THE RELATIONSHIP BETWEEN SOFT FACTORS AND HARD FACTORS OF TQM PRACTICES AND ORGANIZATIONAL LEARNING

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Abstract

This study examinesthe relationships amongsoft factors and hard factors of total quality management (TQM) practices, and organizational learning in Indonesia's ISO 9001registered manufacturing companies. As many as 217 quality managers in Indonesia's ISO 9001 registered manufacturing companies participated in this study. The results of this study found that in Indonesia's ISO 9001 registered manufacturing companies, the higher levels of soft factors lead to higher levels of hard factors and organizational learning. Hard factorsinsignificantly affect organizational learning;therefore hard factors do not mediate the relationship between soft factors and organizational learning.

Keywords: TQM practices, soft factors, hard factors, organizational learning.

1. Introduction

Globalization together with the fast improvement in information technology, have increased competition worldwide dramatically. In response to this challenge, companies adopted a various strategic postures to obtain competitive advantage (Parnell et al., 2003). Some scholars who have adopted a resource-based view of total quality management (TQM) stressed the important role of TQMin facilitating intangible resources (such as knowledge) to maintain a sustainable competitive advantage (Thigarajan & Zairi, 1997; Zakuan et al. 2010).

Organizational learning is one of the main resources to achieve and maintain competitive advantage, efficiency, and growth for organizations (Marshall et al, 2009; Schein, 1996). The organization's ability to preserve, retrieve, and apply new knowledge plays a critical role in organizational learning.OL is defined as developing and implementing new knowledge to change employees' behavior, so that the organization is able to grow through innovation (Aydin and Ceylan, 2009).

Total Quality Management (TQM) practices can be used to promote learning in business settings **(**Love et al., 2000; Moreno et al., 2005; Martinez-Costa &Jiminez-Jiminez, 2008).Kofoed et al. (2002) argued that organizational learning is facilitated by continuous improvement and change-oriented aspects that inherent in the TQM definition. Learning in TQM practices enables organizations to create new markets and enhance their competitive advantage (Crossan, et al., 1999; Ruiz-Moreno et al., 2005).Moreover, organizational learning in TQM practices enables firms to create a unique, rare, or specialized resources (Mosakowski, 1993),and turn resources into sustainable competitive advantage for above average returns (Barney, 1991, 2001).

Much has been written on how TQM practices affect organizational learning(Martinez-Costa &Jiminez-Jiminez, 2008; Choo et al., 2007). However, one major issue that has not been addressed in the TQM practices literatures is how soft factors and hard factorsof TQM practicesinteract and affect organizational learning. This is an important issue which will be studied in this research because the implementation of soft factors and hard factorsof TQM practices have significant implications on organizational learning which is the key element for gaining competitive advantage (Barney, 2001).

In the early 1990s, Indonesia began to have an interest in quality management as influenced by the success of Japan's quality movement. Many Indonesian firms have adopted this market-oriented management as their total quality management (TQM) philosophy in order to enhance their change for survival in the global market.However, there are few literature related to TQM practicesin Indonesia. For example, Amar and Zain (2002) explored the barriers to implementing TQM in Indonesian manufacturing organizations and Rahman et. Al., (2009) studiedTQM in Indonesan manufacturing SME's. Therefore,this study will provide a fresh angle to the important TQM practices literatures which focus on developing countries perspective.

3.Literature Review and Hypothesis Dvelopment

Soft Factors and Hard Factors of TQM Practices

TQM is defined as the ability to deliver excellence products to stakeholders (Karapetrovic, 2003), is a holistic approach in integrating all organizational functions to achieve customer needs and organizational goals (Kumar et al., 2009).In the empirical research, scholars use total quality management (TQM) practices term instead of TQM philosophy or concept because the TQM practices can be measured (Samson &Terziovski, 1999).

