

STUDY THE IMPACT OF KNOWLEDGE MANAGEMENT STRATEGIES ON FIRM PERFORMANCE AND ENVIRONMENTAL HOSTILITY AS MODERATOR IN INDONESIAN MANUFACTURING FIRMS

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ABSTRACT

This paper attempts to assess the impact of knowledge management strategies on the firm performance and environmental hostility as moderating factor. These studies cover a sample of 192 manufacturing firms. Knowledge management strategies are classified into two dimensions: Codification and Personalization. The findings revealed that knowledge management strategies positively and significantly influence the Indonesian manufacturing firm's performance. Other findings display that environmental hostility has only the moderating effect on the relationship between personalization knowledge strategy and Indonesian manufacturing firm performance.

Keywords: Knowledge Management Strategy, Firm Performance, Environmental Hostility

1. INTRODUCTION

Many of Indonesian enterprises have been categorized as the most admired knowledge enterprise. Moreover, these enterprises have implemented the knowledge management. The results of the recent study clearly showed that manufacturers Indonesia has two dimensions, namely knowledge management strategy oriented explicit knowledge (codified) and tacit knowledge strategy oriented (personalization) and subsequently, both explicit and tacit knowledge complete each other and they are an important component approach knowledge management within their organizations. In addition, the Indonesian manufacturing firms also showed that the influence of the codification strategy (explicitly oriented strategy) on the work of knowledge is higher than personalization strategy (Hasan Alizar, 2008; Hasan Alizar, 2010). Although scholars have suggested that knowledge management in general is critical to the company's performance in contemporary organizations, and few studies on the extent to which specific knowledge management strategies affect performance (Abbas Meazel Mushaf et al, 2011). In addition, few studies

also aimed to determine the moderating effects of environmental hostility on the relationship between knowledge management strategy and firm performance, especially for Indonesian companies.

As we all know that companies are particularly vulnerable to environmental factors, therefore it needs to be investigated environmental contingencies on the relationship between knowledge management strategy and firm performance (Keskin, 2005). Moreover, the influence of environmental factors as moderating variables, should be investigated in the context of large-scale enterprises.

This study will attempt to investigate the relationship between knowledge management strategy and firm performance, and environmental hostility as moderating factor in Indonesian manufacturing firms.

2. LITERATURE REVIEW

This literature review describes theoretical background, knowledge management strategy, firm performance, and link knowledge

management strategy and firm performance where environmental hostility as moderating factor.

2.1 Knowledge Management Strategy

McInerney (2002) says that there are two kinds of knowledge strategy. The first relates to "a supply-side strategy that tends to focus on the distribution and deployment knowledge of the current organization" and the second is "the demand side that focuses on meeting organizational needs for new knowledge". In other words, "the first strategy focuses on knowledge sharing and dissemination, and the second to the innovation of science and mechanics of each generation of knowledge". Furthermore, knowledge can be divided into two types: explicit and tacit knowledge. Both types of knowledge are significant to the organization. In most cases, "knowledge creation depends on the conversion between these types" (Earl, 2002; Haanes & Lowendhal, 1997; Abbas Meazel Mushaf et al, 2011). Explicit knowledge management strategy can be categorized as codification strategy, in which focus to manage, use and store this corporate knowledge assets systematically (e.g., standards, procedures). Whereas, tacit knowledge strategies can also be categorized as personalization knowledge management strategy and it emphasis on "knowledge sharing through mutual interaction, dialogue that supports the sharing of knowledge by one-to-one connection and are manifested through social networking group or team work is used" (Swan, Newell, & Robertson, 2000). Therefore, Hansen and Nohria (1999) investigated several management consulting firms and found two very different knowledge management strategies in place in these firms; a codification strategy and a personalization strategy. The researchers argued that companies should seek either a codification strategy or a personalization strategy in isolation to utilize corporate knowledge most effectively.

2.1.1 Codification Strategy

Codification strategy indicates that knowledge is carefully codified and stored in databases and then accessed and used easily by anyone in the company. The benefits of codification strategy indicate that sharing of codified knowledge can improve task efficiency and also can improve task quality and signal competence to clients (Hansen & Haas, 2001). Faster response to

customers and lower cost per knowledge transaction are main goals of this strategy. With this strategy, it is aimed to increase the codification capability of the firm, thereby, reducing the complexity of access and reuse of knowledge via information technologies. Firms using explicit oriented KM strategy can achieve scale economies and organizational efficiency through reusing codified knowledge (Markus, 2001; O'Dell & Grayson, 1998).

