

The Impact of TQM System on Supply Chain Performance through Supply Chain Integration and Employee Satisfaction

Ivan Kristianto¹ and Zeplin Jiwa Husada Tarigan^{2*}

^{1,2}Faculty of Business and Economics, Petra Christian University

Jl. Siwalankerto 121-131, Surabaya 60236, Indonesia

*Corresponding author, email: zeplin@petra.ac.id

Abstract

Indonesia has entered the Southeast Asian free trade market or better known as ASEAN Economic Community (AEC). The economic growth and the increasing number of companies annually will bring some impacts on the competitions for many companies in Indonesia, so they have find their competitive advantage. The biggest competitive advantage of Indonesia is in the primary sector companies which is producing consumer goods from natural raw materials and semi-finished goods. To win the competition, the primary sectors require product standards as the company output by implementing TQM, which usually adopts ISO as the main requirement for exporting their products. This is also the criteria for the research samples. The questionnaires are distributed to 100 companies that have over 100 employees, and the returned questionnaires are 64, with four incomplete questionnaires, making the response rate of 60%. The data analysis is using PLS and proves that all hypotheses are accepted. First, TQM implementation has a positive and significant impact on supply chain integration. Second, TQM implementations in companies are able to create a proper documentation system for each department to facilitate good communication among departments. Third, TQM implementation has a positive impact on supply chain performance and employee satisfaction. Fourth, supply chain integration has a positive impact on employee satisfaction and supply chain performance. Employee satisfaction has a positive effect on supply chain performance. The overall impact of TQM implementation on supply chain performance is 0.4680. TQM implementation brings a positive impact on supply chain integration and supply chain performance, thus increases the total impact of supply chain performance.

Keywords: TQM system; supply chain integration; employee satisfaction; supply chain performance.

1. Introduction

In recent globalization days, the competition between companies is increasing especially in Indonesia. The economy is significantly growing from years before. In 2015, Indonesia's growth is 4.88% from 2014. The economy growth is 5.02% that year. Indonesia has industrial growth in 2013. 23,698 big industry companies in 2013 are growing to 26,322 companies in 2015 (<https://www.bps.go.id>). The performance growth of a company needs increasing process, products and service to satisfy the customer need and as the added value. Growing performance of a manufacturing is focused on its operation, they are materials procurement, production process, supply control, distribution and customer sales. This process is called Supply Chain Management (Wong et al., 2017).

The comparison of some countries in Asia is by some criterias, such as Japan and Korea is highly competing in industrial technology. Singapore, Malaysia, Indonesia and Philliphines are competing in human capital-intensive industries. Last, China, Thailand and Indonesia are competing in unskilled

labor-intensive industries (Jayadi and Aziz, 2017). The comparison in Asia, for Indonesia and Vietnam are focusing on primary sectors that is producing directly from nature materials such as palm, rubber, cocoa, plywood etc. On the other hand, Malaysia, Thailand and Singapore are on the secondary sector. Primary sector needs its standard for the products for the company's output by implementing ISO as the main requirement to export. ISO has been approved by 203 countries in the world, so that is mandatory to implement ISO for Indonesian companies. Besides, the ISO implementing cost on a certain countries is cheaper than Indonesia.

The performance growth of a company is by increasing the supply chain performance, because a manufacturing company is always focusing on the efficiency of resource and the effectiveness of the system built by the company. Fantasy et al., (2010) say the business of the company is determined by the effectivity and the efficiency of information from supplier to producer or service provider to consumers. Besides, there are intergarated and controlled process which is started from planning, material control, logistic system, company service and information

stream. Ou et al., (2010) study that improving the company performance is an effective way to increase the competition. Other than supply chain management to improve the company's improvement, the company also need to improve the plans and manage the activities such as in material plan, supply management, capacity improvement and doing flexibility and building the relationship with the suppliers. The competition of manufacturing products today is causing companies to design the effectiveness and efficiency production of the system and process to lower the cost. In East Java, many companies use SCM to reduce production cost, it is easier to control supplier to make guaranteed product, and also the demand response for distributor is faster. This condition is caused from the internal of the company to communicate faster and properly so it needs supply chain integration (Suprpto et al., 2017).

Supply Chain Integration is a collaborating result in company's internal and external management. It needs information stream faster between departments in the company, such as in marketing department in entering data to computer system, so at the moment, all accessible departments are able to get the information, including warehouse in preparing the demand. This system is required if applying SCM to improve the performance. Indonesian companies are already using this system, but the connection is not in real-time. However, if the company uses SCM, it is the company's duty to do Supply Chain Integration first to improve the company performance. Supply Chain Integration helps a company to understand their resource and ability internally and externally to consolidate their supply chain entirely in the effort of improving long term performance (Huo, 2012). According to Kocoglu et al., (2011), the effect of Supply Chain Integration (SCI) towards Supply Chain Performance (SCP) is positive. Flynn et al., (2010) also study that SCI effect is positive toward SCP. They also state that SCI is a critical to increase an organisation.

