

Contribution of supply chain quality management on operations performance of manufacturing companies in Vietnam

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DOI: <https://doi.org/10.56293/IJMSSSR.2022.4531>

IJMSSSR 2022

VOLUME 4

ISSUE 6 NOVEMBER – DECEMBER

ISSN: 2582 - 0265

Abstract: An organization's ability to operate efficiently and effectively in a competitive environment is heavily reliant on the operations performance. Therefore, the important objective from companies is enhancing and optimizing the operations with several procedures. Within the context of manufacturing industry, supply chain quality should be considered as an effective strategy to achieve the success. This article examines how organizational operations performance can be impacted by supply chain quality strategy

It is first suggested a conceptual framework to characterize these connections, after which a regression model is used to examine them. Data are gathered through surveys of Vietnam manufacturing companies in order to test this model. The following are several of our key empirical findings: employee training provides the largest impact, supplier relationship creates a considerable effect and process management is the smallest-impacted determinant.

Keywords: supply chain quality management, quality management, operations performance, Vietnam

1. Introduction

Quality management, involved with the process of supervising all activities and tasks that must be completed in order to maintain a desired level of excellence, contributes significantly to the success of businesses nowadays. According to Ben-Daya et al. (2020), this process includes establishing a quality policy, developing and implementing quality planning, assurance, control and improvement. For companies, the procedural method to solving operational problems is quality improvement (Aggarwal et al., 2018) and this would support the competition in the fiercer environment (Abbas, 2019). To be more specific, businesses are being compelled to adhere to methods whose efficacy has already been established by the current competitive business market, severe global legislation for environmental protection, and growing customers' worries over product quality and characteristics. Therefore, increasing the level of quality may enhance business performance and provide a shortcut to successful path of any organizations (Aggarwal et al., 2018).

Organizational operations performance must be considered as the target for implementing quality strategy. Many obstacles stand in the way of service providers providing high-quality, cost-effective care and new approaches in service design and delivery. Constant changes in product development, shorter cycle times, and increased employee effort to meet demand and customers' expectations in the modern business (Gunasekaran et al., 2019). More particularly, the operations decision-making process must be highly appreciated and the quality strategy is suggested to be handled prior to other decision (Ben-Daya et al., 2020). Levels of managerial decision-making are typically categorized according to the length of time the choice will have an impact and as a result, there's usually a split between strategic, tactical, and operational planning. Quality management and supply chain management have recently been integrated as part of a newer concept called supply chain quality management (Vanichchinchai and Igel, 2010; Fernandes et al., 2014; Machado et al., 2019). This can be defined as measurement, analysis, and improvement of products, services, and processes to create value and ensure the satisfaction of intermediate and end customers through the formal coordination and integration of all partner organizations in the supply channel (Machado et al., 2019) and the procedure has been viewed as a systems-based approach to performance improvement that leverages opportunities offered by upstream and downstream relationships with suppliers and customers by bringing higher level of operations performance (Peng et al., 2019).

In this study, the author would concentrate on the contribution of supply chain quality strategy on operations performance with the research objective falls onto manufacturing companies in Vietnam. It has become increasingly important for Vietnamese manufacturers to adopt SCM principles as a means of more effectively, efficiently, and financially meeting customer expectations. Managers now place a greater emphasis on customer and supplier participation in problem-solving and quality-improvement processes, information exchange, and supplier selection based on quality concerns rather than price (Phan et al., 2019). Supply chain quality management that is effective in a developing market like Vietnam will, however, not be cheap. The uncertainty of macroeconomic policy necessitates businesses to secure competent leadership and a sustained commitment on the part of senior executives and break through the constraints imposed by a culture of business that has historically prioritized the establishment of temporary business alliances. The remainder would present a literature review, methodology, findings and discussions and conclusion.

2. Literature review

2.1 Supply chain quality management

Supply chain management integrates all parties along the value chain into one single organism and manages them like the assets of a large company, taking a methodical and integrative approach to managing the operations and interactions among diverse stakeholders in supply chains (Fernandes et al., 2014). And with the addition of quality, Supply chain quality management is distinct from product quality. There would be fresh issues if managers apply product quality evaluation to supply chain quality assessment (Zhong et al., 2019).

