

THE EFFECT OF INFORMATION SHARING AND QUALITY OF INFORMATION ON THE PERFORMANCE OF SUPPLY CHAIN: THE CASE OF EAST JAVA MANUFACTURING SMEs

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RESEARCH ARTICLE

THE EFFECT OF INFORMATION SHARING AND QUALITY OF INFORMATION ON THE PERFORMANCE OF SUPPLY CHAIN: THE CASE OF EAST JAVA MANUFACTURING SMEs.

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Abstract

Currently the Indonesian companies face much more challenges in increasingly critical consumers in needs and desires. Therefore, companies need to create superior customer value and competitive advantage by providing products at the right time and place. Therefore, the companies have to develop a network of cooperation with partner companies in the provision of goods and services for consumers efficiently by managing of supply chain management. Information sharing plays an important role in the implementation of supply chain management due to the availability of data in a timely manner and can be distributed along the supply chain can help companies to respond the changing needs and desires of consumers faster. Whereas the information quality what, when, how, and with whom the information is shared. The study found that there are impacts of antecedent factors (environmental uncertainty, intra-organizational factors, and factors of inter-organizational) on information sharing and information quality in supply chain management.

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Introduction:

Currently, companies in Indonesia are faced with the challenge of increasingly critical consumers in meeting the needs and demand. Service should be an integrated part of the business to achieve superior customer value and create competitive advantage. To achieve these objectives, having a product which is available at the right time and place will enable the company to compete in a volatile market. In fact, the resources and competencies required are often hard to come by companies individually. Therefore, it is important for companies to cooperate and to develop core resources through partnerships with business partners from upstream (suppliers) to downstream (distributors), which is known as supply chain management.

Supply Chain Management (SCM) is the integration of the activities of procurement of materials and services, conversion into semi-finished goods and finished product, as well as delivery to the customer. The goal is to build a chain of suppliers that focus on maximizing value for customers (Chopra, 2001). The key for effective supply chain management is to make the suppliers as "partners" in the company's strategy to meet the changing market (Heizer and Render, 2006).

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Network system coordinated and integrated cooperation in supply chain management can be done either through the integration of internal or external integration². Internal integration related to the integration of the value chain where many companies involved, collaborate to plan, implement, and manage the movement of goods and services, and information that can improve the customer- perceived value (Morash and Clinton, 1998)

To create inter-firm coordination and integration, information sharing becomes absolutely necessary to achieve success through effective coordination of cooperation in the supply chain and be in control throughout the supply chain system. Coyle (1996) revealed the results of empirical studies in supply chain management literature provides evidence that the information sharing is very important to reduce uncertainty, to improve product development, and to improve the scheduling request and expense. Through information sharing, companies can obtain information about what the customer wants, improve operation process and minimize the gap in the supply chain.

The benefits obtained by the company in the distribution of information depends on what, when, how, and with whom the information is shared. What information should be shared is very important to have a positive impact on the supply chain performance. An understanding of the factors that influence the distribution and quality of the information is necessary to facilitate the information sharing and to provide high quality information. Some of the factors that affect the information sharing and information quality include environmental factors, intra-organizational factors, and inter-organizational relationships (Li and Lin, 2006).

Therefore, the purpose of the study was to identify the factors that influence information sharing and information quality in the supply chain performance.

Literature Review:-

From the above description, the research model to be tested can be shown in Figure 1. The model shows the relationship between antecedent factors (environmental uncertainties, intra-organizational factors, and inter-organizational factors) that have an impact on information sharing and information quality in the supply chain management.