The implementation process of SCM to a company to assure that between departments in a company is intergrated well. Supply Chain Integration in a company will give data directly to user and key user. They will process the data to make the information usable for decision maker. Data speed gives satisfaction to user and key user to make their job easier. In other words, before expanding it to external intergration with supply chain, a company have to develop internal intergration which includes social process like teamwork between the social actors from various functional area (Zhao, 2011). A worker will have high employee satisfaction if he/she have a good relation-

ship between workers and have the ability to develop it (Gordon & Hartman, 2009). From those studies, it can be concluded that good internal integration factor influences employee satisfaction in an organization.

SCM implementation is determined by a company management through all the head of the related departement is called key user and the staff that uses the SCM system is called user. Key user and user are the key system in a company whether or not it is successful. User satisfaction and key user as employee satisfaction is the most important thing in running SCM system in a company. Employee satisfaction has its linkages to many aspects in an organization such as work motivation, leadership, behavior, conflict, and employee's morale. According to Latif (2013), employee satisfaction has significant impact toward organizational performance and supply chain performance. Employee satisfaction is related to productivity and it influences company's profitability. Employee satisfaction in running the system well will increase company's performance. Yee et al., (2008) state that employee that has a good level of satisfaction will likely to involve and dedicate in giving service and working in focus, so it helps the company in developing Supply Chain Performance. Rotenberry & Moberg (2007) say in his research that employee satisfacction has positive influence SC Performance.

The competition of manufacturing and exporting products are tight, so the main requirement is having ISO (International Standardization Organization). In indonesia the government uses SNI (Standar Nasional Indonesia). Standard ISO 9000 : 2005 which is used as the reference has been adopted to SNI ISO 9001 : 2008 with the term integrated quality management system. ISO and SNI are implementation from TQM (Total Quality Management) which is done by manufacturing companies and recognized by the government. This standard is set and used by all the companies to evaluate the ability of an organization or manufacturing company in fulfilling customer requirement, and the applying rules and regulations for the products distributed in Indonesia. This standard suggests adoption approach process when in arranging, applying and improving the effectivity of the quality of management system, to improve customer satisfaction (Suprpto et al., 2017).

Total Quality Management (TQM) is a proper system in increasing process, product and service in a company that uses SCM (Supply Chain Management). TQM is an approach of increasing the systematic quality to company's management that aims in increasing the performance of quality, productivity, customer satisfaction and profitability (Gharakhani et al., 2013). Many empirical and developing researches

support the direct relationship between the application of TQM and the improvement of Supply Chain Performance (SCP) in an organization (Easton & Jarrell, 1998). Casadesús & Castro (2005) shows how close the relationship between TQM and SCP, in conclusion, TQM has positive influence to SCP that makes an organization superior in competing. Besides, there are many proofs from the research of Harmon and Peterson (1990) that TQM increases the performance of company potency. Some other researches find that TQM companies dominate the companies that are not implementing TQM.

Terziovski and Hermel (2011) study that TQM has significant influence to Supply Chain Integration. In Flynn and Flynn (2005) research, they also realize that TQM has influence to SCI organization. The good TQM is able to give positive influence on SCI, so it establishes and creates competitive superior in an organization. The result of TQM application is usually a new quality, policy, structural organization, operation process and way to evaluate the performance and change. They are influenced to the employee's daily tasks and employee satisfaction. The important aspect of TQM is empowering employee to involve in their job and participating in taking decision.

2. Literature Review

SCM is an integrated approach starting with planning and material control, logistic, service and information stream from supplier to service provider to Client (Fantazy et al., 2010). SCM is the most effective way for a company to improve its performance (Ou et al., 2010). SCM practice is defined as sequence activities of a n organization to promote the effectiveness of supply chain management (Li, et al., 2009); As applying approach of integration, management and coordination of offer, demand and the relationship to satisfy the clients effectively (Wong, et al., 2005). The manufacturing products will be distributed to distributors and will be continued to users. The company is also doing collaboration with distributor in distributing the products.

According to Kocoqlu et al., (2011), there are four important indicators to measure the supply chain performance. They are total cost of the company, the benefit of the asset of the company, the company's supply chain performance, flexibility and the response to the customer demand. Lambert and Cooper (2000) explains that the last purpose of the company in managing supply chain is by creating benefit to consumer. The benefit is such as the competitive of

product price, higher quality product, faster response to a problem or customer demand, flexibility in fulfill consumer demand, and the accuracy of time shipment. The research of Li et al. (2009) states that supply chain performance can be measured from six indicators. They are shipment accuracy, the effectivity of inventory turnover and the period of supply purchase to selling, the period from ordering to shipment, and the efficiency of production process, the ability to detect the product existence and missing opportunity cost and total logistic cost.