Generally, operational advantages from using supply chain management strategies include shorter manufacturing lead times, lower costs, quicker product creation, and higher quality (Forster et al., 2010). It may also contribute to the achievement of quality management goals. One of the most essential ways to quickly, accurately, and profitably meet market demands is through the use of supply chain quality management (Peng et al., 2019). Therefore, enhancements to supply chain quality management are correlated with gains in organizational operational performance (Phan et al., 2019).

Moreover, in light of the recent study trends, supply chain quality management and quality management are regarded to have synergy with one another, and quality management in a company is the key to improving performance across the whole supply chain. As a result, it broadens the viewpoint of quality management and supply chain management to include the collaboration of all members, showing a tight link between quality management and supply chain management that improves supply chain performance (Zhong et al., 2019). According to Forster et al. (2010), quality management in the supply chain should be seen as an all-encompassing strategy for improving supply chain performance. This strategy should focus on the dynamics between internal, upstream, and downstream processes. In recent years, researchers have begun to view quality management in supply chains as a multi-faceted concept that encompasses both internal quality management (such as process management, product/process design, quality training, and so on) and quality management activities carried out at the supply chain level (cooperation with customers and suppliers, quality training at supply chain level, involvement of various members in product design and so on).

2.2 Supply chain quality management and operations management

Because the global competition is becoming more and more intense, supply chain management concepts and technology are becoming more prominent as a strategy to achieve business success. This supply chain management trend encompasses quality management activities, providing additional support for the premise that product quality is merely one part of quality-oriented continuous improvement programs that contribute to competitive leadership (Robinson and Malhotra, 2005).

This relationship has been highly emphasized in public attention, thanks to the globalization of supply chains and the decentralization of production, that in order to fully benefit from the potential of quality management and it is necessary to give equal weight to the processes that occur upstream and downstream in the supply chain (Ben-Daya et al., 2020). Not only does the quality of a product rely on the quality processes of its producer, but also on its suppliers.

The supply chain quality management system is an additional source of competitive advantage that may assist companies in dealing successfully with the global and demanding environment of today. Individual companies are unable to compete effectively as standalone organizations; rather, they must participate as active members of the larger supply chain, which is comprised of a network of various companies and connections (Machado et al., 2019). The supply chain quality management, as a whole, may become more competitive by improving its operational efficiency and the quality of its services, which will allow the company to respond effectively to difficulties and capitalize on opportunities.

However, in order to maximize the performance of the company, it is required to conduct an analysis of the procedures related with the implementation of supply chain quality management. According to Vanichchinchai (2014), a combination of supply chain management methods with total quality management practices results in a high degree of performance in supply management. Key aspects of successful financial performance include customer response, strategic customer buying, and supply chain management (Peng et al., 2019) and the final target should be enhancing organizational operations management. Because globalization has created such intense rivalry in today's marketplaces, businesses have been compelled to find ways to boost their level of competitiveness in order to thrive in such a challenging setting. Companies have come to the realization that excellent quality management and supply chain management are critical success elements that play a vital part in the improvement of organizational competitiveness (Ben-Daya et al., 2020). In the beginning, however, quality management was centered on the internal perspective of quality, which dealt with the management of manufacturing processes and products in order to offer acceptable product design and features that were in line with the expectations of consumers through higher effectiveness in operations management (Zhong et al., 2019). Generally, because of the globalization of supply chains and the decentralization of production, that in order to fully benefit from the potential of operations management, it is necessary to provide better supply chain management practice.

