

## Conference Paper

# Supply Chain Quality Management Practice Model As an Enabler for Operational Academic Process Toward Excellence Performance: An Explorative Study

Indrianawati Usman, Windijarto, and Rooswanti Putri

Airlangga University, Surabaya, Indonesia

## Abstract

The purpose of this research is to develop the supply chain quality management model by identifying the important factors that contribute to the success in implementation of supply chain quality management in the academic business process. This research is exploratory in nature using case study in the supply chain member of study program's academic process. The approach is by identifying the framework parameter of supply chain quality management. Focus of study is cross-sectional to the member of study program's supply chain, which includes new student admission centers, head of study program, quality assurance centers and career development centers. The information is collected by in-depth interview and data analyzed from the academic process business document. Data analysis is done by open coding, axial coding, and selective coding, identifying relevant concepts and classifying them into several categories. The whole process of coding is done using NVivo 11 Pro software. The result of the article is in identifying the key elements that support the success of the academic business process of the study program in implementing supply chain quality management and presenting the supply chain quality management model implementation, supported by the essential elements found. This research presents the important input regarding the integration of total quality management and supply chain management implementation of the study program's operational academic process in higher education. Results of this study are also valuable for other service industries, especially services that have strong involvement between client and server.

**Keywords:** supply chain management, total quality management, operational academic process, performance measurement

Corresponding Author:

Indrianawati Usman

indrianawati-u@feb.unair.ac.id

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## 1. Introduction

Quality is now viewed as a common supply chain goal and perceived to be the responsibility of all level and actors in the supply chain, particularly in a context of business models. (Soares, Soltani, & Liao, 2017). Quality management has received increasing

attention in supply chain management (Huo, Ye, Zhao, & Zhu, 2015). Supply chain management concepts and models are not just confined to improving business operations in the manufacturing sector. They can also be developed and applied in the service industry by focusing on the service-based supply chain (Gopalakrishnan, 2015). Gopalakrishnan's (2015) study included a holistic empirical study, including the input process and output of the education supply chain. The research was conducted by exploratory research approach. The results provide an understanding of the importance of the contribution of supply chain management in the operational processes of the university. Total quality management (TQM) and supply chain management (SCM) have an important role in improving organizational competitiveness (Sila, Ebrahimpour, & Birkholz, 2006). The synergy between quality management and SCM is aimed to improve supply chain performance. Sarrico and Rosa (2016) conducted a study to introduce the concept of supply chain quality management in the field of education. Supply chain quality management is a challenge regarding trust for information sharing, integration and leadership. The implementation success rate of TQM and SCM in organizations is not the same. Some of the factors that influence the success of implementation are corporate culture, investment, business relationships and organizational maturity, organizational characteristics, size, and level of certification of the management system (Dubey, Gunasekaran, & Samar Ali, 2015). This research's objective is to identify the factors that facilitate the implementation of integration between total quality management and supply chain management in supporting the smoothness of business process and improvement of academic performance. Subsequently, it also develops a supply chain quality management implementation model to improve academic performance in study program management.

## 2. Literature Review

Integration of quality management and supply chain management is an effective way for supply chain partner to improve their overall competitiveness (Zhong, Ma, Tu, & Li, 2016). It is a function that can be inside or outside the organization and which can create value chains in creating products and providing services to consumers. SCM is meant as a systemic medium and as a strategic coordination function of an organization. In general, supply chain is an interconnection of a group of organizations that, together, create and deliver products or services to end consumers. However, the current supply chain concept becomes important in the management of interconnection among the units in it to achieve the success of an organization. The definition