TQM practices were differentiated into two aspects: soft factors (behavior aspects) and hard factors(technical or mechanical aspects). The

term hard factors was used to group the factors that lead directly to the improvement of quality performance, while the term soft factors was applied to cluster the factors which support effective use of the hard factors (Flynn et al., 1995). Soft factors areconcern with philosophical or behavioral aspects (Lewis et al.,2006a, b; Zu, 2009). Hard factors consist of tools and systems that are necessary to support the implementation of soft factors (Lewis et al. 2006).

Organizational Learning (OL)

Some scholars define the concept of organizational learning from their own point of views. Huber (1991) pointed out that organizational learning is systematic approach to learning through knowledge acquisition, information distribution, information interpretation, and organizational memory. While Templeton, Lewis, and Snyder, (2002) explained that organizational learning as a set of actions within the organization that intentionally and unintentionally influence positive organizational change a dynamic process of creation, acquisition and integration of knowledge to develop resources and capabilities that improve organizational performance. (Aydin and Ceylan, 2009) defined organizational learning as developing and implementing new knowledge to change employees' behavior, which in turn will strengthen the organization to achieve improved results, adaptability to change, grow through innovation and create result-oriented employees.

Scholars identified organizational learning as a multiphase process that consists of acquiring, disseminating, interpreting, and storing information (Pawlowski, 2003). Huber (1991) identified four contributing constructs that are related to organizational learning. These four contructs areknowledge acquisition, information distribution, information interpretation, and organizational memory. Knowledge acquisition is the process of collecting knowledge. Information distribution refers to the process of sharing information. Information interpretation is the process of creating shared understanding resulting from information distribution and organizational memory refers to the mechanism to store knowledge for future use.

Hypothesis Dvelopment

This research adopted eight Quality Management Systems based on ISO 9000. The ISO 9000 series are in line with the MBNQA criteria (Sila, 2007). Moreover, Sila (2007) explained that ISO-registered organizations would be expected to implement effective TQM practices compared with non-ISO-registered organizations as a result of their orientation towards ISO 9000. Therefore, ISO 9001 certified companies were selected.According to ISO 9000 quality management system (QMS), TQM practices consist of

customer focus, leadership, involvement of people, continuous improvement, mutually beneficary supplier relationship, system approach to management, process approach to management and factual approach to management (ISO, 2010).In this study, soft factors consist of customer focus, leadership, involvement of people, continuous improvement and mutually beneficary supplier relationship while hard factors include system approach to management, process approach to management and factual approach to management. In addition, this study employed Huber's (1991) organizational learning concept (knowledge acquitision, information distribution, information distribution and organizational memory).

3.1 Soft Factors and Hard Factors of TQMPractices

Many empirical findings suggested that there is relationship between soft factors and hard factors. Soft factors such as, management leadership, training, and employee relation have positive relation to quality data reports, product/service design, and process management (Kaynak, 2003). Zu (2009) in the study on 227 quality managers found that soft factors such as top management support, customer relation, supplier relation and workforce management have positive influence on quality information, product/service design and process management (Zu, 2009).

The focus of cutomer focus dimension is the belief that customer orientation is the prime factor for an organization's long-term success in the market place (Deming, 1986). Organization establishes system and process to collect and analyze facts concerning the customers' characteristicsto understanding the customers' need.

Leaders responsible for institutionalize organizational routines, systems and tools to collect data for decision making. Moreover, leaders motivate individuals to adopt the newsystem to their work processes with encouragement and inspiration (Vera &Crossan, 2004), and has responsibility to lead the process of change, continuously translating fundamental values into an organization's procedures, routines, and systems so that an organization can handle newchallenges (Jerez-Gomez et al., 2005).

Employees are the most important component in achieving company's goals (Evan and Lindsay, 2008). In order to contribute to quality improvement employees need system, process to collect and analyze data, and make decision based on the analysis. Employees use the system to identify all processes and become the owner for each process, and contribute to the whole system in cooperation with one another (Mele and Colurcio, 2006). This system will helps employees to improvethe product or service quality on a continuous basis.

