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Supply Chain Management (SCM) Practices and Continuous Innovation (CI) in Malaysian Automotive Industry

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Abstract: The purpose of this study is to investigate the relationship of supply chain management (SCM) practices and continuous innovation (CI) to be implementing in Malaysian automotive industry. This paper tries to examine how CI can contribute and have a positive impact on the development of SCM practices to achieve better performance in the automotive industry. In addition, by applying the advantages of innovation in an industry, they are able to ensure they have a competitive advantage factor. There are several elements that can be selected to support the CI and SCM practices in the automotive industry. The relationship between structure CI and SCM practices is proved by the use of Structural Equation Model (SEM) as recommended. Since this is a concept paper, most of the literature from the previous survey taken as a basic guide for this study as well as the construction of models of the relationship between the CI and SCM practices is made. Next, the hypotheses can be generated based on the model of the proposed research and literature review. It has been shown that the CI which acts as an intermediary for the Malaysian automotive industry can continue to perform to make the transformation SCM practice management system in the Malaysian automotive industry more efficiently and effectively in line with the industry to be the best among the competitors in other countries.

Keywords: Supply Chain Management, Continuous Innovation, Structural Equation Model, Automotive Industry.

1. Introduction

Centrally located in the ASEAN region with a population of more than 500 million people, Malaysia offers vast opportunities for global automotive and component manufacturers to set up manufacturing and distribution operations in the country. The rapid growth and the high purchasing power of its population have made Malaysia the largest passenger car market in ASEAN. Meanwhile, the establishment of national car projects such as PROTON and PERODUA, has transformed Malaysia from a mere motor car assembler into a car manufacturer. The development of Malaysia's automotive industry has made the country a production center for major automotive component manufacturer.

Organizations assume that innovation is simply the process of idea creation, evidenced by the use of brainstorming to create new ideas, which has been driving force behind product development for decades. The precise use of innovation refers to a continuous process that guides non-stop development of new technologies, new people processes, and new ways of thinking about business expansion.

Continuous innovation, performance measurement methods and tools have been applied in companies as a means to develop improvement actions related to strategic objectives and to monitor results so as to give feedback for further action.

This study aims at filling a gap in literature by empirically testing the relationship of various SCM practices with continuous innovation in Malaysian automotive industry.

2. Literature Review

2.1. SCM Practices

SCM promises competitive advantages for industrial organizations. The introduction of new products and

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services, or entry into new markets, is likely to be more successful if accompanied by innovative supply chain designs, innovative supply chain management practices, and enabling technology. This is a widely accepted premise in business practice today. Various definitions of SCM had stated among the previous researchers with reflect different perspective. According to [1] defined SCM as the management philosophy aimed at integrating a network of upstream linkages (sources of supply), internal linkages inside the organization and downstream linkages (distribution and ultimate customer) in performing specific processes and activities that will ultimately create and optimize value for the customer in the form of products and services which are specifically aimed at satisfying customer demands. Table 1 shown below the summary of SCM definition.

Table 1: Definition of supply chain

Supply chain management	Source
SCM is a wider concept of logistics and the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole.	[2]
SCM is the management and control of all materials, funds and related information in the logistics process from the acquisition of raw materials to the delivery of finished products to the end user.	[3]
SCM is the systems approach to managing the entire flow of information, materials and services from the raw materials suppliers through factories and warehouses to the end customer.	[4]

SCM practices are defines as the set of organization's activities undertake to promote an effective management of its supply chain. Besides, according to [5], the elements of supply chain practices include strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices, and postponement. Table 2 shown below the dimension of supply chain management practices by various researchers.