In supporting these things, a company is coordinating strongly by sharing data between companies to establish company consisted of many departments that will become a unity. This defines supply chain integration (Wong et al., 2017). Data integration in the entire departments is the ability of an organization to manage practice, procedure, information, decision by collaborating and adjusting between different areas, in the end it fulfills consumer's need (Flynn et al., 2010). Wong et al., (2017) states that internal supply chain integration is data integration between departments in a company by indicators as follow: The convenience in accessing the other unit data, the integration of report from the company units, information of data availability is able to access every interested party and the data accuracy between units is reliable. Kuo's Research (2016) states that TQM implementation has positive influence to supply chain integration in Taiwan companies. Vanichchinchai & Igel (2011) states that TQM implementation influences the practice of supply chain in integrating with internal collaboration between departments. Fernandes et al. (2014) also states that management quality is needed to improve supply chain integration in adjusting the available system to run SCM practically.

TQM is a systematic quality improvement approach for company management to increase performance in quality, productivity, customer satisfaction and profitability. Kuo (2016) studies that TQM is a process to push the system to reduce the cost produce high quality product, increasing customer satisfaction and employee empowerment. Bhat & Rajashekahar (2009) states that TQM has six elements as a successful key in implementing it and also as an indicator of the study. They are confidence, training, teamwork, leadership, recognition and communication. Employee satisfaction in work does not only depend on the attitude to the work, but also depend on the person's hope to the work (AL-Hussami, 2008). Indicator used to measure employee satisfaction is pay, promotion, supervision, working, self and relationship with other workers.

3. Research Framework Concept

TQM is also defined as integrated quality management in a system used to reach customer satisfaction by involving all the components in a company (Jacob et al., 2013). TQM implementation in a company is able to give contribution to adjust its condition by external shifting. TQM implementation in a company will reduce the excess cost especially in quality cost. First is valuation cost, which is costing a company to value its product such as evaluation, product checking or material testing. Second is precaution cost, which is company use to avoid the failure or damage of its product such as quality engineering, new product evaluation, product/process design, or process control in every department. Third is internal failure cost. It is a cost when a company is unable to reach specified requirement before the product is delivered to customer, such as damaged product, product reevaluation, product quality lowering etc. Fourth is external failure cost. It is a cost related to delivered cost, such as customer complaint, material product returned by customer, warranty and some other costs.

TQM and information technology implemented in a company will develop internal supply chain and produce a unity. The data are accessible and monitored by connected departments. This condition gives communication, coordination and collaboration between departments run well. It will give a good work environment to the employees. Both of these systems are usually applied by medium to big companies in East Java. Employee satisfaction in a company is determined by the well-organized system, as the result the employees are able to follow the procedures as agreed upon. Data between departments that have been connected will make the supervision run properly and well. This system is also guaranteed that the employees will develop their skill by giving proper training, because it is the causal to a quality system (Prajogo & Brown, 2004).

In the research of Chang et al., (2010) practical TQM in an organization in employee training, empowerment, compensation, and organization leadership influences the employee satisfaction and loyalty. Alsughayir (2014) states that practical TQM in Saudi telecommunication company increases the employee satisfaction. Karia & Asaari (2006) also states that TQM affects employee satisfaction. Zahari & Zakuan (2016) studies the same impact. They find TQM influences employee satisfaction and performance in manufacturing company in Malaysia. The first hypothesis (H1) TQM implemented in a company influences the Employee Satisfaction.

According to Kuo (2016), TQM implementation gives positive impact to satisfaction in Taiwan company. Vanichchinchai & Igel (2011) say that TQM implementation influences the practical supply chain in integrating internal collaboration between departments. Fernandes et al., (2014) say that quality management is needed to improve supply chain integration in adjusting the available system practically to run SCM. Second hypothesis (H2) is the implementation of TQM in a company influences Supply Chain Integration. Jacobs et al. (2016) also learns that supply chain integration influences the employee satisfaction with internal communication in a manufacturing company in China. The company facilitates the warehouse inventory in real-time. The third hypothesis (H3) is that Supply Chain Integration in a company influences Employee Satisfaction. The system built by a company by implemented TQM system and Internal Supply Chain Integration will satisfy employee to five improvement to Supply Chain Performance. Information technology system is built as a unity in internal supply chain integration. This will give the information to shipment department to locate the product position and the warehouse inventory to facilitate the shipment schedule. It supplies turnover effectivity of buying to selling process. It determines the period of purchasing to shipment process and the efficiency of production process. It will also determine shipment performance, and the ability to locate the product, and the missing opportunity cost (Li et al., 2009). Supply chain performance of a company is obtained by empowering all the components ability as a main power in implementing TQM (Sinha et al., 2016).