of supply chain management has evolved in line with the development of modern business management concepts that focus on supply chain systems to enhance the organization's capacity to achieve its strategic objectives. There are three components of supply chain concept management within the organization, namely: supply chain configuration, supply chain relationship and supply chain coordination (Storey, Ember-son, Godsell, & Harrison, 2006). The importance of supply chain quality practice and its relevance to management practices has received more attention in the literature in recent years. (Mellat-Parast, 2013). A framework of supply chain and TQM practice can be implemented with respect to an organizational structure, environmental conditions and identification of customer orientations (Sharma & Modgil, 2015). There have been many studies about supply chain management and quality management. For instance, research by Vanichchinchai to assess the level of supply chain management and total quality management practice in the automotive industry found that. although SCM and TQM have become critical management systems to achieve competitive advantage in the global market, their contribution can be varied by the degree of success in their implementation (Vanichchinchai, 2014). Gopalakrishnan (2015) conducted a research on university supply chain education. His studies include empirical studies with a holistic view, including inputs, processes and outputs from the educational supply chain. Through exploratory research, it provides a new dimension for education management so as to understand the importance of supply chain in contributing to the success of university operations. As we know, the main contribution of the university includes; skilled human resources and research results which deliver to end users, i.e. communities. Effective education depends on the knowledge, experience and ethics of its personnel. Sarrico and Rosa (2016), conducted a study introducing the supply chain quality management (SCQM) concept in education. The study found that education is an SCM system. SCQM in education is an important challenge, with regards to trust for information sharing, integration and leadership. Instead, the authors found some good practices to be developed in a more systematic SCQM implementation. TQM practice is known as a concept that supports the success of an organization; the principles of TQM and its techniques will also be successful in coupling inter-functional activities within the organization. In line with the increasing needs of inter-relationships and inter-organizations in modern organizations, it requires SCM as a decisive factor

### 3. Research Method

This research uses a qualitative inductive theory building approach through single case study. Inductive theory building is used to construct propositions on unexplored phenomena. This research will focus on the management of higher education that has implemented TQM, which has a quality assurance organization and also has the quality standard and has conducted a quality audit process. This research will develop theories naturally, so the goal is to produce accurate knowledge, parsimonious and generalizable theories. The implementation of a single case study was conducted at Universitas Sebelas Maret Solo (UNS) by interviewing academic staff of the related fields in the formation and achievement of academic excellence on a study program. Interviewees were the head of the study program, the faculty quality assurance team, the university's new admissions center, and the career development center as the final estuary in the supply chain process in the study program as well as the university. Several methods are used in conducting data collection. The main data are semi-structured interviews with two types of informants: quality assurance managers who have responsibility in managing quality assurance in higher education, as well as leaders related to the process of quality assurance practices. Interviews were conducted with the several informants in order to provide enough data needed. Each interview process took 45-90 minutes duration, recorded and then transcribed. Data analysis was performed to build the Supply Chain Quality Management model with open coding, axial coding and selective coding. Analysis begins with open coding to identify relevant concepts of data and group them into categories. The analysis continues with axial coding to develop the relationship between categories and sub-categories. The concepts and categories derived from open coding and axial coding are then linked to the main categories using selective coding. The whole process of coding is done using NVivo 11 Pro software. The concepts and categories and their relationships that arise from the results of coding are compared with the concepts and categories that exist in the library.

#### 3.1. Trust worthiness

Four criteria for maintaining trustworthiness of qualitative research are: credibility, transferability, dependability and confirmability. To maintain research credibility, triangulation method, triangulation of data sources and triangulation theory are used. To maintain transferability, concepts and categories emerging from interview transcripts,

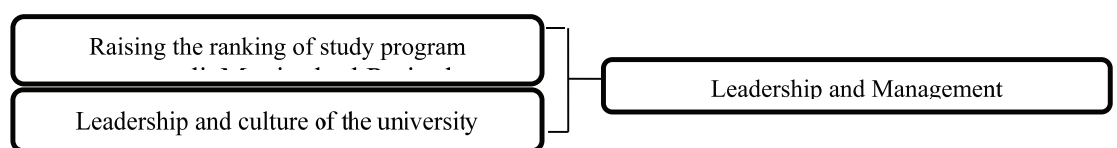
field notes and archive documents are exported to a spreadsheet file. To maintain research dependability, data collection is done until it reaches saturation conditions so that it will produce a consistent category. All interviews are recorded in field notes, recorded and transcribed to avoid bias and influence from the researcher so as to maintain confirmability of the research.