Table 2: Dimension of supply chain practices

Elements	Source
Strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices, postponement.	[6]
Concentration on core, competencies, Use of inter-organizational, systems (e.g. EDI), Elimination of excess inventory levels.	[7]
Supply chain integration, Information sharing, Supply chain characteristics, Customer service management, Geographical proximity, JIT capability.	[8]
Logistics, Supplier relations, Customer relations, Production.	[9]
Supplier base reduction, Long-term relationship, Communication, Cross-functional teams, Supplier involvement.	[10]
Leadership, Intra-organizational relationships, Inter-organizational relationships, Logistics, Process improvement orientation, Information systems, Business results and outcomes.	[11]

Among the elements in SCM practices stated in Table 2, researcher decided to choose only a few of the elements, which are:

2.1.1. Leadership

Top-level manager have a better understanding of supply chain management's need because they are the most importance people that can recognize the firm's strategic imperatives to remain competitive in the market place [12]. Besides, as a leader needs to have powerful influenced and respect from organization so that supply chain management practices is easy to implement in the organization [13]. Hence, a leader can improve decision making process, effectively and efficiently to enhance organization performance as well as profitability.

2.1.2. Supplier relationship

According to [14] stated that suppliers play more direct role in an organization's quality performance. Through close bonded relationships, supply chain partners are more willing to share risks and reward and be able to maintain the relationship over a longer period of time [15],[16]. Therefore, strategically managed long-term relationships with supplier have positive impact on a firm's supplier performance [17].

2.1.3. Customer focus

Focusing and maintaining the customer relationship will enable the organizations to be more responsive towards customers' needs and will result creating greater customer loyalty, repeat purchase and willing to pay premium prices for high quality product [18]. Besides, the main goals of SCM are customer satisfaction and their loyalty as [19] customer relationship management is an important component of supply chain management practices [20].

2.1.4. Quality information and analysis

Information quality includes an aspect such as accuracy, timeliness, adequacy and information exchanged credibility [21]. Based on [5], organization needs to review their information as a strategic asset and ensure that the information flows with minimum delay and distortion. In addition, [22] also notes that information shared must be accurate so that the best SCM solution will be obtain. The use of statistical tools and technique will also provide information that help to control management to make an effective decision in managing quality for the organization [23].

2.1.5 Internal lean practice

Internal lean practices are the activities of eliminating waste such as cost and time in manufacturing system. The term lean is refer to a system that use less input to produce at a mass production speed and at the same time be able to offer more variety to the end customers [24], [25], [26]. Therefore, lean thinking and lean practices have become very important aspects to achieve SCM effectiveness [5].

2.2 Benefits of Supply Chain Practices.

The great benefit of SCM is when all the channel members including suppliers, manufacturer, distributors and customers behave as if they are part of the same company and be able to enhance performance significantly. Through the interaction of various supply chain practices, the efficiency can be achieved as supply chain practices cannot improve their own efficiencies individually [27].

Although the relationship between Total Quality Management (TQM) and innovation has been studied, there has been limited research investigating the relationship between SCM practices and continuous innovation in organizations.

2.3. Continuous Innovation

There has been growing interest in continuous innovation during the last decade. [28, 29, 30] Basically, the concept of continuous innovation has been applied in some fields, such as product [31, 32], knowledge [33, 34], cooperation [30], [35] and dynamic environments [36].

According to [37], continuous innovation is 'the ongoing interaction between operations, incremental improvement, learning and radical innovation aimed at effectively combining operational effectiveness and strategic flexibility, exploitation and exploration'.

Besides that, [38] state that 'continuous innovation is needed across a broad front' combining extensive 'do what we do better' improvements with periodic and radical 'do what we do differently'.

Continuous innovation also can be defined as the dynamic alignment of today's operational effectiveness and tomorrow's strategic flexibility, achieved through synergistic product and process innovations [33]. Operational effectiveness is embedded in the existing configurations combinations of products, market approaches, business processes, competencies, technologies, organization and management systems that satisfy today's customers' needs. Strategic flexibility lies in the capability to develop new configurations for tomorrow's customers. The alignment of the two contradictory objectives dynamically through continuous innovation in products and processes poses a huge challenge for continuous organizational learning.