Ardianto & Natsir (2014) study that TQM practice gives positive impact to supply chain performance in reducing lead time, improving inventory turnover, reducing damaged product, reducing production cost and adjusting customer demand. Fourth hypothesis (H4) is TQM applied in a company is able to give influence to Organizational Performance. Kocoglu et al. (2011) state that Supply Chain Integration (SCI) gives impact and improvement to Supply Chain Performance (SCP). The conclusion of the study is that SCI has positive impact to SCP. Flynn et al., (2010) also studies that the impact of SCI to SCP and Business Performance is positive. Vanichchinchai & Igel (2011) states that TQM implementation influences SCP in Thailand companies in reducing production cost and improving the company flexibility and responsiveness. The research of Ardianto & Natsir (2014) states that SCI in integrating internal and external function gives positive impact to SCP in reducing lead-time, damaged product and production

cost, and increasing inventory turnover and customer demand. The Fifth hypothesis (H5) is Supply Chain Integration gives influence to Organizational Performance. According to Latif (2013), Employee Satisfaction has significant influence to Organizational Performance and Supply Chain Performance. According to Yee et al., (2008) the good Employee Satisfaction will make the employee in involving and dedicating to give high quality service that help company in developing Supply Chain Performance. Menon (2012) say that company leader satisfaction will improve the performance of SCM in a company especially in productivity with the process of employee flexibility, organization team and employee training. The sixth hypothesis (H6) is Employee Satisfaction influences Organizational Performance. Based on the six hypothesis above, it can be illustrated the concept of the study (Figure 1).

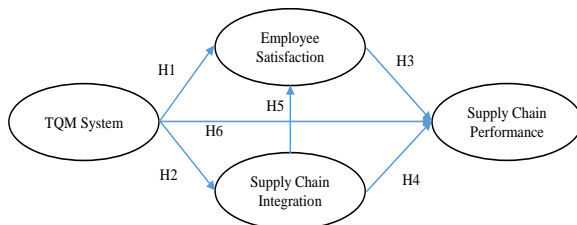


Figure 1. Research Framework Concept

4. Research Method

Quantitative research is a research method that is based on positivist philosophy, is used to analyze certain populations or samples, data collection uses research instruments, quantitative or statistical data analysis with the aim of testing hypotheses has been applied (Sugiyono, 2013). The sample consideration in this study is as follows: manufacturing companies that have implemented ISO in Surabaya, the company has implemented information technology in the company in an integrated manner so that between departments are able to access data from other departments, a minimum workforce of 100 people or more. This research is conducted using the Partial Least Square (PLS) method. The measurement model shows that the indicator variables represent exogenous and endogenous variables are measured. The structural model shows the estimation strength between exogenous and endogenous variables, so to estimate the structural equation model, first a measurement model is carried out then proceed with the analysis of structural models (Latan & Ghozali, 2013). Data distribution is carried out to East Java manufacturing companies with a one-year distribution of data to 100 companies, and returned questionnaires are 64 with

four incomplete questionnaires, so the data response rate of 60.0%.

The characteristics of respondents based on ERP user department in manufacturing companies in East Java with departments 22 respondents (4%), production department of 11 respondents (20%), marketing department of 10 respondents (19%), department of material management (purchasing) of 7 respondents (13%), quality assurance or quality control department for 4 respondents (7%), PPIC (Planning production inventory control) department for 11 respondents (20%), and warehouse department for 9 respondents (17%). The data above shows that all departments have been represented. This shows the level of ERP technology needs in the department to help the process of obtaining fast, precise and accurate data that will be used as one of the decision making processes and implementation of TQM as an ISO form required for all departments in order to get the ISO certificate that the company wants. The biggest respondents are from the production, marketing and PPIC, because of a process that directly gives satisfaction to customers through the process of making products. Marketing has a function that is directly related to customers, so they understand the customer's desires directly. The production is in charge of making goods and PPIC which requires the implementation of ISO on the company. Characteristics of respondents are reviewed based on the position, and the results are as follows: general manager position of 6 respondents (11%), managerial positions of 29 respondents (54%), assistant manager positions of 7 respondents (13%), supervisor positions or senior staffs of 12 respondents (22%). The most number obtained in the middle manager position are manager, assistant manager and supervisor, each of them is 54%, 13% and 22% and with a total of three is 89%. The three positions are responsible for the success of ERP implementation in the company and the user is directly the result of data analysis from the ERP system to assist in decision making. Besides, the three positions are also the makers of the ISO procedure manual for the department and the person responsible for checking work instructions in the department. This position also provides signatures on each data form in their respective departments.

5. Analysis and Discussion

Data collection is obtained at manufacturing companies in East Java to find out how the TQM system is build in the company and is able to increase supply chain integration. TQM systems are built for procedure manuals, work instructions and forms

among departments. While data integration is built from the properly arranged company forms as the data are integrated with the company's information technology system. The existing data integration is intended to provide better internal integration of supply in order to provide satisfaction for company employees. This condition aims to provide increased supply chain performance. Testing of the suitability of the model through validation testing on PLS is done with the Goodness of fit outer model. The measurement model or outer model with reflexive indicators is evaluated by convergent and discriminant validity of the indicators and the composite reliability.

