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An Empirical Internal Perceptions Study of the Implementation Supply Chain Management in Indonesian Manufacturing Companies As a Mediating Factor of Information Technology Utilization to Organization Performances

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ABSTRACT:
Purpose - This study aims to analyze and explain the SCM practices as mediation of information technology on organizational performance in large-scale manufacturing enterprises. In addition, analyze and explain the direct influence of information technology on organizational performance.
Methodology - There are 140 large-scale manufacturing companies in East Java - Indonesia as the study sample. The method used was a survey. Manager SCM / logistics manager in the company as research respondents. Analysis using multivariate statistical methods SEM (Structural Equation Modeling).
Research Findings - Results showed that SCM practices are fully capable of mediating information technology to improve organizational performance. SCM is able to practice as a determinant of the success of the use of information technology to improve organizational performance.
Originality - (1) information technology can help the leadership to run the SCM practices in improving organizational performance. (2) the company's ability to creating proximity to customers (Customer relationship) and the closeness of the relationship with the supplier (supplier Close partnership), companies doing long-term contracts with suppliers and customers is key to success of information technology in order to improve organizational performance.
Keywords: Information Technology, SCM Practice, Performance Organization

I. INTRODUCTION

Backwardness of information and communication technology in Indonesia, as well as the challenges of competition in the strict business environment, manufacturing competitiveness ranking Indonesian low, logistics capabilities in Indonesia is still not satisfactory and the demands of the role of the manufacturing sector to be more competitive to improve performance, becomes the reason for researchers to investigate the role of technology information as an effort to improve organizational performance in Indonesian manufacturing company, specialized in East Java.

Information technology can not only improve the efficiency and effectiveness of operations, but it is one way to change the business competition (McFarlan, 1984). Furthermore, based on the resource-based view, technology is a vital resource for a company to gain a competitive advantage. Companies should develop a resource strategy as a leader who can continue to create a life superior performance (Grant, 1991).

Research Weil, (1992); Barua et al., (1995); Rai et al., (1997), Markus and Soh, (1993); Loveman, (1994), Hitt and Brynjolfsson, (1996) shows that the empirical results no association of information technology on business performance. Similarly, previous studies found that there is no clear effect on the ability of information technology throughout the performance. This means that there has not been enough research on the investigation of mediating mechanisms linking information technology and performance. The direct effect of specific information technology skills, such as analytical systems with inter-company collaboration is less studied (Rai et al., 2006). Similarly, the effective use of technology as a medium for coordination or integration between the internal organization and the organization has received a lot of attention, but it still causes a lot of conclusions are less clear (Narasimhan and Kim, 2002).

Different views are revealed from the results of research conducted Sohal and Lionel, (1993) which examines the influence of the role of information technology in 530 companies in Australia and found the use of information technology is positively related to organizational performance. The case with research Bender, (1986); Barua and Lee, (1997) also states that there is a relationship of information technology on business performance. Motivated from differences in the findings of the above study, the study aims to examine and explain the use / usage of information technology on organizational performance.

In the SCM literature Chin et al., (2004) and Kuei et al., (2001) by Jayaram et al., (2000) gives a comprehensive overview concludes that the isue of timeliness is a major concern in the research of SCM. SCM aims to respond to customers as quickly as possible, at the exact time and location with the lowest possible cost. Furthermore, some researchers SCM (Chase et al., 2007; Simchi-Levi et al., 2008; Lummus and Vokurka, 1999;

Lummus et al., 2003) have agreed that SCM emphasizes the flow of materials and information through the supply chain.

Several studies have shown a positive relationship between supply chain collaboration and performance (eg, Rodrigues et al., 2004; Sanders and Premus, 2005; Stank et al., 2001) and as well as in case study Bayraktar et al., (2009) also reported a positive relationship between the use of information systems and technology on SCM practices and firm performance using a sample of the metal fabrication industry in Turkey. Besides, there are many studies on the use of information technology systems to support SCM, the results clearly show that the use of new technologies to improve the efficiency of the supply chain and improve overall company performance (Lindskog and Wennberg, 2002). Motivated from the above statement and research findings, the study aims to examine and explain the SCM practices in using information technology to improve organizational performance.