2.1.2 Personalization Strategy

Personalization strategy means that knowledge is closely tied to the person who developed that knowledge and is shared primarily through direct person-to-person contacts. In tacit oriented KM strategy or Personalization strategy context, the emphasize is on sharing knowledge through mutual interactions; dialogues that supports sharing knowledge by one-to-one connections and that eventuate through social networks occupational groups or teams are used (Swan, Newell, & Robertson, 2000). Firms using this strategy protect themselves against being imitated by their rivals through keeping their strategic knowledge such as know-how in tacit form (Schulz & Jobe, 2001).

2.2 Firm Performance

The company's performance can be defined as "the process of quantifying the efficiency and effectiveness of the actions of the past through the acquisition, collection, sorting, analysis interpretation, and dissemination of appropriate information" as stated by Neely (1998, 2005). Performance of the company can be translated in several dimensions, as suggested by most of the literature in the past such as: higher profits, sales volume and market share (Hayes, Wheelwright & Clark, 1988). In addition, sales, asset growth, sales volume and market share growth can be categorized as business performance, and it is the facts which are often found in studies by scholars. In addition, performance indicators can be classified in the form of tangibles and intangible indicators. In this research will be used dimensional manufacturing performance such as profitability, ROI, customer retention, and sales growth as proposed by Powell & Dent-Micallef (1997), therefore, these dimensions can also be

classified as direct and subjective measures of financial and non-financial measurements

2.3 Knowledge Management strategy and Firm performance.

In the empirical research on the relationship between knowledge management strategy and firm performance, in which Keskin (2005) proposed a theoretical model, that classifies knowledge management strategies into two categories, namely explicit and tacit knowledge management strategy. Furthermore, the study results show that tacit and explicit knowledge management strategies positively affect the firm performance. Furthermore, Keskin (2005) also found that the impact of explicit knowledge is greater than tacit knowledge on firm performance.

Singh and Zollo (1998) investigated the impact of tacit and codified knowledge accumulation strategies on the performance of corporate acquisitions. The authors showed that tacit-oriented knowledge management strategy had a positive influence on organizational performance if task characteristics are highly homogeneous or similar. However, Singh and Zollo (1998) also found that codified knowledge management strategy appeared to be an important factor when task characteristics are categorized as low homogeneity. The study indicated that firms should align their knowledge strategies with their task characteristics. Then, Choi and Lee (2002) stated that knowledge management strategies can be divided into two dimensions as declared by many researchers which focus on the system orientation and the human orientation. Furthermore, system orientations focused on codified knowledge through information technology, and try to share that knowledge formally. On the contrary, human orientation in knowledge management strategies, the emphasis focused on dialogue through social networks and person-to-person contact, so the acquisition of knowledge obtained through an experienced and skilled person, and seeks to share knowledge informally (Choi and Lee, 2002). Furthermore, Choi and Lee (2003) based on the study, said that the mix between system orientation and human orientation can produce better corporate performance, Therefore:

H 1: the greater Knowledge management strategy, the greater firm performance

2.4 Environmental Hostility as Moderating Factor

Several researchers have studied the characteristics of the environment plays an important role in the management of the company's sustainability. Furthermore, the organization's external environment is defined as factors that are beyond the direct control of the company (Bapuji and Crossan, 2004, p.407). Atuahene et al (1995) and Keskin (2005) argued that "competition in the market related to the markets in which the company operates. As scholars know that "customers have little or no choice in the weak competitive environment". Nevertheless, in a high competitive market, it is necessary for the company to be responsive to customer needs, to launch superior products and services, to adopt innovative orientation and repair products and processes to prevent customers from switching to other competitors. Moreover, Noordewier, John and Nevin (1990) and Keskin (2005) explained their findings that "turbulence can be identified as unexpected changes in environmental conditions. Obsolete developing products and processes on the market in a short time, the rapid turnover of products and processes, and changes in customer expectations and demands are basic indicators of environmental turbulence". Keskin (2005) also found "that explicit- and tacit-oriented knowledge management strategies positively affect firm performance". Furthermore, both environmental hostility and intensity of market competition also have impact strongly on the relationship between explicit-oriented and tacit-oriented knowledge management strategies and firm performance. Therefore:

H 2: the greater the environmental hostility, the greater the positive relationship between Knowledge management strategy and firm performance.

3. RESEARCH METHODOLOGY

3.1 Research framework.

The present research will develop a model in which the impact of organizational learning capability on firm performance as presented on Figure 1.

