantage: a review and empirical study. Strategic Management Journal 16 (1995), 15-27.

[6] Kerzner, H. Strategic planning for a project office. Project Management Journal 34 (2003), 13-25.

[7] Hauc, A. and Kovac, J. Project management in strategy implementation – experiences in Slovenia. International Journal of Project Management 18 (2000) 61-7.

[8] Belout, A. and Gauvreau, C. Factors influencing project success: the impact of human resource management. International Journal of Project Management 22 (2004), 1-11.

[9] Kaynak, H. The relationship between total quality management practices and their effects on firm performance. Journal of Operations Management 21 (2003), 405–435.

[10] Samson, D. and Terziovski, M. The relationship between total quality management practices and operational performance. Journal of Operations Management 17 (1999), 393–409.

[11] Sun, H. Total quality management, ISO 9000 certification and performance improvement. International Journal of Quality & Reliability Management 17 (2000), 168-79.

[12] Ahire, S.L. and Dreyfus, P. The impact of design management and process management on quality: an empirical examination. Journal of Operations Management 18 (2000), 549-75.

[13] Scannell, T. and Vickery, S. Upstream supply chain management and competitive performance the automotive supply industry. Journal of Business Logistics 21(2000), 23-48.

[14] Groves, G. and Valsamakis, V. Supplier-customer relationships and company performance. International Journal of Logistics Management 9(1998), 51-64.

[15] Mithas, S., Krishnan, M. and Fornell, C. Why do customer relationship management applications affect customer satisfaction? Journal of Marketing 69 (2005), 201-9.

[16] Ho, D.C., Duffy, V.G. and Shih, H.M. Total quality management: an empirical test for mediation effect. International Journal of Production Research 39 (2001), 529-48.
[17] Ahire, S.L., Golhar, D.Y. and Waller, M.A. Development and validation of TQM implementation constructs. Decision Sciences 27 (1996), 23-56.
[18] Juran, J.M. The quality trilogy. Quality Progress 19 (1986), 19-24.
[19] Madi, M., and José Tarí, J. The Influence of Soft and Hard Quality Management Practices on Performance. Asia Pacific Management Review 17 (2012), 177-193.
[20] Prajogo, D.I. and Sohal, A.S. The relationship between organization strategy, total quality management (TQM), and organization performance – the mediating role of TQM. European Journal of Operational Research 168 (2006), 35-50.
[21] Kendra, K. and Taplin, L. Project success: a cultural framework. Project Management Journal 35, 30-45.
[22] Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. Multivariate Data Analysis, Prentice-Hall Inc., Upper Saddle River, NJ, 1998.
[23] Hu, L. and Bentler, P.M. Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. Structural Equation Modeling 6 (1999), 1-55.
[24] Rigdon, E.E. CFI versus RMSEA: a comparison of two fit indices for structural equation modeling. Structural Equation Modeling 3 (1996), 69-79.

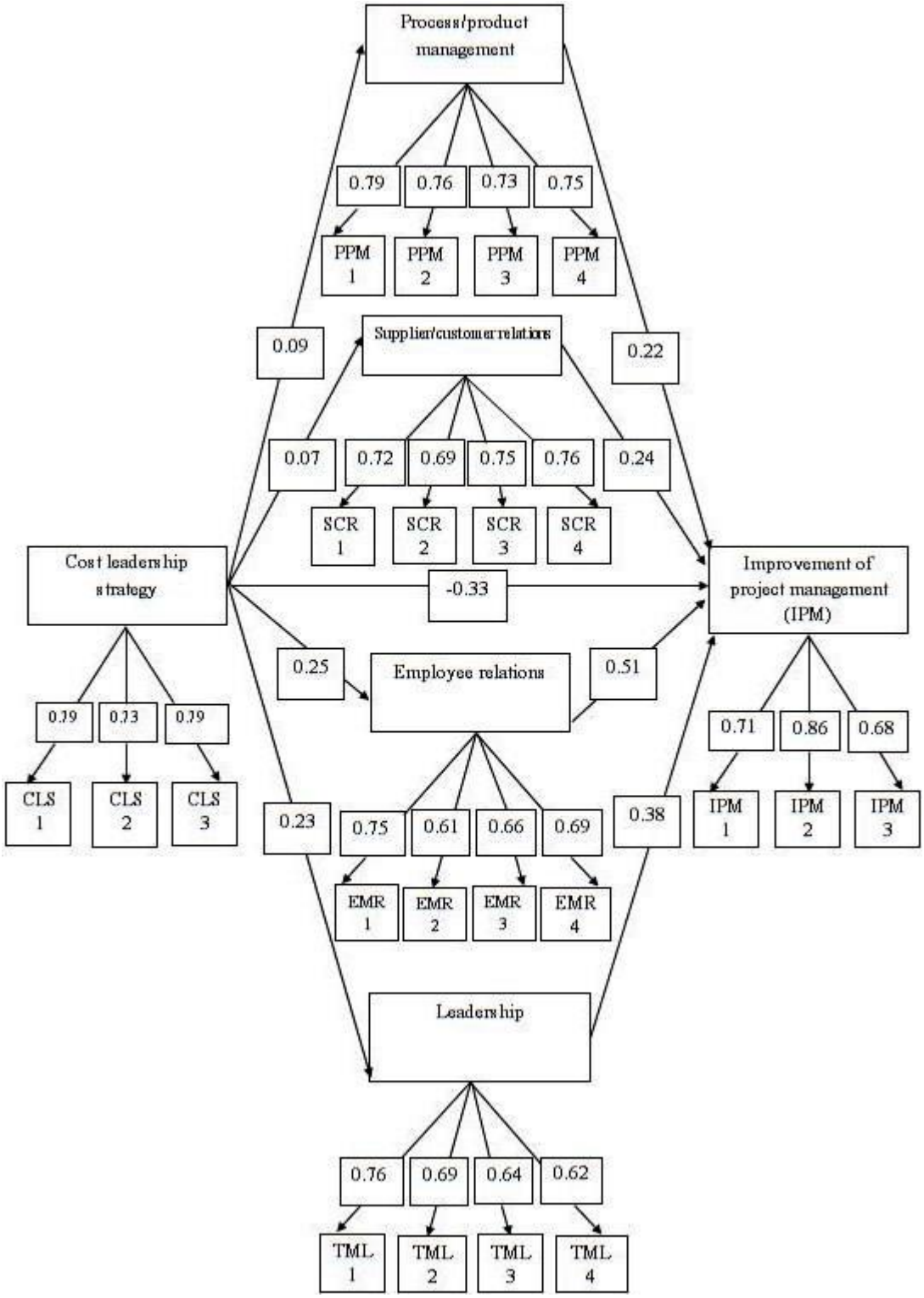

Figure 2. Results of the initial and competing model