II. LITERATURE REVIEW

INFORMATION TECHNOLOGY

Information technology provides opportunities for improvement and as a source of competitiveness supporting its use continues to increase. In fact, the key to controlling the use of information technology which includes inter-activity in the supply chain, financial opportunity, efficiency, cost savings, increased customer and market penetration, and increased competition (Sood et al., 1999). Chiu (1995) states that information technology is an important prerequisite in the integration of logistics management. Integration of information technology and information systems toward higher product quality, increase productivity and ultimately improve logistics efficiency and flexibility (Narasimhan and Kim, 2001). Cachon and Fisher (2000) reported the possible use of technology to share information timely supply and demand, particularly in the food industry, which substantially reduce the time and cost to process an order, ensuring impressive improvements in the overall supply chain performance. A study recently conducted by the managers of manufacturing companies in the U.S. indicate increasing dependence on deliveries by exploiting information technology supply chain, including: improved supply chain agility, reduce cycle time, improve operating efficiency, and timely delivery of the product up to end customers (Radjou, 2003). Wu et al., (2006), the findings suggest the ability of supply chain management enables information technology represent a source of sustainable advantage. Once the importance of information technology in ensuring the sustainability of the company's business processes, able to motivate companies to adopt information technology. Some researchers suggest that improving the exchange of information can have a huge effect on the overall company performance and efficiency (Bowersox and Closs, 1996; Close and Savitskie, 2003; Daugherty et al., 1995; Gustin et al., 1994). Research study defines the role of information technology in the company's ability to provide the data and process it into information that includes the completeness and accuracy of hardware, software, database and network in order to produce information (market, resource companies) are useful for the next user.

SUPPLY CHAIN MANAGEMENT

SCM is understood as a management philosophy (Tan et al., 2002, Chan and Qi, 2003). For example, Lummus and Vokurka (1999, p. 11) were reviewed Ellram and Cooper (1993) definition, which is "SCM is a management philosophy that governs the total expenditure of the distribution channel from the supplier to the ultimate customer." SCM is described in many terms; integration of suppliers; partnerships; major supply management, supplier alliances, balance supply chain (Tan et al., 2002); lane network; supplier of pipeline management; management value chain, and value stream management (Croom et al ., 2000; Romano and Vinelli, 2001), and as a demand chain (Kotzab and Otto, 2004 in Vahrenkamp, 1999; Blackwell and Blackwell, 1999).

Supply chain management is a philosophy of an integrated approach to manage the total flow of a distribution channel from the supplier to the ultimate customer. (Ellram and Cooper, 1990). The management of upstream and downstream connecting inside and outside the company's operations with suppliers and customers to deliver value to key customers with a low cost supply chain as a whole (Martin, 1998; Weber, 2002). Effective supply chain strategy can create competitive advantage, such as the right to include business partners, precision delivery of goods and services and competitive quality at a reasonable cost (Hewitt, 1994; Hobbs et al., 1998; Easton, 2002).

Supply chain management is a relatively new concept in the business world with the aim of achieving efficiency in all operational functions in the provision of supplies from external environmental uncertainty. In some of the literature of supply chain management involves coordinating various disciplines with simplification atiran early material and supplier information to the end user. SCM including management information systems, purchasing, customer service, sourcing, transportation, production schedules, ordering process, inventory management, warehousing and marketing. SCM is a strategic management tool used to improve the entire customer satisfaction desirable to improve the company's competitiveness and ability to generate profits (Lummus et al., 2001). "Time" is an important resource element in the modern business environment in terms of customer satisfaction (Chan et al., 2003). Therefore, in order to understand the supply chain operations, it is

necessary to measure the activity of attention earlier this time, which had begun in performance measurement related to suppliers, delivery performance, customer service, inventory, logistics costs, and satisfaction customers within a supply chain (Gunasekaran et al., 2001). Consider the description above, the Supply chain management (SCM) is the company's ability to establish and maintain long-term relationships with suppliers and customers in an effort to improve the entire customer satisfaction include the company's ability to establish proximity to customers (Customer relationship), and the company's ability to establish close relationship with suppliers (Close supplier partnership).