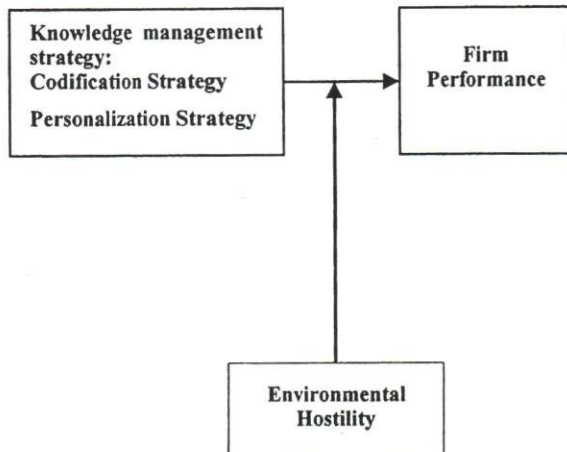


Figure 1. Theoretical Framework

3.2 Population and Sample.

This study used population of all large-sized companies in Indonesia. Furthermore, the target population for the study consisted of a manufacturing organization in ISIC code 26 (non-metallic mineral products), 27 (Primary Metals) 28 (Fabricated metal products, except machinery and equipment), 29 (machinery and equipment), 30 (office, accounting and computing machinery), 31 (electrical machinery and apparatus nec), 32 (Radio, television and communication equipment and equipment), 33 (Medical, precision and optical instruments), 34 (motor vehicles, trailers and semi-trailers) (Hasan, 2008).

3.3 Sampling Design.

Organization is the unit of analysis of this study, according to Campbell, DT (1955) a good informant for the purpose of this research should be one that has access to all the issues under investigation. Therefore, the CEO is the single key informant. Type of sampling design is a limited probability sampling (random sampling technique) where the elements of the population has some probability of being selected as a sample subject. The sample of 1000 respondents drawn from a list of all the respondents in the population using computer generated random numbers (Sekaran, 2003).

3.4 Respondent Response Rate

There were a total of 270 returned questionnaires of which 192 were usable for the purpose of this study. Therefore, the response

rate of 19.79 % can be considered to be reasonable.

3.5 Construct Measurement.

Knowledge Management strategies as independent variable is adopted from Choi and Lee (2003), and Keskin (2005) construct. These dimensions are Codification strategy (Cod), and Personalization strategy (Person). Moreover, firm performance as dependent variable is adopted from Powell & Dent-Micallef (1997), the Tippin and Sohi (2003) construct, Environmental hostility in this study was measured by two factors namely: Environmental Turbulence (ET) and Intensity of Market Competition (MCOM) are adopted from Atuahene-Gima, K (1995), Desphande et al (1993), and Keskin (2005). All constructs above are measured by using five-point Likert scales

4. FINDING AND DISCUSSION

4.1 Goodness of Measures.

In relation with the goodness measure, at least two important methods used in this study, such as validity and reliability. In addition, one way in which the validity of the test can be done is through quasi confirmatory factor analysis by testing each construct using Principal Component Analysis (PCA) separately with varimax rotation technique, and then the reliability tests performed to assess the internal consistency of the items representing each construct using Cronbach's alpha coefficient (Sekaran, 2003).

4.1.1 Principal Component Analysis on Knowledge Management Strategy, Environmental Hostility, and Firm Performance.

A principal component analysis was performed on the 8 items measuring knowledge management strategies that are presented in Table 1. It resulted in four factors with KMO (.85), Bartlett's test of sphericity ($p=.00$) and anti-image above .50. After varimax rotation, all items have high loading only on a single factor with ranging from .74 to .84. Environmental hostility have 9 items resulted two factors with KMO (0, 93), Bartlett's test of sphericity ($p=.00$) and anti-image above .50. After varimax rotation, all items have high loading only on a single factor with ranging from .67 to .83,

moreover, Firm Performance have 4 items resulted in one factors with KMO (.64), Bartlett's test of sphericity ($p=.00$), anti-image and communalities above .50. All items have high loading only on a single factor with ranging from .86 to .88. Therefore, they can be claimed that the result of principal component analysis on three variables above are now very well defined, and they can be utilized in further analysis.

4.1.2 Reliability Analysis.

Table 2. presented the result of the reliability analysis, where all scales are shown at satisfactory levels of reliability with Cronbach's coefficient alpha much higher than the minimum threshold (Cronbach's alpha $>.70$). For example, knowledge management strategies has Cronbach's alpha ranging from .89 to .78, Firm performance has Cronbach's alpha .89, and Environmental hostility has Cronbach's alpha ranging from .92 to .89.