#### 4. Result

The results of field studies involving all supply chain management components that contribute in managing the study program were conducted in order to explore all the components of supply chain activities in a study program. The results of interviews with several informants are presented in two sections, firstly, about the existence and occurrence of total quality supply chain management practice. Second, it will be analyzed using the support model formula and influence total supply chain management practice towards the achievement of academic excellence in the study program. The research found five categories in supply chain quality management practices, namely: leadership and management, information systems and technology, operational academic systems, performance measurement systems, and application behavior of supply chain quality management. Each category is presented in Figure-1 to Figure-5. The image showing the concepts of the category and sub category is followed by the explanation related to the formation of the concepts forming each category created in the practice of total quality supply chain management.

#### Category 1: Leadership and management

Figure 1 shows the results of open coding and axial coding for the first category of Leadership and Management.



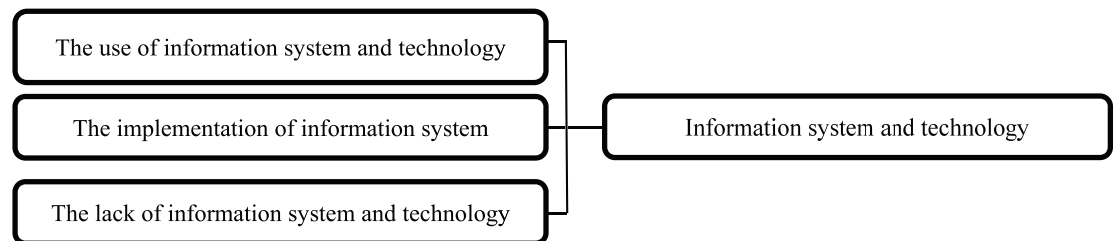
**Figure 1:** Conceptualization and categorization of total quality supply chain management for categories of leadership and management.

Leadership and management that will support the achievement of academic excellence is a leadership that has a high commitment to achieve an improved university ranking and is able to create a conducive university environment, to be able to make

the achievements that continue to increase in accordance with established criteria. The high commitment of leader and management of the Faculty level will support the improvement of program studies' performance. This high leadership commitment is demonstrated through the high effort to achieve maximum performance through limited resources. This Active is the core culture created. Culture is then internalized to the entire academic community. This category of Leadership and Management has three concepts that shape it, namely: improving the university ranking and the leadership and also the culture of the university.

### Category 2: System and information technology

Figure 2 shows the results of open coding and axial coding for the second category of Information Systems and Technology.

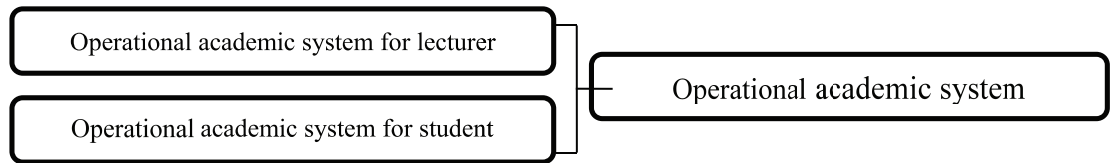


**Figure 2:** Conceptualization and categorization of total quality supply chain management for categories of information systems and technology.

In addition to the above leadership and management, the excellence of academic achievement of a university course cannot be achieved without the support of various stakeholder management within the university. Study program is an important one-point player in the academic operational process within a university. Supply chain management activities can be described with three components: supply chain configuration, supply chain relationship and supply chain coordination. Supply chain configuration is known as supply chain architecture to support the creation of strategic decision implementation in an organization. Categories of information systems and technology produce three supporting concepts, namely: the usefulness of information systems and technology, application of systems and information technology, and lack of information systems and technology.