PERFORMANCE ORGANIZATION

Organizational performance is an indicator that measures how well the organization in achieving its goals (Ho, 2008). Li et al., (2006) defines organizational performance in terms of how well a market-oriented organization and achieve their financial goals. In regard to financial objectives, organization's profits, return on investments, and the growth of sales, business performance and organization effectiveness are indicators of organizational performance (Venkatraman and Ramanujam, 1986). Koh et al., (2007) and Petrovic-Lazarevic et al., (2007) view organizational performance from the perspective of SCM. Koh et al., (2007) stated that although organizational measure of financial performance and market criteria, short-term goal of SCM is to improve productivity and reduce inventory and lead time. The long term goal of SCM is to increase the market share and the integration of the supply chain (Koh et al., 2007). While Petrovic-Lazarevic et al., (2007) to measure organizational performance against indicators such as Lead Time, Inventory turnover, product rejection / return, sales levels, cost reduction and meeting customers' requirements. Based on the theoretical basis, the performance of the organizations in this study is an assessment evaluation measure performance through consideration of the implications on the performance capabilities of SCM practices in an effort to meet customer expectations in the assessment of the company's ability to suppress or reduce defective products and returned (product rejection / return); suppress or reduce costs (cost reduction), and meet the needs of customers (meeting customers' requirement).

III. FORMULATION OF HYPOTHESES

Sohal and Lionel (1993) examined the influence of information technology on the role of companies in Australia and found the use of information technology is positively related to organizational performance. The case with research Bender (1986); Barua and Lee (1997) also states that there is a relationship overall information technology on business performance. Previous research has found that the influence of information technology capabilities to the entire performance, which still remains unclear. This means there is not enough research on the investigation of mediating mechanisms linking information technology and performance. The direct effect of specific information technology skills, such as analytical systems with inter-company collaboration is less studied (Rai et al., 2006). Similarly, the effective use of technology as a medium for inter-organizational coordination or integration has received much attention, but it still causes a lot of conclusions are less clear (Narasimhan and Kim, 2002). A number of researchers have also stated that fixing the exchange of information can have a huge effect on the overall efficiency and performance of the firm (Bowersox and Closs, 1996; Close and Savitskie, 2003; Daugherty et al., 1995; Gustin et al., 1994). The existence of a theoretical basis that there is a direct influence of information technology on organizational performance, then the formulation of the first research hypothesis is:

HI. Information technology will be able to contribute directly improve organizational performance.

Several studies have shown a positive relationship between supply chain collaboration and performance (eg, Rodrigues et al., 2004; Sanders and Premus, 2005; Stank et al., 2001), and as well as in case study Bayraktar et al., (2009) also reported a positive relationship between the use of information systems and technology on SCM practices and firm performance using a sample of the metal fabrication industry in Turkey. Besides, there are many studies on the use of information technology systems to support SCM, the results clearly show that the use of new technologies to improve the efficiency of the supply chain and improve overall company performance (Lindskog and Wennberg, 2002).

The existence of a theoretical basis that there is a direct influence of information technology on organizational performance, and SCM practices affect organizational performance, and information technology influence the practice of SCM, the formulation of the second research hypothesis is:

H2. SCM practices will be able to mediate the role of information technology in improving the performance of organizations.