Table 1. Cross Loading Value of Research Variables

Indicators	Employee Satisfaction	Supply Chain Integration	Supply Chain Performance	TQM Implementation
X.1.1.	0.300	0.247	0.287	0.596
X.1.2.	0.302	0.201	0.319	0.546
X.1.3.	0.495	0.469	0.515	0.749
X.1.4.	0.410	0.399	0.462	0.654
X.1.5.	0.510	0.593	0.512	0.653
X.1.6.	0.410	0.451	0.483	0.568
X.2.1.	0.642	0.776	0.567	0.533
X.2.2.	0.539	0.769	0.525	0.407
X.2.3.	0.640	0.763	0.515	0.411
X.2.4.	0.643	0.674	0.634	0.567
X.2.5.	0.591	0.736	0.542	0.522
X.3.1.	0.700	0.688	0.504	0.494
X.3.2.	0.705	0.664	0.518	0.474
X.3.3.	0.646	0.469	0.489	0.516
X.3.4.	0.788	0.611	0.702	0.468
X.3.5.	0.702	0.550	0.669	0.463
X.3.6.	0.767	0.545	0.592	0.416
X.3.7.	0.763	0.554	0.584	0.526
X.3.8.	0.773	0.732	0.684	0.541
X.4.1.	0.634	0.686	0.777	0.552
X.4.2.	0.579	0.607	0.763	0.559
X.4.3.	0.447	0.361	0.588	0.241
X.4.4.	0.460	0.494	0.590	0.476
X.4.5.	0.657	0.510	0.705	0.539

Based on the data in Table 1, all values of the loading factor are above 0.5. When compared to the item described, the variables are higher in value compared to the item describing other variables so that it can be said to have fulfilled the element of validity. The output data from the PLS software are obtained as follows: for the TQM implementation variable of 0.797; Employee Satisfaction of 0.902; Supply Chain Integration of 0.817; and Supply Chain Performance of 0.721. The composite reliability value requirements have been met by all variables as all values are above 0.7.

The output results from PLS with R-square values are all greater than 0 (zero) for the dependent

variable. The value of dependent variable Employee Satisfaction is 0.730; Supply Chain Integration is 0.517 and Supply Chain Performance is 0.471. Whereas for Q-Square obtained from calculations $(1 - (1 - 0,730) (1 - 0,517) (1 - 0,471))$ is 0,931, which is greater than zero, and shows the model has a predictive relevance.

The causality relationship developed in the hypothesis on this model needs to be tested by testing the null hypothesis. This hypothesis states that the regression coefficient between relationships is not different from zero through the t-test as in the regression analysis. The testing of the hypothesis in this study is carried out by testing the inner model of the exogenous latent variable towards endogenous and endogenous latent variables towards endogenous.

The gamma coefficient of TQM implementation of supply chain integration is 0.6660 and a T-statistic of 9.2620, higher than T-table of 1.96 (or Pvalue of 0.0000 <0.05); it means that there is a significant impact of TQM implementation on supply chain integration with a significance level of 0.05. This reflects that the implementation of TQM in the company is able to build a documentation system on each department properly so it facilitates and increases a better communication among the departments. Good communication between departments within the company provides good data integration. This illustrates that management is able to build and create good cooperation between employees of manufacturing companies in East Java as it can build supply chain integration by facilitating data access so that reports on the work results of company units are integrated. This integration is able to build competitiveness for East Java manufacturing companies. This research is in line with Kuo's research (2016) stating that TQM implementation has a positive impact on supply chain integration in Taiwanese companies. This research is in line with a research conducted by Vanichchinchai & Igel (2011) stating that TQM implementation has an impact on the practical supply chain in carrying out integration by conducting internal collaboration between departments. This research is also in line with Fernandes et al., (2014) saying that quality management is needed for supply chain integration to adapt to the existing system so that SCM can be practically implemented. This research is in line with the research of Ardianto & Natsir (2014) which states that total quality management practice has a positive impact on supply chain management in the integration of internal and external functions of the organization.

Table 2. Result for Direct effect and T-value

Effect	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Employee Satisfaction -> Supply Chain Performance	0.4360	0.4370	0.1400	3.1030	0.0020
Supply Chain Integration -> Employee Satisfaction	0.6930	0.6930	0.0850	8.1930	0.0000
Supply Chain Integration -> Supply Chain Performance	0.2680	0.2500	0.1230	2.1700	0.0300
TQM Implementation -> Employee Satisfaction	0.2030	0.2060	0.0930	2.1920	0.0280
TQM Implementation -> Supply Chain Integration	0.6660	0.6850	0.0720	9.2620	0.0000
TQM Implementation -> Supply Chain Performance	0.2390	0.2560	0.1030	2.3310	0.0200