### Category 3: Academic operation system

Figure 3 shows the results of open coding and axial coding for the third category of Operational Academic Systems.

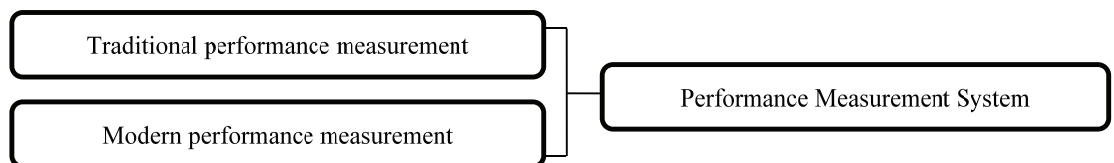


**Figure 3:** Conceptualization and categorization of total quality supply chain management for academic operational system category.

The operational academic system is an important part, because it is a process that determines the outcome or output of a study program. In the learning process, there are two important components that become the major part of the process, namely students and lecturers. Teachers have a very important role, because lecturers are an integral part of the learning process that determines student achievement and graduate quality. The role the lecturer plays is to determine the instruction of material and to drive the knowledge delivery through an innovative teaching process. Students are a major component of the academic operational system, and are a benchmark for the success of an academic operating system through their achievement, i.e. quality and timeliness of passing. Therefore, the formulation of the academic operational system is an important aspect that must be considered to support the qualified academic business process and which can produce graduates and quality research results in accordance with the needs of the community.

#### Category 4: Performance measurement system

Figure 4 shows the results of open coding and axial coding for the fourth category of Performance Measurement Systems.



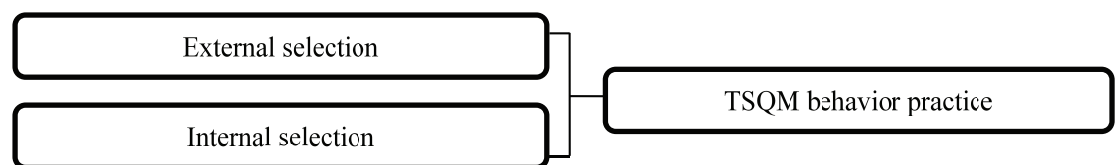
**Figure 4:** Conceptualization and categorization of total quality supply chain management for category of performance measurement system.

A performance measurement system is an activity used to monitor progress over time and to keep the process on a track that is in line with the achievement of the course objectives. Performance measurement is based on the evaluation of the direct superior and peers. Meanwhile, modern performance measurement is done for the objective components, so it can be measured with information system and information technology support. The more components that can be assessed objectively, the role

of modern performance measurement becomes of greater proportion than traditional performance measurement.

## Category 5: Application behavior of supply chain quality management

Figure 5 shows the results of open coding and axial coding for the fifth category of SCQM Implementation Behavior.



**Figure 5:** Conceptualization and categorization of total quality supply chain management for TQSCM implementation behavior categories.

Selection of students and lecturers, who are the two main components in the academic business process, is a factor that determines the behavior in the practice of TQSCM. External selection is through a new student admissions system nationally. Internal selection is a selection conducted to suit prospective students with the conditions to be achieved by the study program, especially with regard to talent owned by prospective lecturers and students in order to be able to produce qualified graduates in accordance with the field of knowledge, as well as the right career in accordance with the field.

## 5. Discussion

The five categories of supply chain quality management practices (i.e. leadership and management, information systems and technology, operational academic systems, performance measurement systems, and supply chain quality management behavior practice, shape relationships and the interactions among the five categories. The commitment of top management in SCM is indicated by various concept names, such as: corporate culture change, management support, participatory management, and cooperation, but, in the SCM and TQM case, the concept is the same. Similarly, customer focus in TQM includes: customer complaints, satisfaction, close partnership with customers, and customer responsiveness, similar to those found in SCM.

