



The Effect of Absorptive Capability on Relationship between Total Quality Management and New Product Innovativeness of ISO 9001 International Quality Standard in the Industries Sector, Thailand

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ABSTRACT

Many scholars have suggested that total quality management (TQM) is an important key that pushes innovation. Literature examines the effect of absorptive capability as a mediator of the relationship between TQM and new product innovativeness. However, there are a few studies investigated these relationships. This results draws on the resource-based view theory to examine sixty-two ISO 9001 firms. The finding shows that TQM is positively related to new product innovativeness. More importantly, the result indicated that absorptive capability positively mediated the relationship between both variables. Implication of the finding is meaningful for both academics and management.

Keywords: Total Quality Management, New Product Innovativeness, Absorptive Capability

JEL Classifications: D2, L2

1. INTRODUCTION

In organization, total quality management (TQM) is a tool to management for higher quality product, reduced cost, quality and new product that lead to a company's competitive advantage (Martinez-Costa and Jimenez-Jimenez, 2008). TQM is a method to management by participative problem controlling of managers, employee and customer. Rahman (2004) showed that TQM is management approach of both technical and behavioral lead to organizational performance. Thailand adopted the concept of TQM around 1990 by implementing as ISO 9000 for Thailand's manufacturing industry (Krasachol and Tannock, 2000). The success of TQM has shown on the economic growth and the developing organization (Das et al., 2010). TQM has been recognized to enhance business performance (Clarer-Cortes, et al., 2008). Previous researches have shown the relationship between organizational performance and TQM. However, TQM is an important topic of

development. TQM is related to the creation and use of external knowledge to the enhancement of new product. This study identified absorptive capability as a key success of TQM that influences new product performance. Absorptive capability is an ability process that involves the recognized new external knowledge. Zahra and George (2002) suggested that absorbed knowledge should associate ability of organization to adapt resources to customer's need and respond to change business environment. Some studies emphasized the importance of absorptive capability to manage with innovation and to improve firm performance (Yao et al., 2013; Datta, 2011). Firms have capability to apply new external knowledge which leads to understand and adopt the knowledge for competitive advantage. Thus, absorptive capability provides the basis for innovation that leads to achieve better performance.

The purpose of this research was to develop and to test a theoretical framework for explaining the relationship between TQM and

new product innovativeness with the mediator role of absorptive capability. The focus of this research was to answer how the mediating effect of absorptive capability has a relationship with TQM and new product innovativeness.

In the following sections, a literature review is explained first. Next, description of the methodology for testing of hypotheses frame work is described. Finally, a summary of the research finding is discussed and managerial implication suggested.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

The concept model is shown in Figure 1. The model shows the relationship of (1) TQM and new product innovativeness (2) absorptive capability mediates the relationship between TQM and new product innovativeness.

2.1. TQM and Absorptive Capability

TQM and absorptive capability have relationship and are the sources of value creation. Gutierrez et al. (2012) proposed that firms that have TQM culture such as teamwork and development are related to the absorptive capability of the firm. The relationship of TQM and absorptive capability may play a vital role in knowledge transfer.

Organizations that have TQM practices lead to specially contribute from external knowledge and capability that are able to produce a new product for customer. Therefore, although firms can access organization's knowledge, TQM will help firm to use absorptive capability to transform, and external knowledge for benefit of organization. Thus, the following hypothesis is proposed.

H₁: TQM is positively associated with absorptive capability.

2.2. TQM and New Product Innovativeness

TQM is an organizational system with innovation principle (Kanji, 1996). Linderman et al. (2004) showed that firms provided

knowledge and promoted organizational performance via quality management. TQM created the great of innovation, creativity to response customer demands that integrates managers, employees, and customer (Noe et al., 2000).

Previous studies showed that TQM positively affected innovation. Gustafson and Hundt (1995) demonstrated that TQM were critical factors that included customer focus, management/leadership, quality focus, employee focus, process focus, which are keys to innovation success. For example, Juran (1988) suggested a customer-focused as one of the element of TQM in driving the organization development and new product development to response customers' need. Therefore, product design from the TQM practices creates quality by confirming with the customers' need based on the sources of innovative ideas. Thus, the following hypothesis is proposed.

H₂: TQM is positively associated with new product innovativeness.

2.3. Absorptive Capability and New Product Innovativeness

Absorptive capability is an important key that contributes toward knowledge transfer processes (Enkel and Heil, 2014), which increases a firms' ability in product innovation (Robertson et al., 2012). Cohen and Levinthal (1990) suggested that external knowledge sources are the key to innovation based on organization's experiences and capability. Barney (1991) believed that a firm has to absorb information from internal and external knowledge sources. Zahra and George (2002) demonstrated that great absorptive capability linked with a strong knowledge transfer leads to competitive advantage (Daghfous, 2004). When, a firm has higher absorptive capability overall innovation performance will be increased. Thus, the following hypothesis is proposed.

H₃: Absorptive capability is positively associated with new product innovativeness.