The gamma coefficient of TQM implementation to employee satisfaction is obtained by 0.2030 and T-statistic of 2,1920, higher than T-table of 1.96 (or Pvalue 0.0280 <0.05); it means that there is a significant effect of TQM implementation on employee satisfaction with a significance level of 0.05. This illustrates that the implementation of TQM in companies is able to build a documentation system in each department properly as it facilitates communication among departments and good cooperation between employees, and brings impacts on employee satisfaction. This illustrates that management is able to build and create good cooperation among employees of manufacturing companies in East Java as it is able to build employee satisfaction within the company, which results in employees as key persons being satisfied with the supervision given in their work and employees as key persons satisfied with their colleagues in work. This condition builds employee satisfaction within the company with the implementation of TQM in the company. This research is in line with Kuo's research (2016) stating that TQM implementation has a positive impact on satisfaction in Taiwanese companies. TQM implementation can provide employee development, compensation systems for companies, and employee training. This research is in line with the research of Chang et al., (2010) which states that practical TQM in organizations through conducting employee training, employee empowerment, employee compensation, and organizational leadership has an impact on employee satisfaction and loyalty.

The gamma coefficient of TQM implementation on supply chain performance is obtained 0.2390 and T-statistic of 2.333, higher than T-table of 1.96 (or Pvalue 0.0200 <0.05); it means that there is a significant impact of TQM implementation on supply chain performance with a significance level of 0.05. This reflects that the implementation of TQM in the company is able to build a documentation system for each department properly as it facilitates communication among departments and good cooperation between employees, and brings some impacts on the company's performance in providing product prices

that can compete with other companies and create high-quality products. The results of good communication and collaboration with employees enable to reduce the cost of product and product excellence for the company. This research is in line with a research conducted by Vanichchinchai & Igel (2011) stating that TQM implementation has an impact on supply chain performance in Thailand in reducing production costs, corporate flexibility and corporate responsiveness. Supply chain integration to employee satisfaction has a beta coefficient of 0.6930 and a T-statistic of 8.130, which is higher than T-table of 1.96 (or Pvalue of 0.0000 <0.05); it means that there is a significant impact of supply chain integration on employee satisfaction with a significance level of 0.05. Supply chain integration in companies is indicated by the ease of accessing other unit data and the integration of reports on the work of company units, and enabling to provide satisfaction to company employees because it is able to provide satisfaction to employees as key persons to the supervision given at work and work colleagues. This research is in line with the research of Jacobs et. al., (2016) which states that the impact of supply chain integration has an impact on employee satisfaction with internal communication in manufacturing companies in China, because it can access the warehouse inventory on a voluntary basis.

Supply chain integration toward supply chain performance is obtained the beta coefficient of 0.2680 and T-statistic of 2.1700, higher than T-table; it means that there is a significant effect of supply chain integration on supply chain performance with a significance level of 0.05. Supply chain integration in companies is indicated by the ease of accessing other unit data and the integration of reports on the work of company units and can provide the company's performance in providing product prices that can compete with other companies and create high-quality products. This research is in line with research conducted by Vanichchinchai & Igel (2011) stating that the practical supply chain in carrying out integration by conducting internal collaboration between departments can provide increased performance

in Thailand in reducing production costs, corporate flexibility and corporate responsiveness. This research is also in line with the research of Ardianto & Natsir (2014) which states that supply chain integration in the integration of internal and external functions of the organization has a positive impact on supply chain performance in reducing lead time, increasing inventory turnover, reducing damaged products, reducing production costs and adjusting accordingly company customer request.

Employee satisfaction to supply chain performance has a beta coefficient of 0.4360 and a T-statistic of 3.1030, higher than T-table of 1.96 (or Pvalue of 0.0020 <0.05); it means that there is a significant impact of employee satisfaction on supply chain performance with a significance level of 0.05. The company can provide satisfaction to employees as key persons to the supervision given in their work and coworkers in work, and employee satisfaction has an impact on the company's performance in providing product prices that can compete with other companies and create high-quality products. This research is in line with the research conducted by Menon (2012) which states that leader satisfaction in the company will provide performance in SCM companies with the flexibility of employees, organizational teams, and employee training will be able to improve performance especially in productivity.

The impact of TQM implementation through supply chain integration on supply chain performance obtains a beta coefficient of 0.3020 and T-statistic of 2.9900, higher than T-table; it means that there is a significant impact of TQM implementation on supply chain performance through supply chain integration with a significance level of 0.05. TQM implementation in companies is able to build a documentation system in each department properly so that it facilitates communication between departments and good cooperation between employees in the company as indicated by the ease of accessing other unit data and the integration of work reports of company units, and the company performance can provide product prices that can compete with other companies and create high-quality products. This research is in line with a research conducted by Vanichchinchai & Igel (2011) stating that TQM implementation has an impact on the practical supply chain in carrying out integration by conducting internal collaboration between departments to provide performance improvements in Thailand in reducing production costs, corporate flexibility, and corporate responsiveness. The implementation of TQM in companies enables to build a documentation system in each department properly as it facilitates good communication between

departments and good cooperation between employees in the company as indicated by the ability to provide satisfaction to employees as key persons to the supervision given to their work and work colleagues to make an impact on the company's performance in providing product prices that can compete with other companies and create high-quality products.