4.2 The Relationship Between Knowledge Management Strategy and Firm Performance.

In order to test the hypothesis that postulated a positive and significant relationship between all dimension of knowledge management strategy and firm performance, the multiple regression analysis has been conducted to determine the variance of firm performance explained by the two dimension of knowledge management strategy (personalization, and codification). The results are summarized in Table 3 below. From the result, it was found out that the two dimension of knowledge management strategy jointly explained 25, 0% of the variance of overall firm performance. Furthermore, the two dimensions of knowledge management strategy [personalization ($\beta = .18$, $p <.05$); codification ($\beta = .39$, $p <.01$) were positively and significantly associated with overall firm performance. Therefore, the main hypothesis and its corollary hypotheses (postulated a positive and significant relationship between all dimension of knowledge management strategy and firm performance) were all supported. In addition, the result also showed that the variance in overall firm performance was very influenced by personalization, and codification.

4.3 Moderating Effect of Environmental Hostility on the relationship Between Knowledge Management Strategy and Firm Performance

Table 4. below shows the result of the three-step hierarchical regression which would be used to test the hypothesis that intensity of market competition and environmental turbulence moderate the relationship between Knowledge management strategy and Firm performance were described in the following section below.

- Moderating effect of intensity of market competition: The findings reveals that R2 change from 26% to 30.6% and F changes 6.65 significantly $p= 0.01$, for the interaction between Codification and MCOM (intensity of market competition) is not significant. While, the interaction between system Personalization and MCOM (intensity of market competition) is significant ($\beta= 3.33$, $p <.01$) in the same direction as hypothesized.
- Moderating effect of environmental turbulence: The findings reveals that R2 change from 25.5% to 31.9% and F changes 8.69 significantly $p= 0.01$. The interaction between codification and ET (environmental turbulence) is significant ($\beta= -2.18$, $p <.01$) but not as hypothesized, and also showing a negative effect. While, the interaction between Personalization and ET (environmental turbulence) is significant ($\beta=3.53$, $p <.01$) in the same direction as hypothesized.

4.4 Discussion

The findings of this study, displayed that knowledge management strategy (intensity of market competition and environmental turbulence) positively affects firm performance. Therefore, this finding fully supports the hypothesis (H 1), and can be concluded that this finding is also in line with a study of Choi and Lee (2003), and Keskin (2005).

Further, to make the final decision in testing the hypothesis (H2) necessary to use the graphical output for the accuracy analysis of the effects moderating variable on the relationship between the relevant dimensions of knowledge management strategy and firm performance.

Table 1. Principal Component Analysis on Knowledge Management Strategies, Environmental Hostility, and Firm Performance

Items	Component	
	1	2
Personalization		
▪ Person1	.84	.19
▪ Person 2	.83	.21
▪ Person 3	.83	.22
▪ Person 4	.81	.28
Codification		
▪ Cod1.	.15	.78
▪ Cod2	.22	.76
▪ Cod3	.24	.75
▪ Cod4	.21	.75
KMO (.85)		
Bartlett's test of sphericity (.000)		
Percentage Variance Explained	36.60	31.33
Eigenvalue.	4.09	1.34
Environmental Hostility		
Intensity of Market Competition (MCOM)		
MCOM1	.78	
MCOM2	.82	
MCOM3	.80	
MCOM4	.77	
Environmental Turbulence(ET)		
ET1		.67
ET2		.75
ET3		.81
ET4		.83
ET5		.80
KMO (.93)		
Bartlett's test of sphericity (.000)		
Percentage Variance Explained	39.35	36.99
Eigenvalue.	6.09	0.77
Firm Performance		
▪ Profitability		.86
▪ Return on investment		.88
▪ Sales Growth		.88
▪ Customer Retention.		.88
KMO (.64)		
Bartlett's test of sphericity (.000)		
Percentage Variance Explained		76.50
Eigenvalues		3.06

From Figure 2. It can be seen that the impact of personalization strategy on firm performance is always positive for all level of intensity of market competition and environmental turbulence. However, under conditions of high environmental hostility (intensity of market competition and environmental turbulence), the influence of personalization strategy on firm

performance is greater when the extent of personalization strategy varies from low to high. Therefore, we could now conclusively state that the higher intensity of market competition and environmental turbulence, the higher the relationship between personalization strategy and firm performance.

Table 2. Reliability Analysis on Variables of the Study.