The purpose of continuous improvements is to achieve incremental innovation, therefore, continuous improvement needs data to be analyzed

and needs system and process to implement the continuous improvement process. Buyers and suppliers work together as partner and share information to maximize quality improvement (Besterfield et al., 2003).

In the interaction between organization and its suppliers, suppliers will suggest new system and process, and also present new facts so that the organization could maximize its quality improvement results.

Considering the above discussion, the hypothesis is formulated as below:

H1 Soft factors (customer focus, leadership, involvement of people, continuous improvement and mutuallybeneficiary supplier relationship) significantly affects hard factors (process approach, system approach and factual approach)

3.2. Soft and Organizational Learning

Soft factors facilitate many possibilities for employees to understand the dynamic of customer needs (Samson & Terziovski, 1999). Garvin (1993) argued that there is a relationship between continuous improvement and organisational learning. Understanding customer expectations and then translate the customer expectation into product design require learning process (e.g. knowledge acquisition, information distribution, information intepretation, and organizational memory). Leadership provides intellectual stimulation, individualized consideration, and inspirational motivation facilitates the learning capability (Moreno et al., 2005). Leaders have important role in facilitating learning process (e.g. knowledge acquisition, information distribution, information intepretation, organizational memory) in organization. Lopez and his colleagues (2005) found that the human resource practices (e.g. selective hiring, training and development, and compensation) promote organizational learning processes. Continuous improvement consists of activities such as, identification, classification, and analyzing activities (Agrawal, et al., 2006).Therefore, continuous improvement facilitates learning process in organization.Partnership with suppliers supports companies to learn new materials and new production methods to achieve competitive advantage.Thus, the following the hypothesis is proposed:

H2 Soft factors(customer focus, leadership, involvement of people, continuous improvement and mutuallybeneficiary supplier relationship) significantly affect organizational learning (knowledge acquisition, information distribution, information intepretation and organizational memory)

3. 3. Hard Factors and Organizational Learning

Hard Factors provide tools and techniques such as process flow diagrams, tables so that the employees can share the information to the whole member of the organization (Ahire et al., 1995). Ruiz-Moreno, et al (2005) argued that information availability is a driver for organizational learning. Hard factorssuch as factual approach to decision makingcollects information, analyize it and distribute to all of the organization members. Choo et al. (2007) state that structured and standardized practices enable organizational members to consistently work toward the organizational purposes, goals, and strategies.

System approach to management practically leads to the learning process because it helps organization members, as a part of the system, to think themselves as a component of the whole system and enable them to identify all processes and become the owner for each process, and contribute to the whole system in cooperation with one another (Mele&Colurcio, 2006).

Tools used in process approach to management such as, statistical process control (SPC), flowchart, and Pareto diagram facilitate learning process (knowledge acquisition, information distribution, information interpretation and organizational memory). The tools help the organization to explorenew knowledge, distribute it, produce new interpretation and store the knowledge for future use.

Factual approachsupportcompanies to ensure the availability ofhigh quality, timely data and information for all users such as employees, suppliers,customers and business partners (Lee et al., 2003).The employees, suppliers,customers and business partners will analyze this data and information to create new knowledge, and distribute knowledge, interpret it, and then used it to make decisions. Thus, the following the hypothesis is proposed:

H3 Hardfactors (System approch, proceds approach and factual approach) significantly affects organizational learning (knowledge acquisition, information dist5ibution, information intepretation and organizational memory).

Since soft factors have positive influence on hard factors (H1), soft factors have positive effect on organizational learning (OL) (H2) and hard factors have influence on organizational learning (H3), therefore, the following hypothesis is formulated:

H4 Hard factors (process approach, system approach and factual approach) significantly mediates the relationship between soft factors and organizational learning (knowledge acquisition, information dist5ibution, information intepretation and organizational memory).