2.3. Supply chain management practices

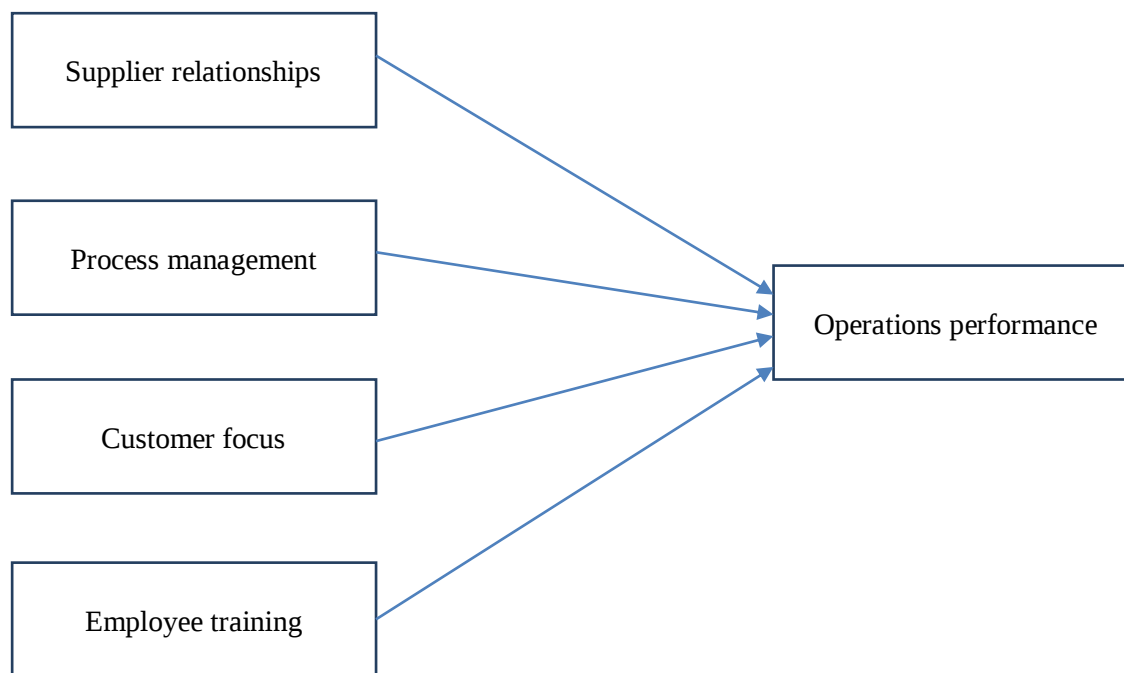
Following this, Fernandes et al. (2014) advocated that quality management techniques in supply chains be divided into three areas, namely internal, upstream, and downstream quality management in order to investigate the influence that these practices have on performance in a variety of nations. Recently, supply chain quality management practices have become more focused on the exchange of information and the management of knowledge between companies, suppliers, and customers (Machado et al., 2019). These practices also involve the utilization of information systems and the most recent internet technology in order to improve quality performance throughout the entire supply chain (Robinson and Malhotra, 2005). Researchers have focused a lot of attention on the effects that supply chain quality management practices have on performance in order to gain a better understanding of how supply chain quality management affects operations management.

Generally, inventory, suppliers, production, information, technological advancements, and quality control are the focus of management and strategic planning in supply chain quality management. On the other side, in terms of quality management, this concept upholds the following values: respect for human resources; adherence to a quality strategy; careful planning; personal accountability; clear lines of authority and communication; and unwavering dedication (Peng et al., 2019; Machado et al., 2019; Salimian et al., 2020). Because the participation and dedication of individuals at every level of an organization is of the utmost importance, it is necessary for those individuals to fully participate in order for their abilities to be put to use for the advantage of the organization. Additionally, the engagement and dedication of the whole supply chain should have a very good effect on the performance of the business (Robinson and Malhotra, 2005).

3. Methodology

3.1. Research model and hypotheses

In this research, there are 04 factors have been chosen as major forces of change for operations management which are supplier relationship, process management, customer focus and employee training.



H1: Supplier relationships has positively impacted on operations performance

The definition of supplier development encompasses all of the efforts that are devoted to enhancing suppliers' capabilities in order for them to work as an integral part of a supply chain and fulfil the needs of a focal organization in addition to achieving the suppliers' individual goals (Abbas, 2019). Traditional supply chain management, in which suppliers are picked mainly on price, may lead to outcomes that discourage an organization from competing in global marketplaces. Buyers believe that their position is enhanced by having a large number of competing suppliers, and companies have come to the conclusion that the immediate benefits of low-cost global suppliers outweigh the long-term benefits of investing in relationships as a result of internet-based technologies (Machado et al., 2019). Finally, suppliers are pitted against one another to obtain the lowest price, and buyers believe that having a large number of competing suppliers enhances their position. Therefore, supplier relationship can be included in the research model.