6. Conclusion

The implementation of TQM in companies is able to build a documentation system on each department properly as it can facilitate better communication among departments. Management is able to build and create good cooperation between manufacturing company employees so it is able to build supply chain integration. TQM implementation has a positive and significant impact on supply chain integration. TQM implementation has an impact on employee satisfaction which is shown by employee satisfaction as a key person for supervision and satisfaction with work colleagues. TQM implementation has a positive impact on supply chain performance. Supply chain integration in companies is indicated by the ease of accessing other unit data and the integration of reports on the work of company units, and is able to provide satisfaction to company employees because it provides satisfaction to employees as key persons to the supervision given at work and work colleagues. Supply chain integration has a positive impact on employee satisfaction. Supply chain integration has a positive impact on supply chain performance. Satisfied company employees enables to provide satisfaction to employees as key persons to the supervision given in their work and coworkers in the work that has an impact on the company's performance in providing product prices that can compete with other companies. The overall impact of TQM implementation on supply chain performance is 0.4680. TQM implementation can have a positive impact on supply chain integration and supply chain performance, thereby increasing the total influence of supply chain performance creating high quality products. Employee satisfaction has a positive impact on supply chain performance.

References

- Al-Hussami, M. (2008). A study of nurses job satisfaction: The relationship to organizational commitment, perceived organizational support, transactional leadership, transformation leadership, and level of education. *European Journal of*

- Scientific Research*, 22(2), 286–295. Retrieved from <http://www.eurojournals.com/ejsr.htm>
- Alsughayir, A. (2014). Does practicing Total Quality Management affect employee job satisfaction in Saudi Arabian Organizations, *European Journal of Business Management*, 6(3), 169-175.
- Ardianto, Y.T. & Natsir, M. (2014). Hybrid Strategies Study : Total Quality Management Practices and Supply Chain Management as a New Antecedent to Improve the Performance of Manufacturing in East Java, *European Journal of Business Management*, 6 (30), 1-11.
- Bhat, K. S., & Rajashekhar, J. (2009). An empirical study of barriers to TQM implementation in Indian industries. *The TQM Journal*, 21(3), 261–272. <https://doi.org/10.1108/17542730910953031>
- Casadesús, M., & De Castro, R. (2005). How improving quality improves supply chain management: Empirical study. *TQM Magazine*, 17, 345–357. <https://doi.org/10.1108/09544780510603189>
- Chang, C.C., Chiu, C.M. & Chen, C.A. (2010). The effect of TQM practices on employee satisfaction and loyalty in government. *Total Quality Management & Business Excellence*, 21(12), 1299-1314.
- Easton, G. S., & Jarrell, S. L. (1998). The effects of total quality management on corporate performance: An empirical investigation. *The Journal of Business*, 71(2), 253–307. <https://doi.org/10.1086/209744>
- Fantazy, K. A., Kumar, V., & Kumar, U. (2010). Supply management practices and performance in the Canadian hospitality industry. *International Journal of Hospitality Management*, 29(4), 685–693. <https://doi.org/10.1016/j.ijhm.2010.02.001>
- Fernandes, A.C., Sampaio, P., & Carvalho, M.D.S. (2014), *Quality Management and Supply Chain Management Integration: A Conceptual Model*. International Conference on Industrial Engineering and Operations Management Bali, Indonesia, 773-780, January 7 – 9.
- Flynn, B. B., & Flynn, E. J. (2005). Synergies between supply chain management and quality management: Emerging implications. *International Journal of Production Research*, 43(16), 3421–3436. <https://doi.org/10.1080/00207540500118076>.
- Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management*, 28(1), 58–71. <https://doi.org/10.1016/j.jom.2009.06.001>.
- Gharakhani, D., Rahmati, H., Farrokhi, M. R., & Farahmandian, A. (2013). Total Quality Management and Organizational Performance. *American Journal of Industrial Engineering*, 1(3), 46–50. <https://doi.org/10.12691/ajie-1-3-2>
- Gordon, J., & Hartman, R. L. (2009). Affinity-Seeking Strategies and Open Communication in Peer Workplace Relationships. *Atlantic Journal of Communication*, 17, 115–125. <https://doi.org/10.1080/15456870902873184>
- Harmon, R. L., & Peterson, L. D. (1990). Reinventing the factory: productivity breakthroughs in manufacturing today. *Reinventing the Factory: Productivity Breakthroughs in Manufacturing Today*, 303.
- Huo, B. (2012). The impact of supply chain integration on company performance: an organizational capability perspective. *Supply Chain Management: An International Journal*, 17(6), 596–610. <https://doi.org/10.1108/13598541211269210>
- Jacobs, M.A., Yu, W. & Chavez, R. (2016). The effect of internal communication and employee satisfaction on supply chain integration. *International Journal Production Economics*, 171, 60-70.
- Jayadi A., & Aziz, H.A. (2017). Comparative advantage analysis and product mapping of Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam Export Products, *Journal of Development Economics*, 2(1), 12-27.
- Karia, N. & Asaari, M.H.A.H. (2006). The effects of total quality management practices on employees' work-related attitudes", *The TQM Magazine*, 18(1), pp.30-43, <https://doi.org/10.1108/09544780610637677>
- Kocoglu, İ., İmamoglu, S. Z., İnce, H., & Keskin, H. (2011). The effect of supply chain integration on information sharing: Enhancing the supply chain performance. *Procedia - Social and Behavioral Sciences*, 24, 1630–1649. <https://doi.org/10.1016/j.sbspro.2011.09.016>
- Kuo, C.C., (2016). Effects of total quality management implementation and supply chain management capability on customer capital, *The Journal of Global Business Management*, 12 (2), 47-60
- Lambert, D., & Cooper, M. (2000). Issues in Supply Chain Management. *Industrial Marketing Management*, 29(1), 65–83. [https://doi.org/10.1016/S0019-8501\(99\)00113-3](https://doi.org/10.1016/S0019-8501(99)00113-3)
- Latan, H., & Ghozali, I. (2013). Partial Least Squares: Concept and Application Path Modelling using Program XLSTAT-PLS. Badan Penerbit Universitas Diponegoro, Semarang, Indonesia.