4. Research Design and Methodology

4.1. Research Design

A quantitative study was conducted to achieve the research objectives proposed. All the items in the questionnaire were measured based onfive-point Likert scale rangingfrom strongly disagree (1) to strongly agree (5). This scale was also pre-tested several times by academics and consultants who were well known to the researcher and it was found to be valid on the basis of this study.

The respondents of this study were quality managers employed at the Indonesia's ISO 9001 registered manufacturing companies. Sila (2007) explained that ISO-registered organizations would be expected to implement effective TQM practices compared with non-ISO-registered organizations as a result of their orientation towards ISO 9000. There were 1.468 ISO 9001 registered manufacturing companies collected from local ISO consultants. The researcher systematically selected 50% of them (734 companies) as a sample, and 217 of the 734 respondents participated in the survey (response rate: 29.66%).

4.2 Instrument and Measurement of the Variables

4.2.1. Quality Management Practices

This research adapted measurements from ISO 9000 Quality Management Systems. Table 1 shows the soft factors dimensions and measurements and table 2 presents the core factors dimensions and measurements.

Table 1. Soft Factors Dimensions and Measurements

No	Soft Factor Dimensions	Measurements
1	Customer Focus (CF)	6
2	Leadership (LE)	6
3	Involvement of People (IP)	6
4	Continual Improvement (CI)	5
5	Mutually Beneficial Supplier Relationship (MB)	6

Table 2. Hard Factors Dimensions and Measurements

No	Hard Factor Dimensions	Meurements
1	Process Approach (PA)	6
2	Systems Approach to Management (SA)	5
3	Factual Approach to Decision-making (FA)	4

4.2.2. Organizational Learning

This study employedorganizational learning measurement developed by Templeton et al. (2002). The Templeton's et al. (2002) measurement consists of 28 items distributed into four dimensions of organizational

learning. Table 3 shows the organizational learning dimensions and measurements.

Table 3: Organizational Learning Dimensions and Measurements

No	Organizational Learning Dimensions	Measurements
1	Knowledge Acquisition (KA)	9
2	Information Distribution (ID)	7
3	Information Intepretation (II)	5
4	Organizational Memory (OM)	7

4.3 Results

4.3.1 Examining the Measurement Model

Measurementmodel fit was assessed through the following measures: convergent validity, composite reliability, discriminant validity, and square roots of average variances extracted (AVE's).

Convergent Validity

Convergent validity shows that indicators load strongly on the intended construct (Gefen & Straub, 2005). Table 4below shows the factor loadings which are above 0.70.It means that the indicators measure the intended construct(Chin, 1998).

Table 4. Factor Loadings

Constructs	Measurements
CF	5
LE	3
IP	5
CI	3
MB	5
PA	6
SA	3
FA	5
KA	9
ID	7
II	5
OM	7

Composite Reliability

Composite reliability is used to examine the reliability of a unidimensional construct. The minimum composite reliability of a variableis 0.7 (Chin, 1998, Hair et al., 2006). Table5 depicts the composite reliability of allconstructs. All of the constructs have composite reliability above 0.7. It means that unidimensional constructs are reliable.

Table 5. Composite Reliability

Constructs	Composite Reliability
CF	0.889
LE	0.846
IP	0.863
CI	0.871
MB	0.872
PA	0.919
SA	0.887
FA	0.847
KA	0.916
ID	0.903
II	0.894
OM	0.865
SOFTFAC	0.785
HARDFAC	0.739
OL	0.933

Discriminant Validity

Two methods that can be used to examine discriminant validity are: cross-loadings and square root of AVEs.Table 6 shows that scale of items of latent constructs cross-load strongly (above 0.5) on the intended construct (in bold).