Construct	Variables	Number of items	Cronbach's alpha
Knowledge Management strategies.	Personalization	4	.89
	Codification	4	.78
Environmental hostility	MCOM	4	.89
	ET	5	.92
Firm Performance	Overall Performance	4	.89

Table 3. Multiple Regressions: Knowledge Management Strategy and Firm Performance

Dependent Variable	Independent Variable	Beta (β)
Overall Firm Performance	▪ Personalization	.18 **
	▪ Codification	.39***
R ²	.25	
Adjusted R ²	.24	
Sig F	.000	

Note. Significant levels *** p<.01; ** p <.05; * p <.10

Table 4. Moderating Effect of Environmental Hostility on the Relationship Between Knowledge Management Strategy and Firm Performance.

Dependent variable	Independent variable	Standard Beta Step 1	Standard Beta Step 2	Standard Beta Step 3
Firm Performance	Codification	.39**	.39**	.89
	Personalization	.18*	.106	-1.45**
	Moderating MCOM		.087	-1.125*
	Interaction CODxMCOM			-1.029
	Interaction Persn XMCOM			3.33**
	R ²	.254	.26	.306
	R ² change	.254	.002	.050
	Fchange	32.212	.581	6.65
	Sig. F change	0.000	.447	.002
Firm Performance	Codification	.391**	.394**	1.56**
	Personalization	.177*	.049	-1.678**
	Moderating ET		0.131	-.302
	Interaction CODxET			-2.18**
	Interaction PersonxET			3.53**
	R ²	.254	.255	.319
	R ² change	.254	.001	.064
	Fchange	32.212	.275	8.69
	Sig. F change	.000	.600	.000

**p<.01; *p<.05

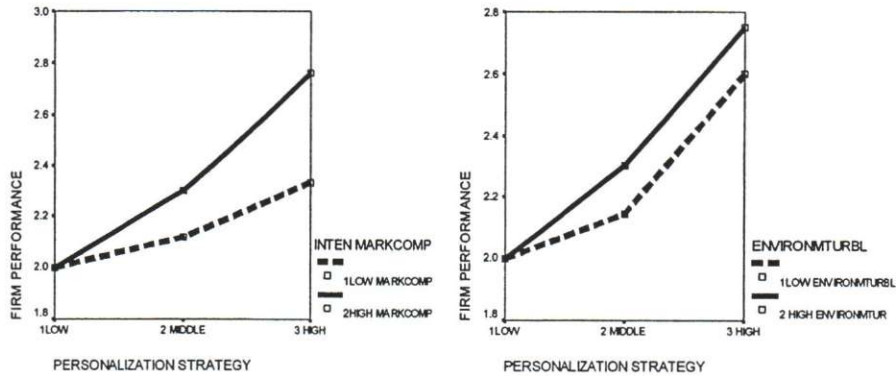


Figure 2. The Impact of Intensity of Market Competition and Environmental Turbulence On the Relationship Between Knowledge Management Strategy and Firm Performance

The findings of this study indicate that the moderating effects of environmental hostility (intensity of market competition and environmental turbulence) influence only the relationship personalization strategy and firm performance on a large scale manufacturing in Indonesia. Otherwise, has no moderating effect on the relationship between codification strategy and firm performance. Therefore, this finding shows that the hypothesis (H2) is only partially supported, and is not in line with a study of Keskin (2005). Where, Kiskin (2005) found that the greater the environmental hostility, the greater the relationship between knowledge management strategies (personalization and codification knowledge strategy) and firm performance. In large-scale manufacturing firms, especially in Indonesia in the face of high environmental hostility (intensity of market competition and environmental turbulence), to maintain their business sustainability, they seem more focused on application personalization strategy. This finding may be in line with what was said by Nonaka and Takeuchi (1995), Spender and Grant (1996) that the firms focused on personalization strategy (tacit knowledge), which is "hard to imitate", "creates competitive advantage", "plays a key part in innovations process and leads to individual creativeness", "can develop core processes", "combine their ability and experience rapidly answer the new idea", "so that they can take great advantage especially in dynamic environment".

5. CONCLUSION

The objective of this study was to investigate the relationship between knowledge management strategy (intensity of market competition and environmental turbulence) and Indonesian manufacturing firm performance. The finding shows that knowledge management strategy positively affects Indonesian manufacturing firm performance. In addition, other findings display that only environmental hostility has the moderating effect on the relationship between personalization knowledge strategy and Indonesian manufacturing firm performance. This means that the hypothesis H2 is only partially supported, or in other words Indonesian manufacturing firm tend to use personalization knowledge strategy in facing the high intensity of market competition and environmental

turbulence, in order to maintain the sustainability of their business.

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