2.4. The Mediating Effect of Absorptive Capability

This study tested the direct effect of TQM on new product innovativeness increasing when considering the indirect effect of TQM upon absorptive capability. Absorptive capability enables to consider new product from new ways of external knowledge by TQM practices. TQM practices help to promote quality performance. The aim of TQM activities such as customer focus, work focus, operation focus are to promote the quality system. Firms that successfully implement TQM can foster knowledge sharing to cross-functional term knowledge transfer (O'Dell and Grayson, 1998). Rothaermel and Deeds (2004) showed that promoting learning from a relationship with external partners positively affected new product development and innovation. Teece (2007) suggested that absorptive capability is the skill of tacit development of external knowledge to benefit the organization. New external knowledge is tacit knowledge process that helps new product development to answer the needs of customers and markets. Based on the argument above, absorptive capability plays the role of mediate variable on TQM which related to new product innovativeness (Baron and Kenny, 1986). Therefore, this study suggested that absorptive capability mediated

Figure 1: The conceptual model

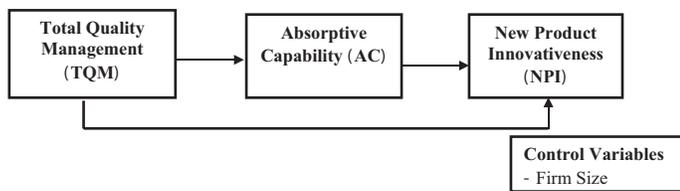
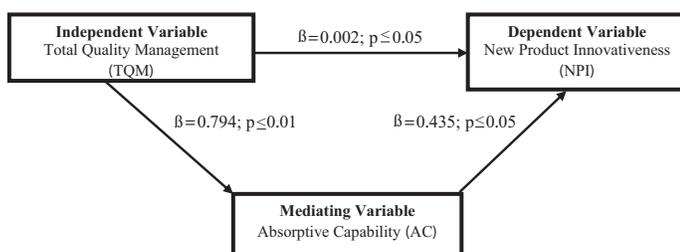


Figure 2: Simplified model of analysis with results

Sobel z-value 2.32920735 significance 0.020



the relationship between TQM and new product innovativeness. Thus, the following hypothesis is proposed.

H₄: Absorptive capability mediates the association between TQM and new product innovativeness.

3. RESEARCH METHODOLOGY

3.1. Sampling and Data Collection

The sample consisted of 500 ISO 9001 International Quality Standard in the industries sector, Thailand. Furthermore, various manufacturing sectors in the summary, included metal, plastic, mechanics, cement, electronic, petroleum, in which firm sizes ranged from less than 25 to more than 2000 employees. The main sampling targets were CEOs, senior managers and general managers who were involved in decision-making. The questionnaire was postal mail for sample of 500 potential respondents. A total of 500 surveys were received and 62 usable responses resulted in response rate of 12.84%. This study conducted several techniques for controlling common method variance (CMV) of Harman's one factor test (Maholtra et al., 2006) by using confirmatory factor analysis. A principal component analysis (unrotated solution) of all the three factors had values above 1 (Variance: 45.94% of 76.07%). Thus, the study concluded that CMV was not problematic.

3.2. Measurement of Reliability and Validity

In this study, the scale for new product innovativeness was adopted from Li and Huang (2012). Among the six dimensions of TQM, the study adopted 30 items scale from Valmohammadi and Roshanzamir (2015). TQM was collectively measured for six dimensions such as leadership, strategic planning, measurement analysis and KM, workforce focus, customer focus, and operation focus. Finally, absorptive capability was defined as the skill that the organization need to deal with the tacit component of external knowledge and the need to modify this capability to the benefit of the organization (Teece, 2007). 6 items adopted from a study by Sheng and Chien (2016) were used to measure absorptive capability. Each item was utilized by a five-point Likert-type scales, ranging from 1 = Strongly disagree to 5 = Strongly agree.

Before data analysis, the Kaiser-Meyer-Olkin test was sufficient at 0.868 to predict whether the factor analysis was perfectly suited to the processing of the variable constructs. The minimum reference value for this test was 0.50 (Hair et al., 2006). Table 1 displays the variable means, standard deviations and zero-correlation matrix for all variables. The correlations among the variables are absent of multi-collinearity. VIF of 1.0 indicates the absence of multi-collinearity and maximum VIF in excess of 10.0 indicated multi-collinearity, in this

Table 1: Correlation matrix

Variables	Mean±SD	Firm size	TQM	AC	NPI
Firm size	3.73±1.62	-			
TQM	4.22±0.53	0.215	0.953 ^a		
AC	4.03±0.69	0.082	0.774**	0.936 ^a	
NPI	3.68±0.76	0.248	0.388**	0.459**	0.918 ^a

***Correlation is significant at P<0.01, **Correlation is significant at P<0.05;

^aCronbach alpha. TQM: Total quality management, AC: Absorptive capability, NPI: New product innovativeness, SD: Standard deviation

study ranged from 1.049 to 2.613 (Hair et al., 2010). Table 2 shows the Cronbach' alpha for each research construct which were higher than the cut-off points of 0.7 (Bagozzi et al., 1991).