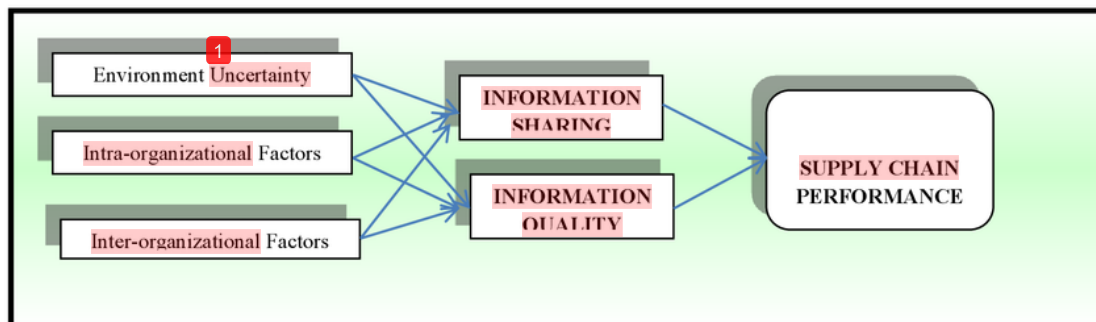


Figure 1:- Research Framework
Source: Modified From Li dan Lin (2006)

Information sharing is defined as the rate of interest and the accuracy of the information communicated to business partners in the supply chain, which are crucial to achieve the effectiveness of the supply chain, but the impact will be felt is significantly depends on what, when, how, and with whom the information is shared. The information quality covers aspects accuracy, timeliness, adequacy of information, and the credibility of the information exchange (Monezka et al., 1998). Information sharing plays an important role in the implementation of supply chain management because of the availability of data in a timely manner and distributed along the supply chain can help companies to improve the efficiency and effectiveness of the supply chain, as to respond the changing needs and consumer desires faster. (Lin et al., 2002).

Environmental Uncertainty:-

In this study, the environmental conditions measured through variable environmental uncertainty that is one of the external factors which important in determining and controlling the sharing of information throughout the supply chain management. Krause et al. (1998) suggested that in order to respond to such uncertainties, companies need to

cooperate with customers and suppliers through a supply chain. Environmental uncertainty is an important external factor in the process of information sharing, which can be classified into four factors: the increase in global competition, the development of sustainable technologies, changes in consumer demand, the increase in the needs, and involvement of organization's external environment such as suppliers and customers (Grover, 1993; Chandra and Kumar, 2000; Lambe and Speakman, 1997; Mentzer et al., 2000). This study adopts environmental uncertainties proposed by Etlie and Reza (1992) which includes consumer uncertainty, suppliers uncertainty, and technological uncertainty. Previous research supports the importance of environmental uncertainty consideration as critical success factors of information sharing and information quality in supply chain management (Alvarez, 1994; Chandra and Kumar, 2000; Lambe and Speakman, 1997; Mentzer et al., 2000)

Intra-organizational Factors:

Intra-organizational factors refer to the support of top management and IT (Information Technology) enabler in the implementation of integration strategies in supply chain management into the overall organizational strategy (Wu et al., 2004). Top management support is defined as the level of understanding of managers to ensure high quality information sharing between business partners along the supply chain. As a facilitator of intra-organizational, top management must understand the advantages and the creations of organizational culture that is conducive to support information sharing and improve information quality (Lee and Kim, 2004). IT enabler is defined as the use of information technology to facilitate information sharing and information quality throughout the supply chain. In This study used five IT enablers, consists of: Electronic Data Interchange (EDI), Electronic Funds Transfer (EFT), Internet, Intranet, and Extranet which identified as factors that affect information sharing and information quality. Without the support of information technology, the quality of information sharing is impossible to achieve in supply chain management.

Inter-Organizational Relationships:-

Interorganizational factors include three sub-dimensions which include: trust in business partners, commitment to business partners, and a shared-vision among business partners in the supply chain (Li and Lin, 2006; Anatan, 2008). Confidence in the business partner is defined as a willingness to rely on a trusted business partner and is believed to be the most productive factor in fostering long-term relationships (Speakman et al., 1998). Commitment to business partners indicate a desire to maintain a valued relationship and beneficial to each party involved in the collaboration, this commitment includes the right to entrust information to suppliers (Wilson and Volsky, 1998). Shared-vision with business partners is defined as the degree of similarity pattern of values and trust between firms in the supply chain (Lee and Kim, 1999). Ballou et al. (2000) defines a shared-vision as the degree of similarity of beliefs about the behavior, attitudes, goals, and policies in general are considered to be important or not important, proper or improper, and right or wrong.