IV. METHODOLOGY

RESEARCH DESIGN

The research approach is quantitative (positivist) will be used to answer the research question. Survey method used in this study. The data were collected through questionnaire. Using a Likert scale of 1-5 as an approach to facilitate the measurement of perception. Relationships latent variables and indicators are reflective.

Exogenous variables reflected the information technology with four indicators, namely hardware (hardware), software (software), database (the database) and Network (network). SCM practices reflected endogenous variables two indicators, namely proximity to customers (Customer relationship), close relationship with suppliers (Close supplier partnership) and organizational performance variables is reflected in three indicators suppress or reduce the products are defective and returned (product rejection / return); suppress or reduce costs (cost reduction), and meet the needs of customers (meeting customers' requirement). Analysis using multivariate statistical method (Structural Equation Modeling).

POPULATION

Large-scale manufacturing company that uses information technology, running the SCM practices in East Java, Indonesia. There are 185 large-scale manufacturing companies listed on the list of company names at the Department of Trade and Industry in East Java.

SAMPLING

The sampling method used in this study is probability sampling. Sampling technique in this study using simple random sampling technique by way of a lottery to take a number of samples required with consideration of each unit of analysis has the same opportunity as others to be selected into the sample. Determination of the proposed sampling technique used by Hair, Black, Babin, Anderson, and Tatham (2006), which states that in order to perform multivariate research is needed with a power of 0.8 alpha is assumed to be 5%, then what is needed in this study is minimal as many as 130 samples (Hair et al., 2006). Sample size of 140, there are 8 pieces of research questionnaires were not included in the analysis because of incomplete filling so that the number of questionnaires that can be analyzed as many as 132 samples.

V. RESULT AND DISCUSSION

Instruments testing

In this study, tests were conducted on 30 respondents instrument that shows all items of the statement of the three studied variables declared invalid evidenced from the correlation coefficient of each item statement is greater than 0.3. Furthermore, it demonstrates the level of reliability is well proven from Chronbach's Alpha coefficient values greater than 0.6. Thus, the instrument can be distributed throughout the target sample set in this study.

The structural equation model testing

In this study also tested the structural equation model (SEM) is required as the assumptions of normality, outliers and multicollinearity. Result output data normality assisted with AMOS program above shows that almost all indicators showed a normal distribution proved critical ratio of skewness values are at ± 2.58 unless indicators X12 and X13. X12 indicator values obtained critical ratio is still below the skewness of - 3.609 - 2.58 and X13 indicators obtained critical ratio value of skewness - is still below the 2.977 - 2.58. In addition, review the results of multivariate value of 18.104 indicates still not able to meet the assumptions of normality, the numbers proved far between absolute value of ± 2.58. Referring to the opinion Bentler and Chou (1987) in Wijayanto (2008) says that when the sample size exceeds the number at least 5 times the number of observed variables in structural equation models or 100-200 cases, it can be found to comply with the normal distribution. Number of samples studied were 140 more than 5 times the number of observed variables which is equal to 45 (5X9), and do not exceed the limit of 100 to 200 cases. Thus, based on the opinion Bollen (1989), Bentler and Chou (1987), the indicators tested normal distribution.

Output results Mahalanobis Distance AMOS program assisted the Mahalanobis Distance indicate the lowest value of 3.820 and a high of USD 43.756. Output value of the test on the model equations researchers produce structures built Chi-squares value table (df = 24, p = 0.001) of 36.41. The test results showed that none of the cases had Mahalanobis Distance value above 36.41. The test results showed no observed data are multivariate outliers.

Univariate outlier output results using a large sample of the 140 respondents, the univariate outlier otherwise occur if the value of Z-score ≥ 4.0. Univariate outlier or not happen if the Z-score <4.0. Descriptive analysis for each indicator standardized research in the form of Z-score has a mean value of zero with a standard deviation of one indicates that the minimum value of Z-score of - 3.976 (Z-score: CF) and the maximum Z-score amounted to 1.802 (Z-score: SM). The test results showed that the value of Z-score does not exceed the minimum and maximum number of 4.0. From these test results it was concluded that the data used are free of univariate outliers.