4. RESULTS AND DISCUSSION

Table 1 shows a correlation analysis of total quality management and absorptive capability ($r = 0.774, P < 0.01$), new product innovativeness ($r = 0.388, P < 0.01$). Absorptive capability shows a positive correlation with new product innovativeness ($r = 0.459, P < 0.01$). Table 2 and 3 shows the unstandardized and standardized coefficients estimated from the regression model using a bootstrapping method. Following Baron and Kenny's procedure, Step 1 (Table 2/Model 2), the results show that total quality management have a significant effect on absorptive capability ($\beta = 0.794, P < 0.01, R^2 \text{ adjust} = 0.590$). Step 2, tested the relation between total quality management and new product innovativeness ($\beta = 0.348, P < 0.01, R^2 \text{ adjust} = 0.308$). For Step 3, the model 3 includes the mediator to examine that the relation between total quality management and new product innovativeness becomes non-significant (Table 3, Model 3: $\beta = 0.002, P > 0.05$) and the effect of absorptive capability in new product innovativeness was significant (Table 3, Model 3: $\beta = 0.435, P < 0.01, R^2 \text{ adjust} = 0.395$). In addition to following these three steps, the results of the Sobel test suggested that absorptive capability plays a mediating role in the relationships between total quality management and new product innovativeness (Figure 2; $Z = 2.329; P = 0.020$). Accordingly, hypothesis H1, H2, H3 and H4 are thus supported.

The results show that the relationship between total quality management and new product innovativeness is enhanced when absorptive capability is a mediator. The organization which is based on the implementation of TQM in behavior and development will result in firm advantage. The study is consistent with the result of studies of Gustafson and Hundt (1995) who suggested that customer focus, management/leadership, quality focus, employee focus, process focus which elements of TQM were the factors to innovation success. Organization can focus customer need to develop new product (Juran, 1988). Similarly, Prajogo and Sohal (2004) also showed that the manufacturing and services companies have a significance positive on TQM practices and process innovation. TQM is a management of the intangible resources such as human resources, organizational resources, commercial resources and is a management of knowledge as a source of innovation. Therefore, innovation is positively affected if the firm undertakes the implementation of a total quality program which lead to the results associated with quality (Kuemmerle, 1998). TQM practices is one of the factors that positively affected innovation. Roper and Xia (2014) indicated that firm have effectively target to drive the innovation process by its strong internal capability. One method to improve innovation is to increase the knowledge development for absorption. Hence, TQM is crucial to absorptive capability.

Literately reviewed factors are firm's ability to apply new external knowledge (e.g., customers, partners, and universities) to achieve organizational objectives which Nonaka and Takeuchi (1995)

Table 2: Regression step between the mediator and the predictor variable (step 1)

Model	Unstandardized coefficients		Standardized coefficients beta	t	Significance
	B	Standard error			
1					
Firm size	0.048	0.079	0.078	0.609	0.544
2					
Firm size	-0.058	0.052	-0.093	-1.119	0.268
TQM	0.794	0.084	0.794	9.509	0.000

Dependent variable: AC: Absorptive capability, bootstrapping performed 1000 samples. TQM: Total quality management

Table 3: Regression step between the predictor and the dependent variable, controlling the mediator (Step 2 and 3)

Model	Unstandardized coefficients		Standardized coefficients beta	t	Significance
	B	Standard error			
1					
Firm size	0.153	0.077	0.248	1.979	0.052
2					
Firm size	0.106	0.075	0.172	1.424	0.160
TQM	0.348	0.121	0.348	2.875	0.006
3					
Firm size	0.131	0.073	0.213	1.810	0.075
TQM	0.002	0.185	0.002	0.011	0.991
AC	0.435	0.181	0.435	2.399	0.020

Dependent variable: NPI: New product innovativeness, bootstrapping performed 1000 samples. TQM: Total quality management, AC: Absorptive capability

called “cross-leveling.” This suggests that TQM practice is one important factor of a firm’s absorptive capability to acquire, assimilate and profitably utilize new knowledge leading to new product ideas.

5. CONCLUSIONS AND IMPLICATIONS

This framework of study focuses on examining the mediating effect of absorptive capability on the relationship between TQM and new product innovativeness. There are explanations for this result. (1) The theoretical model based on RBV has hypothesizes test via hierarchical analysis (Bootstrapping method), (2) TQM has a significant and positive impact on absorptive capability. (3) TQM has non-significant effect on new product innovativeness when adding absorptive capability in the model. Thus, absorptive capability has fully mediator effect. (4) Absorptive capability has a significant and positive effect on new product innovativeness.

Moreover, the results of this study show practical implications of TQM for management in organization. Organization should development process and train managers for TQM practices. Successfully implemented TQM provides a competitive advantage (Prajogo and Sohal, 2001). TQM is a good key of improving quality leading to innovation process. Easton and Jarrell (1998) suggested that TQM generates high-quality products, reduces costs, increase customer and employee satisfaction, and improves financial performance. However, most previous studies showed that the most influential dimension of TQM such as customer focus, employee involvement, work focus, operation focus are related to organizational performance.

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