Table 6. Factor Loadings of Latent Constructs

Constructs	INFRA	CORE	OL	P value
lv_CF	**0.517**	0.270	0.256	<0.001
lv_LE	**0.601**	0.529	0.307	<0.001
lv_IP	**0.676**	0.420	0.441	<0.001
lv_CI	**0.732**	0.791	0.421	<0.001
lv_MB	**0.713**	0.387	0.431	<0.001
lv_PA	0.633	**0.796**	0.357	<0.001
lv_SA	0.485	**0.775**	0.345	<0.001
lv_FA	0.464	**0.699**	0.198	<0.001
lv_KA	0.579	0.461	**0.895**	<0.001
lv_ID	0.512	0.418	**0.889**	<0.001
lv_II	0.508	0.374	**0.876**	<0.001
lv_OM	0.436	0.291	**0.866**	<0.001

Note: lv: latent construct

Table 7depicts the latent construct correlation and the square root of AVE for first order. While table 8reports the latent construct correlation and the square root of AVEfor second order.Table 7 and table 8show that square root of AVE (in bold) is larger than the correlation between that particular construct and any other construct in the model.

Table 7. Latent Construct Correlation and Square Root of AVE (First Order)

	CF	LE	IP	PA	SA	CI	FA	MB	KA	ID	II	OM
CF	**0.788**											
LE	0.255	**0.760**										
IP	0.136	0.222	**0.747**									
PA	0.176	0.221	0.337	**0.833**								
SA	0.197	0.255	0.340	0.386	**0.815**							
CI	0.233	0.280	0.404	0.319	0.451	**0.832**						
FA	0.214	0.322	0.181	0.172	0.134	0.184	**0.805**					
MB	0.235	0.268	0.371	0.312	0.305	0.370	0.178	**0.759**				
KA	0.232	0.341	0.405	0.407	0.317	0.459	0.231	0.418	**0.743**			
ID	0.231	0.257	0.370	0.333	0.339	0.390	0.184	0.395	0.261	**0.756**		
II	0.247	0.288	0.431	0.275	0.309	0.352	0.193	0.324	0.210	0.385	**0.794**	
OM	0.193	0.194	0.349	0.243	0.251	0.281	0.087	0.380	0.381	0.484	0.396	**0.693**

Note: Square roots of average variances extracted (AVE's) shown on diagonal.

Table 8: Latent ConstructCorrelations and Square Root of AVE (Second Order)

	SOFT FACT	HARD FACT	OL
SOFT FACT	**0.652**		
HARD FACT	0.349	**0.703**	
OL	0.578	0.439	**0.882**

Note: Square roots of average variances extracted (AVE's) shown on diagonal.

4.3.2 Goodness of Fit

Table 9 below shows the results of goodness of fit for the model. The results indicated that all the constructs are unidimensional and therefore, the measurement model posited a good fit with the data collected.

Tabel9. Model Fit Indices and P values

	Soft Factors	Hard Factors	Oganizational Learning	Structural Model
APC	0.286[1)]	0.347[1)]	0.325[1)]	0.266[1)]
ARS	0.972[1)]	0.978[1)]	0.984[1)]	0.984[1)]
AVIF	1.347[2)]	1.280 [2)]	1.791[2])	2.141[2)]

[1)]Significant at $p < 0.001$; [2)] good at AVIF<5

4.3.3 Examine the Structural Model (Inner Model)

Figure 1 shows the structural model. In the figure 1,soft factors significantly ($p<0.01$) affect hard factors with standard $\beta = 0.76$. The $R^2 = 0.57$ indicates that soft factors explain 57% of the variance ofhard factors. Soft factors significantly affect organizational learning at p-value <0.01with standard $\beta = 0.62$ and $R^2 = 0.36$. This result shows that 36% of the variance of organizational learning is explained by soft factors. While hard factorsinsignificantly ($\beta = 0.03$ and $p = 0.41$) affect organizational learning.Indirect effect of soft factors to OL through hard factors is 0.022 at

p=0.407 (see table 10). Therefore, hard factorsinsignificantly mediate the relationship between soft factors and organizational learning.