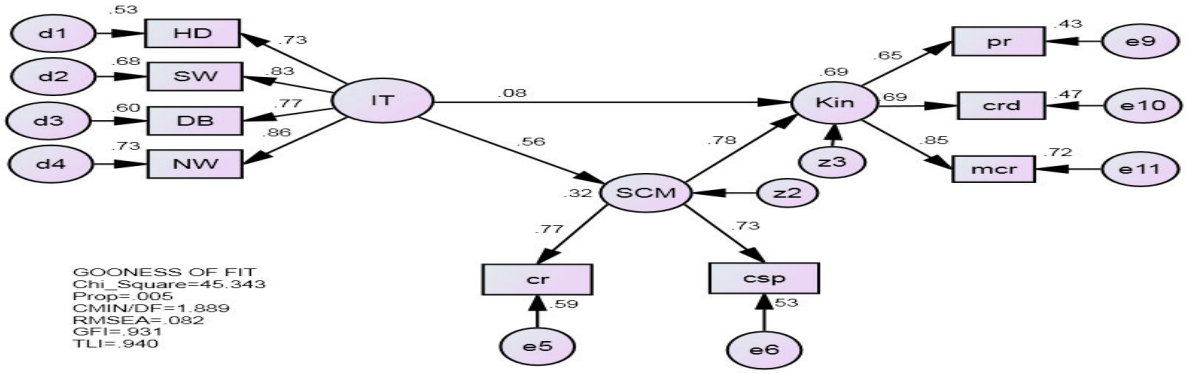
Multicollinearity output results of the correlation matrix of the measured variables that showed none of the correlation values above 0.9. The evaluation results indicate that there is no multicolinearity problem.

Figure 1 shows a summary of the results of SEM analysis using AMOS program. Value of each variable latent factor loading indicates none below 0.5 with a significance level of less than 0.05, meaning that each latent variable is capable of forming high unidimensionalitas and met the convergent validity. Structural

equation model can be used as an analysis tool indicated by the Chi-square value divided by the value of 45.343 degress of freedom (24) of 1.889.

The results of the research value of loading factor indicator (Figure 1) shows the software (software) and network (network), proximity to customers (Customer relationship) and the closeness of the relationship with the supplier (supplier Close partnership), and satisfy customer needs (meeting customers' requirement) able to operationalize the latent variables of information technology, SCM practices and organizational performance.

Figure 1 Model Output Measurement with AMOS approach



Testing a causal relationship between the study variables are shown in Table 1. Statistical results of the direct influence of information technology on organizational performance in structural equation models showed no significant effect. SCM practices are able to mediate the full role of information technology on organizational performance.

Table 1. The causal relationships of the research variables

Variables			*Koef. Standardized*'s influence:			Prob	Info	Hypothesis
Independent	Mediation	Dependent	Direct	Indirect	Total			
IT	-	Organizational performance	0.079	-	0.079	0.509	TS	H1- rejected
IT	SCM practices	-	0.564	-	0.564*	0.000	S	-
-	SCM practices	Organizational performance	0.781	-	0.781*	0.000	S	-
IT	SCM practices	Organizational performance	-	**0.564 X 0.781 = 0.440**	-	-	S	H2- accepted
Information: S = significant ; TS = not significant								

***Note**: All coefficients are significant at 0.05 level (when identified by *)*

Information technology is able to act directly improve organizational performance.

Confirmation of the first hypothesis showed no significant effect of information technology on organizational performance (Table 1). The findings of this study provide meaning that information technology has not been able to directly play a role in improving organizational performance. Thus the first hypothesis (H1) which suggested that a significant effect of information technology on organizational performance has not been proven. Not significantly influence the results of the study are the same as Weil, (1992); Barua et al., (1995); Rai et al., (1997) examined empirically no association of information technology on business performance. Similarly, the empirical study by Markus and Soh, (1993); Loveman, (1994), Hitt and Brynjolfsson, (1996) who found that there was no relationship of information technology on business performance.