Based on the theoretical explanation and the result of research studies that have been done can be developed hypothesis as follows:

- H1a: the environmental uncertainty has a significant impact on information sharing
- H1b: intra-organizational facilities have a significant impact on information sharing
- H1c: inter-organizational relationships have a significant impact on information sharing
- H2a: the environmental uncertainty has a significant impact on information quality
- H2b: intra-organizational facilities have a significant impact on information quality
- H2c: inter-organizational relationships have a significant impact on information quality

Information Sharing, Information Quality and Performance of Supply Chain Management:-

In the implementation of supply chain management, information sharing plays an important role to ensure the organization in achieving a competitive advantage in the long run. The importance information sharing role as one of the important factors in the implementation of supply chain management has been demonstrated in several studies in the development of empirical literature on supply chain management (Lalonde, 1998; Stein and Sweat, 1998; Yu, 2001; Childhouse and Towill, 2003). Information sharing is strongly influenced by information quality such as, accuracy, timeliness, adequacy of information, and the credibility of the exchange of information. Significant impact on the process of information sharing on supply chain performance is highly dependent on the quality of the information, when, how, and to whom the information is shared (Chizzo, 1998; Jarrel, 1998).

Performance measurement system, which is often used in empirical studies in the field of supply chain management is a model SCOR (Supply Chain Operations Reference). It integrates three main elements in the management of that

Business Process Reengineering (BPR), benchmarking and process measurement. Processes in the supply chain SCOR model is divided into five core processes that plan, source, make, deliver, and return. In this study, the measurement of the dimensions of supply chain performance seen from a variety of common dimensions, namely reliability, responsiveness, flexibility, cost, and assets (Pujawan 2005 in Anatan and Ellitan, 2008). Based on these descriptions can be formulated hypothesis as follows:

H3a: Information sharing has a significant impact on supply chain performance

H3b: Information quality has a significant impact on supply chain performance

Research Methods:-

The population of this study includes all manufacturing companies operating in East Java. The sample was determined by using purposive sampling and sample selected is a manufacturing company with the criteria of having small and medium scale with a sample of 500 companies. Data collection through mailed questionnaires. The target respondents are leaders or owners of companies who have access to information related to the questionnaire.

Questionnaire to measure the environmental uncertainty factors adopted from Etlie and Reza (1992), consists of 9 items; the next 9 items to measure intra-organizational factors (Wu et al, 2004); and 10 items to measure the inter-organizational relationships in the supply chain (Li and Lin, 2006). Furthermore, 3 items to measure variable information sharing and 5 items for the variable information quality. Finally, 13 items used to measure the performance of the supply chain. Measurement of each variable using a five point Likert scale (1 = strongly disagree/very low, 5 = strongly agree/very high). Data analysis techniques to test the research instruments, which includes the validity and reliability, and multiple linear regression analysis.

Data Analysis and Findings:-

Of the 500 questionnaires sent, only 47 questionnaires that can be processed, so that the rate of return the questionnaire in this study was 9.4 %. Profiles of 47 companies that have participated in this study distinguished by age and type of business enterprise. Based on age, 11 companies were aged between 5-10 years, 22 companies between 10-20 years old, 6 companies between 20-30 years old, and 8 company more than 30 years old. Based on the business field, it was found that the craft industry and furniture are 18 companies ; 14 companies in the field of chemical; 7 companies in the field of textiles and clothing; 5 companies in the field of metal goods and 3 companies in the field of nonmetallic goods.

Validity testing is done by using factor analysis with varimax rotation show that the value of factor loadings for each variables are all more than 0.55. Reliability testing results for each variable shows Chronbach 's Alpha value higher than 0.5, so that the analysis can be continued.

Table 1:- The Impact of Antecedents Factors Influence on Information Sharing and Information Quality

Dependent	Independent	B	SE	t test		F test		R ²
				t	sign	F	sign	
IS	Intercept	3.618	.174	20.778	.000	431.717	.000	.050
	Inter	.014	.057	.244	.807			
	Intra	.223	.056	3.971	.000			
	EU	-.084	.059	-1.419	.156			
IQ	Intercept	2.353	.169	13.964	.000	194.984	.000	.239
	Inter	.619	.055	11.290	.000			
	Intra	-.185	.054	-3.409	.001			
	EU	-.022	.057	-.381	.703			

Source : Data Processed

Various research findings can be summarized as follows: **First**, a regression model shows that the overall of antecedent factors (environmental factors, facilitators intra-organizational, and interorganizational factors) jointly influence on information sharing. **Second**, regression model shows that the antecedent factors (environmental factors, facilitators intra-organizational, and inter-organizational factors) jointly affect the information quality.