- Latif, M. S. (2013). Impact of employee's job satisfaction on organizational performance., *European Journal of Business and Management*, 5, ISSN 2222-1905 (Paper) ISSN 2222-2839.
- Li, G., Yang, H., Sun, L., & Sohal, A. S. (2009). The impact of IT implementation on supply chain integration and performance. *International Journal of Production Economics*, 120(1), 125–138. <https://doi.org/10.1016/j.ijpe.2008.07.017>
- Menon, S.T. (2012). Human resources practices, supply chain performance, and wellbeing, *International Journal of Manpower*, 33(7), 769-785.
- Ou, C. S., Liu, F. C., Hung, Y. C., & Yen, D. C. (2010). A structural model of supply chain management on firm performance. *International Journal of Operations & Production Management*, 30(5), 526–545. <https://doi.org/10.1108/01443571011039614>
- Prajogo, D. I., & Brown, A. (2004). The Relationship Between TQM Practices and Quality Performance and the Role of Formal TQM Programs: An Australian Empirical Study. *Quality Management Journal*, 11(4), 31–42.
- Rotenberry, P. F., & Moberg, P. J. (2007). Assessing the impact of job involvement on performance. *Management Research News*, 30(3), 203–215. <https://doi.org/10.1108/01409170710733278>
- Sinha, N., Garg, A.K., and Dhall, N., (2016) Effect of TQM principles on performance of Indian SMEs: the case of automotive supply chain", *The TQM Journal*, 28(3), pp. 338-359, <https://doi.org/10.1108/TQM-10-2014-0086>
- Sugiyono. (2013). Metode Penelitian Manajemen. *Alfabeta*, 820. <https://doi.org/10.1177/004057368303900411>
- Suprpto, W., Z.J.H. Tarigan, and S. R. Basana. (2017). The influence of ERP system to the company performance seen through innovation process, information quality, and information sharing as the intervening variables. *ICEMT*' 17.
- Terziovski, M., & Hermel, P. (2011). The Role of Quality Management Practice in the Performance of Integrated Supply Chains: A Multiple Cross-Case Analysis. *Quality Management Journal*, 18, 10–25.
- Vanichchinda, A., & Igel, B. (2011). The impact of total quality management on supply chain management and firm's supply performance, *International Journal of Production Research*, 49, 11, 3405-3424.
- Wong, C.K.K., V.K.S. Liew, and M.A. Arip. (2017). The impact of ASEAN free trade area on Intra-ASEAN manufacturing trade. *International Journal of Business and Society*, 18 (3), 633-643.
- Wong, C. Y., Stentoft Arlbjörn, J., & Johansen, J. (2005). Supply chain management practices in toy supply chains. *Supply Chain Management: An International Journal*, 10(5), 367–378. <https://doi.org/10.1108/13598540510624197>
- Yee, R. W. Y., Yeung, A. C. L., & Cheng, T. C. E. (2008). The impact of employee satisfaction on quality and profitability in high-contact service industries. *Journal of Operations Management*, 26(5), 651–668. <https://doi.org/10.1016/j.jom.2008.01.001>
- Zahari, M.K. & Zakuan, N. (2016). *The Effects of Total Quality Management on The Employee Performance in Malaysian Manufacturing Industry*, Proceedings of Academics World 49th International Conference, Istanbul, Turkey, 27th – 28th
- Zhao, X., Huo, B., Selen, W., & Yeung, J. H. Y. (2011). The impact of internal integration and relationship commitment on external integration. *Journal of Operations Management*, 29(1–2), 17–32. <https://doi.org/10.1016/j.jom.2010.04.004> <https://www.bps.go.id/linkTabelStatistik/view/id/1053>