In Indonesia, the study program that earned an "A" rating from the National Accreditation Board of Higher Education has generally run quality assurance. Based on the



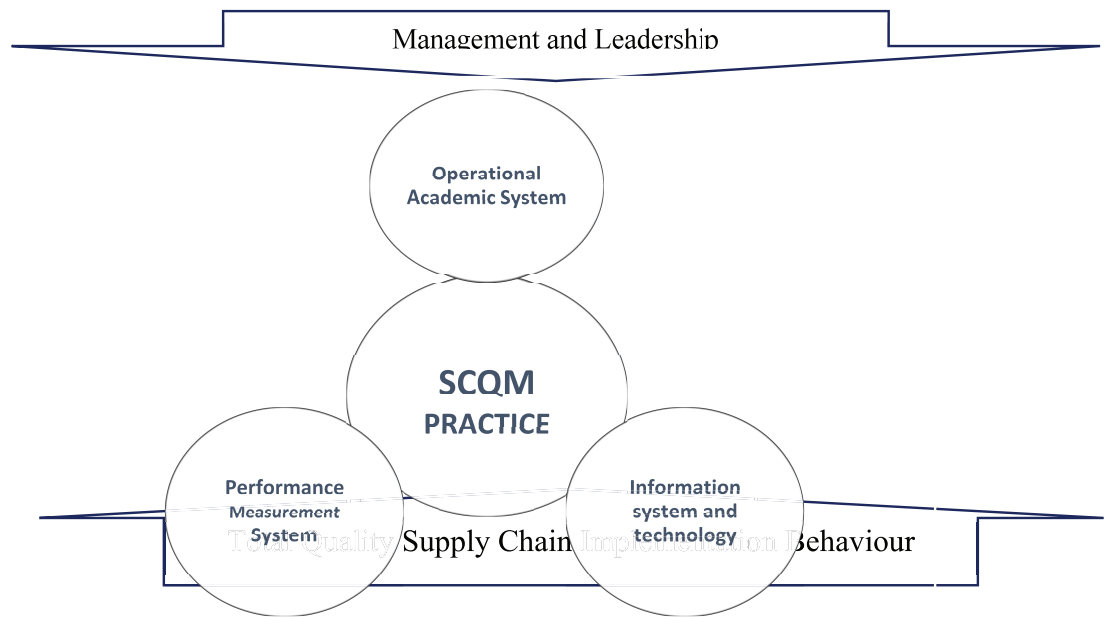


Figure 6: Supply chain management model for academic business process.

observations on some management programs that have been rated “A”, all of them have run quality assurance, but there is no study program that utilizes the supply chain management concept in their strategy design to achieve its performance. This research results in the design of SCQM which integrates total quality management and supply chain management practice to support the study program’s performance to achieve academic excellence. The implementation of supply chain quality management starts from the leadership and management role. Leadership and management build systems so that total quality management and supply chain management can run in college. The first built system is the operational academic system, then the performance measurement system. After both systems are constructed, leadership and management builds systems and information technology to support the running of the operational academic system and Performance Measurement System. The behavior of all members in the college while running the three systems which were built by the leaders will affect the success of the system. The interaction of these five categories constitutes supply chain quality management as an enabler to the achievement of academic excellence.

## 6. Conclusion

Supply chain quality management is formed by the existence of leadership and management, information system and technology, academic operational system, performance measurement system, and supply chain quality management implementation

behavior. The successful application of SCQM is influenced by application behavior by all members of the college. The application of SCQM requires direct intervention and commitment of leaders in supporting all members of the college, so establishment of the three systems can support the achievement of academic excellence. To run the practice of SCQM model, academic leaders must build the three systems which form a requirement of SCQM formation, as seen in Figure 7 above. The formation of three components starts with the development of organizational structure by adding the person in charge who is responsible for the operation of the three systems. Interaction between the three components is done by, first, preparing the academic operational system to achieve the strategic objectives of the study program, then the other two components are prepared to support the academic operational system. Finally, the SCQM implementation behavior is a component as an enabler that can support the implementation of SCQM practice optimally.

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