Third, environmental factors do not have a significant impact on information sharing and information quality which can be seen on each of the partial significance values in Table 1. This is because the subjects involved in this study

are companies with small scale and medium, so that attention to the environment and competition in the industry is still lacking. Theoretically, this is in accordance with the result proposed by Badri et al. (2000) that the scanning environment only by large-scale enterprises. This makes the reasons why the dimensions of environmental uncertainty as an antecedent factor has no significant impact on information sharing and information quality on small and medium scale enterprises.

Fourth, the results of hypothesis testing showed that intra-organizational factors have a significant impact on information sharing and information quality, while the inter-organizational relationships do not provide significant effect either on information sharing. This is because companies with small and medium scale enterprises more on internal factors of the organization compared to inter-organizational emphasis on the development of long-term collaborative relationship based on coordination and requires commitment and trust that involves many parties. Companies with small and medium-scale reliance on competition among companies than competition between networks.

Table 2:- The Effect of Information Sharing and Information Quality on Supply Chain Performance

Dependent	Independent	B	SE	t test		F test		R ²
				t	sign	F	Sign	
SCP	Intercept	3.148	.188	16.747	.000	1.928	.146	0.08
	IS	-.029	.039	-.751	.453			
	IQ	.069	.036	1.937	.053			

Source: Data Processed

The results of the model **5**ing presented in Table 2. Multiple regression analysis method with information sharing and information quality as the independent variable and the performance of the supply chain as the dependent variable, shows the value of the F test worth 1.928 with a significance level of 0.146 which has a meaning that jointly models are not explain the effect of information sharing and information quality on the the supply chain performance. But for the model should be interpreted with caution because if seen partially interpret the information quality has a significant impact on supply chain performance with t sig = 0.53 at the 10% confidence level. Value can be interpreted significant F test **8** with 15% confidence level because there is a significant partial variable. Information partial sharing does not have a significant effect on the performance of the supply chain, this can be explained as well as the previous explanation that due to companies with small and medium scale enterprises rely more on internal factors of the organization compared to the inter-organizational relationships, so that inter-organizational relationships are often not able to well managed.

Partnership (Supply Chain) in SMEs:-

SMEs are required to carry out the restructuring and reorganization with the aim to respond the increasing consumer demanding product with high-quality and low prices. One of the efforts of SMEs is through collaboration relationships with Large Business (LB). Awareness of cooperation (partnership) has given birth to the concept of supply chain management.

The partnership should be accompanied by development of the SME that attention to the principle of mutual need, mutually reinforcing and mutually beneficial. Partnership is a business strategy that is performed by two or more parties in a certain period of time to achieve profit together with the principle of mutual benefit and mutual raising. Thus, the growth of SMEs in Indonesia can not be separated from its function as a partner of LB are engaged in a business partnership.

Conclusions and Limitations:-

The regression model indicates that the antecedent factors (environmental factors, intra-organizational factors, and inter-organizational factors) jointly influence on information sharing and on the information quality. Environmental factors have a significant impact **12** information sharing and information quality. The results of hypothesis testing showed that intra-organizational factors have a significant impact on information sharing and information quality, while the inter-organizational relationships do not have a significant effect on information sharing. Regression Models with variable information sharing and information quality as the independent variable and the performance

of the supply chain as the dependent variable showed that jointly models are not significantly effect of information sharing and information quality on the the supply chain performance.

This study still has some limitations, among others: (1). The study sample includes some industries (multiple industry). Industrial composition in the sample may indicate the presence of performance variability between industries so that the effect of the industry needs to be controlled. However, in this study on the effects of industrial control has not been performed (2). This study used through mail surveys. Although the validity and reliability has been tested, the response may be contained in the respondent's lack of answering the research questions that can lead to bias and make the results of the analysis is not good.

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