Table 10: Indirect Effect of Soft Factors on Organizational Learning (OL)

Path	Indirect Effect	P-Value
Soft-Hard-OL	-0.022	0.407

Note: SOFT: practices, Hard: core practices, OL: orgnizational learning,

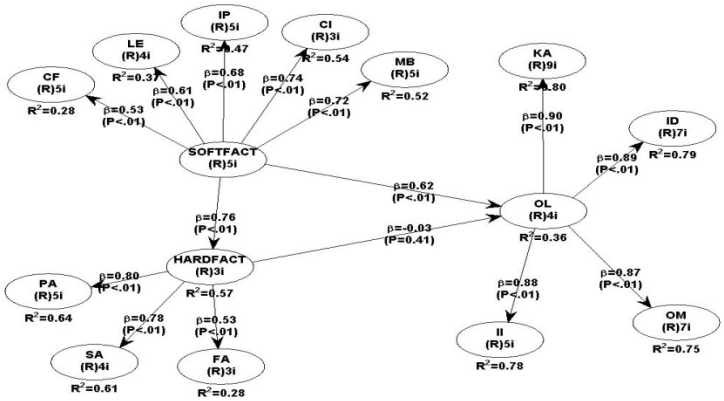

Figure 1. The Structural Model

5. Discussions

The findings of this study show that Soft factors significantly affects hard factors therefore support H1. This results are consistent with the past study (Rahman & Bullock, 2005; Zu, 2009) which reported that soft factors support the implementation of hard factors. It can be observed that soft factors, such as customer focus, leadership, involvelment of people, continuous improvement, and mutually beneficairy supplier relationship support the application of hard factors(process approach, system approach and factual approach).

This research found that soft factors significantly $p<0.01$ and $\beta = 0.62$) affect organizational learning. This result support H2. The result implies that the higher levels of soft factor cause the higher levels of organizational learning.

The study found that hard factors insignificantly ($p = 0.41$ and $\beta = 0.03$) affect organizational learning; therefore, the finding of this study does not support H3. This finding implies that system approach, process approach, and factual approach do not facilitate learning environment. This result is surprising since ISO 9001 certification basically based on standard and procedures which are more technical. This result contradict with

Hackmanand Wageman (1995) argument that hard factors provide tools to facilitate knowledge sharing effectively.

Furthermore, the result of this study also does not support H4. Hard factors insignificantly mediate the relationhsip between soft factors and organizational learning in Indonesia's ISO 9001 registered companies.

These findings implies that intangible or behavior factors of TQM practices (e.g. leadership, customer focus, people management, continuous improvement, and mutually beneficiary supplier relationship) are the influential dimensions on providing learning opportunity for Indonesia's ISO 9001 registered companies.

6. Conclusion

This study has addressed a significant gap in how different TQM practices (soft and hard factors) interact and affect the organizational learningliterature in developing country. This is carried out by formulating and examining a research model linking the multidimensional and mediating relationships between soft factors, hard factors and organizational learning. The results of this study show that in Indonesia's ISO 9000 registered companies, the higher levels of soft factor lead to higher levels of hard factors and soft factors significantly affect organizational learning. The mediation analysis affirms thathard factors do not mediate the relationship between soft factors and organizational learning.

The significant impact of soft factors on organizational learning suggests that the managers could implement the soft factors, such as leadership, customer focus, involvement of people, continuous improvement, mutually beneficial supplier relationshipto improve organizational learning processes which in turn increase the companies' competitiveness.

The limitationassociated with this study is that the data for this reasearch were collected from one key respondent from each company that participated in this study. The respondents may have had limited knowledge and information to evaluate TQM practices and organizational learning activities in their companies.

Further empirical studies need to be undertaken in serviceindustry. The studies in service industry may result different implications on the relationship between soft factors and hard factors of TQM practicesand organizational learning.The results from serviceindusty sector may provide empirical support for the existing results.

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