The results of interviews with several informants researchers explain that the cause of information technology has not been able to improve the performance of information technology organizations purchased was due not to think in the long run, so that when a change of operating system (eg Windows A is replaced with Windows B), the hardware will no longer compatible with the new operating system, as well as software (C) that have been installed previously also no longer compatible with the new operating system and the hardware. Substitution operating system is finally pose a bigger problem when the system is integrated between suppliers, manufacturers, and customers. Replacement of the operating system that occurs in one of the companies will require adjustments in the company's other partners in order to do a thorough replacement of information technology. So it is not set up the ability HR (human resources) that have a high ability as a result of advanced

information technology capabilities, and when that information technology has been installed, then the other problem is when the company should take care (maintenance) information technology. Care information technology is not easy and cheap, because when information technology has been purchased from a vendor, then the company will depend on the vendor. This is due to the vendor knows is exactly what advantages and disadvantages of information technology installed at the time of manufacture and information technology systems, it is this which makes the company to be very dependent on the vendor.

SCM practices will be able to mediate the role of information technology in improving the performance of organizations

Confirmation of the second hypothesis with the approach path analysis proved that no significant effect of information technology on organizational performance, but significant effect of information technology on SCM practices. While SCM practices significantly influence the performance of the organization. This suggests that the practice of SCM is able to mediate information technology to improve organizational performance. Thus the proposed second hypothesis (H2) states that SCM practices capable of mediating role of information technology in improving organizational performance is acceptable (loading factors in Figure 1). The test results showed SCM practices to improve organizational performance in line with research conducted by Lindskog and Wennberg, (2002) which proved that the use of information technology systems to support SCM, the results clearly show that the use of new technologies improve the efficiency of the supply chain and improve the overall performance of the company. The test results expand the statement Bayraktar et al., (2009) reported a positive relationship between the use of information technology systems in SCM practices and firm performance.

VI. CONCLUSIONS AND FUTURE RESEARCH

Information technology is used in large-scale manufacturing companies in East Java has not been able to assist the operational manager job SCM / Logistics in improving organizational performance. Software (software) and Network (network) integrated internally and externally to be a determinant of the success of information technology for the use / utilization of information technology in large-scale manufacturing companies in East Java in improving organizational performance. Creating proximity to customers (Customer relationship) and the closeness of the relationship with the supplier (supplier Close partnership), companies doing long-term contracts with suppliers and customers in implementing SCM practices became a critical success for the use / utilization of information technology in large-scale manufacturing companies in East Java in improving organizational performance.

Priority on meeting the needs of enterprise customers (meeting customers' requirement) with a low level of product damage, accuracy quantity, price and time (on time in full) to the customer to be decisive for the success of SCM practices in improving organizational performance. Proximity to the company's customers (customer relationship) and the closeness of the relationship with the supplier (supplier Close partnership), the SCM practices can become the key to success in integrating the role of information technology in order to improve organizational performance for large-scale manufacturing companies in East Java.

For future research needs to consider the variables of human resources in the occupation or use of information technology, include ISO 9000 and TQM practices as mediating variables of information technology on organizational performance, and it is possible to add new indicators on SCM practices and organizational performance.

VII. LIMITATIONS

The research was carried out on certain large industries, the population in this study and has not fully incorporate other types of major industries such as the list of names of large-scale enterprises in the Department of Industry and Trade in East Java. Results of this study can only be generalized to populations of major industries studied, because of the limitations of research to include other types of major industries as the population in this study. This study examined the use of information technology as an infrastructure and manufacturing industries have not measured the ability of human resources towards mastery of information technology as a key to the company's successful long-term orientation.

Notes on contributor

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