H2: Process management has positively impacted on operations performance

Supply chain quality management also places a significant emphasis on the process. It is made up of a variety of components, but here we will focus on the three most important aspects that are now being investigated by academics: the delivery of quality, the development of talent, and risk management (Kim et al., 2016). The delivery of quality follows a process flow that begins with product creation and continues with approval of manufacturing, followed by purchase, production and inspection, storage, and finally delivery. Process management a methodical approach to ensuring that operational procedures inside an organization are both effective and efficient (Peng et al., 2019). It performs an analysis of the existing systems, finds places where improvements may be made, and locates bottlenecks. A process management strategy is a long-term plan that continuously examines company processes in order to ensure that they continue to operate at their highest possible efficiency. When carried out effectively, it contributes greatly to the expansion of a company (Baiyere et al., 2020).

H3: Customer focus has positively impacted on operations performance

Customer focus seems to be the priority of modern companies. The company-centric and product-based practices are expanded upon by supply chain quality management, which places an emphasis on the formal coordination and integration of business processes and this can be handled in order to achieve an ongoing improvement in the quality of products, services, and especially by satisfying the customer (Zhang et al., 2017). To be more specific, in the process of customer focus, manufacturers need to develop an integrated quality system in order to synchronize the decisions and activities of the various partners in the supply chain and to capitalize on the

opportunities created by linkages with customers and suppliers so that they can deliver value to their customers in a globally dispersed supply chain (Phan et al., 2019).

H4: Employee training has positively impacted on operations performance

Another aspect needs to be enhanced in the operations management through supply chain quality management is the employee training. Competition in international business is now being waged not between individual companies but rather between the supplier networks of those companies (Vanichchinchai and Igel, 2011). As a result, successful businesses should provide supply chain quality management to improve their organizational effectiveness. The simultaneous deployment of both systems, on the other hand, is difficult and requires a significant quantity of resources owing to the enlarged scope of the project, which encompasses internal functions but also external ones and employee, is the most important asset. Therefore, employee training is considered to be an essential procedure.

3.2. Data collection

With a view to finding out the real contribution of supply chain quality management on operations performance of manufacturing companies in Vietnam, a questionnaire is proposed in order to collect opinions from manufacturing companies in Vietnam about relationship between supply chain quality management and operations performance. Therefore, a data collection process is carried out by launching both online and offline survey in September 2022, in which online channels such as Facebook, Gmail, are remarkably important to approach target respondents.

In a quantitative analysis, sample size depends on the number of variables. According to Hair et al. (2013), the number of observations is required to be at least 5 times higher than the number of question items. In this study, the number of items 23, so that the minimum required sample size should be 115 observations. In order to ensure the reliability of research result, 250 surveys are distributed but only 212 surveys are qualified. This number of respondents meets sample size requirement; therefore, it can be used for a quantitative analysis (Hair et al., 2013).

3.3. Data analysis

In this research questionnaire, all of the question items employ a 5-point Likert scale. Valid data is analysed by SPSS 26 software through the following steps: (i) Descriptive statistics, (ii) Reliability and validity test, (iii) Exploratory factor analysis, and (iv) Regression analysis.

4. Findings and discussions

4.1 Research findings

(i) Descriptive statistics

In the descriptive analysis, it is recognized that the mean for most constructs of the framework is from 3 to 4, which shows the average compliance of manufacturing companies with these statements about supply chain quality management and operations performance.

Table 1: Result of descriptive statistics

Factor	Coding	Mean	Min	Max
Supplier relationship	SR	3.55	1	5
Process management	PM	4.01	1	5
Customer focus	CF	3.73	1	5
Employee training	ET	3.92	1	5
Operations performance	OP	3.66	1	5

(ii) Reliability and validity test

According to the results of the reliability test, all items have high Cronbach's alpha (over 0.7) and high coefficient of item- to-total correlation (0.5-0.8), which suggest the high correlation of these items and confirm the consistency of the measurement variables. With these results, these factors of supply chain quality management and operations performance are mostly reliable and suitable for the next analyses.

Table 2: Result of Reliability and validity test

Factor	Coding	Cronbach's Alpha	Corrected Items – Total correlation
Supplier relationship	SR	0.724	0.592
Process management	PM	0.688	0.717
Customer focus	CF	0.705	0.703
Employee training	ET	0.729	0.614
Operations performance	OP	0.737	0.602

(iii) Exploratory factor analysis

Table 3: KMO and Bartlett's Test Result

Kaiser-Meyer-Olkin Measure of Sampling		.792
Bartlett's Test of Sphericity	Approx. Chi-square	4207.703
	Df	229
	Sig.	0.000

In general, the KMO measure of 0.792 being higher than the minimum level of 0.5 is considered as marvellous statistics (table 3). Moreover, the significance of Bartlett's test of Sphericity is 0.000. As a result, the dataset is appropriate for factor analysis.

In term of exploratory factor analysis, the ideal factor loading is 0.4 because this test has 212 samples (Hair et al., 2013). After running initial step of factor analysis with the use of varimax rotation, 23 items are summarized to five underlying factors. However, item PM4 and ET2 had cross factor loading below 0.4 meaning that these variables are removed from the scale. When running final factor analysis, 21 items are stayed in five underlying factors and all items are strongly loaded in particular factors, meeting the requirements of convergent and discriminant validity (Cohen et al., 1992).

Table 4: Result of Rotated Component Matrix

	Component				
	1	2	3	4	5
SR1					.552
SR2					.592
SR3					.601
SR4					.626
SR5					.681
PM1	.650				
PM2	.648				
PM3	.811				
CF1			.688		
CF2			.438		
CF3			.719		
CF4			.464		
ET1				.814	
ET3				.746	
ET4				.908	

ET5				.758	
ET6				.692	
OP1		.665			
OP2		.615			
OP3		.734			
OP4		.702			

Regression analysis

Pearson Correlation

Table 5: Result of Pearson Correlation among independent and dependent variables

		SR	PM	CF	ET
OP	Pearson	0.515	0.551	0.598	0.680
	Sig	0.000	0.000	0.000	0.000

Note: Correlation is all significant at the 0.01 level (2-tailed)

The Pearson Correlation result of this paper indicates that all variables are positively correlated to operations performance in Vietnamese manufacturing enterprises. Particularly, the value of all correlation is smaller than 0.8; thus, there is no multicollinearity among the independent variables (Gujarati, 2004).

Regression model

Table 6: Result of regression model analysis

	Standardized Coefficients Beta	Sig.	VIF
Supplier relationship	0.221	0.000	1.092
Process management	0.137	0.033	1.061
Customer focus	0.016	0.812	0.983
Employee training	0.343	0.001	0.737
R	0.708		
R Square	0.665		
Adjusted R square	0.603		
Model Significance	0.000		

Overall, the R value is 0.708 revealing a high degree of correlation. The value of adjusted R square is 0.603, hence, it can be concluded that operations performance in Vietnamese manufacturing companies can be explained by 60.3% of Supplier relationship, Process management, Customer focus and Employee training. In addition, with the significant value is 0.000 (lower than 0.05), this model is meaningful enough in predicting the outcome variables.

Regards to independent factors, the coefficient of Supplier relationship, Process management, and Employee training are significant at p-values lower than 0.05, at 0.000, 0.033, and 0.001 respectively. Furthermore, values of the standardized coefficient of these three abovementioned factors are 0.221, 0.137 and 0.343 respectively. In other words, the p-values of Customer focus are over than 0.05 (at 0.812), meaning that this factor has no significant impact on operations performance of Vietnamese manufacturing companies.

As discussed above, it can be concluded that **Hypothesis 1, Hypothesis 2, Hypothesis 3 and Hypothesis 4 are supported;** while **Hypothesis 3 is rejected.** Consequently, the findings confirm the literature that, improvements in three aspects of supply chain quality management (Supplier relationship, Process management, and Employee training) can be positively beneficial to operations performance manufacturing companies in Vietnam.

4.2 Research discussions

From the above research findings, it can be inferred that employee training provides the highest impact on the level of organizational operations performance. The planning and development of jobs with the goal of increasing employee happiness, as well as investments in employee training, are essential components of the service strategies implemented by modern companies (Goldstein, 2009). Due to the relatively large proportion of labor required, many service organizations are required to direct their emphasis on the development of the essential labor component. In the field of employee development, the design and development of systems to manage service personnel contribute to the definition of an organization's service strategy and play significant roles in the implementation of organizational success (Assen, 2020). Therefore, employee training would largely contribute to the process of raising operations performance level. The purpose of employee training is to give chances for workers to increase their knowledge and abilities for the purpose of more effectively collaborating as a team and achieving individual growth and development. More particularly, employees who had received training in self-regulatory techniques reported better levels of job satisfaction than those employees who had not received such training (Vanichchinchai and Igel, 2011). In the production and operations performance literature, various antecedents are reported to increase employee involvement and commitment in improvement programs. These antecedents include empowerment, participation in goal setting, decentralized decision-making, performance measurement system, financial and non-financial rewards, training, and having a common improvement method (Assen, 2020). A common improvement method is defined as a standard set of steps and tools used during improvement projects that promotes a common understanding.

Besides, supplier relationship also creates a strong effect on organizational operations performance. It is important to acquire strategic products (those that have a significant influence on profits and a high level of supply risk) from those vendors with whom the buyer has established long-term, close and collaborative relationships (Adesanya et al., 2020). Instead of focusing on pricing, overall cost should serve as the primary consideration when choosing a supplier for these components. For the sake of maintaining supply continuity, bottleneck items—those that have a minimal effect on profits but a high danger of running out—should be purchased from a single supplier under the terms of long-term contracts and this highlights the importance of selecting the right supplier and provide better supplier relationship (Machado et al., 2019). Supplier relationship may be further connected with supplier development and improvement in competitive advantage, and the efforts that are put in to these areas will lead to profitability for both the customer and the supplier (Joshi et al., 2018). These efforts for supplier development are focusing more on supplier performance and in the same way as acquiring a new supplier every time and producing all of the goods in-house are both solutions that are viable for the buyer, supplier relationship is an emerging and practical option for the buyer to consider (Abbas, 2019). A healthy connection between the company and the supplier has a favorable influence on the performance of the supplier, which is favorably connected to the success of the organization.

Finally, process management is proved to be a the least-impacting determinant of operations performance. In process management, in addition to worrying about operational issues (throughput rates, cycle times, costs, error rates, and so on), organization needs to concentrate on the customer (which is traditionally the domain of marketing), behavioral considerations such as training and remuneration (which is traditionally the domain of human resources), and, of course, financial issues (Silver, 2004). These are the traditional areas of responsibility for each of these departments. In addition, there are significant processes that are essentially contained inside certain functional domains that are distinct from operations. In business process management, technology, tools, techniques, and management methodologies are used with one another to discover, evaluate, and improve business processes. Companies always need to enhance their operations, but some of them are not prepared to explore new prospects and swiftly adjust to the unforeseen situations that are offered by demanding surroundings (Chams-Anturi et al., 2020). Process management, besides, has emerged as an essential method for giving businesses the ability to monitor and adjust ongoing processes as needed, making it more likely that all parties involved will be able to react quickly and effectively. However, process management can be improved in their importance by becoming another aspect of management beside considering only operations performance of the companies.

5. Conclusions

This study focuses on assessing the contribution of supply chain quality management on operations performance of manufacturing companies in Vietnam. Among the selected research scope, survey has been provided and leads to significant findings. The author employed an empirical research model that can handle the relationship of the different variables. Findings can be listed that there is a strong connection between operations performance with 3 determinants: employee training (the largest impact), supplier relationship (considerable) and process management (the smallest impact).

Also, the study demonstrates that it is recommended to coordinate any training on continuous improvement and the common improvement approach with the requirements of both the organization and the people who are engaged, and lead the organization to successful in their modern-market pathway. The foundation for continuous improvement, as suggested by the research results, is from the supply chain quality management practices.

Acknowledgement

This research is funded by Vietnam Ministry of Education and Training (MOET) under grant number B2019-NTH-03: *"The relationship between production capacity of Vietnamese supporting companies and the integration into global supply chain"*

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