2.3.1. Continuous Product Innovation (CPd1)

Innovation in industrial organizations originally meant the development of new products. Continuously product innovation is important practices that support the organizations to actively produce products that meet demand in that time. Product innovation can be defined as the changes of product or services. To be more specific, product innovation is not only focusing on innovation in production firm but the firms itself have to have new or improved service or product. Therefore, product innovations were developed in the Research and Development (R&D) department, and then flows to production, marketing and sales department [33]. This sequential approach was sufficient when the pace of innovation was slow and there was less competition during that time. But at present, the new product innovations process need to be foster and the severe global competition require shortening lead times to be more and more quickly, with less cost but high quality, from R&D to the marketplace, from order to delivery. Currently, operations in the organization have to run in parallel. This requires efficient collaboration between all main functions during the entire life cycle of a product from its first research and development phases to after-sales services and recycling. In order to manage this inter-functional collaboration, process innovation is needed. Hence, innovate continuously is one of the ways so that organizations remains competitive in the market place and achieve organizational performance.

2.3.2. Continuous Process Innovation (CPrI)

In Malaysian automotive industry, innovation plays an important role to gain competitive advantage. Apart of it continuous process innovation are require. [39] has defined process innovation as the changes in product or service delivery and/or development processes as defined method, functionality, administration, or other features. Process innovation also includes improving functions such as strategic planning and implementation, marketing, production, logistics, quality management and human resource management [39] Therefore, it is suitable for automotive industry in Malaysia to implement continuous process innovation so that better product and development process are continuously gain by the organization.

2.3.3. Continuous Managerial Innovation (CMI)

Managerial innovation is a measure to acquire the potentially critical role of human agency in the process [40]. Managerial innovation functions are more focusing on new ways to develop innovative manufacturing processes and advanced. More than that, the process of managerial innovation implementation requires understanding the role of self-assessment and design better tools so as to avoid failure in implementation as supports the study by [40]. Besides, [41] sum up that the process of change is divided into three phases; the first phase is making decisions and design, implementation phase and the phase of use. The three phases include the organization of action in deciding to adopt and implement management innovation designed hence it is used in the context of the organization and eventually when made practice of managerial innovation within an organization and planning. Therefore, as conclude by [42] the scope of what is required by the organization must be really understand by the organization and use of the potential of an organization's progress in order to measure the application performance of managerial innovation. Via supported and facilitated by a number of elements involving organizations especially among workers, the implementation of managerial innovation can be done effectively. Based on several previous studies, there are three elements which are knowledge management, creativity skills and social that may improves change in management [42].

3. A Propose Research Model

The research framework is shown in Figure 1. SCM practices have an impact on continuous innovation both directly and indirectly. Continuous innovation is operationalized by conceptualizing it as a four-dimensional construct. The four dimensions are operations system

continuous product innovation, continuous process innovation, continuous managerial innovation, and continuous quality innovation. Hypotheses relating these variables are then developed.

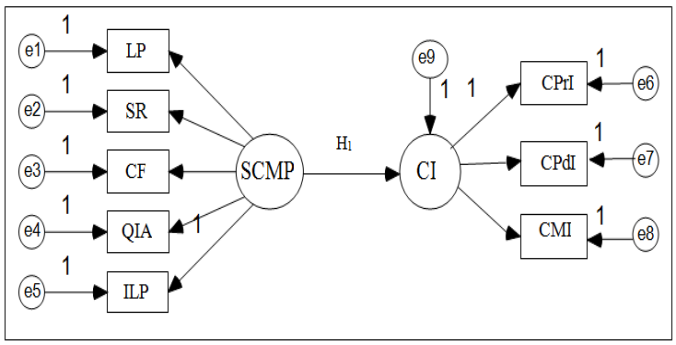

Figure 1: A propose model of the study.

*LP= leadership, SR= supplier relationship, CF= customer focus, QIA= quality information and analysis, ILP= internal lean practice, SCMP= supply chain management practices, CI= continuous innovation, CPrI= continuous process innovation, CPdI= continuous product innovation, CMI= continuous managerial innovation and, CQI= continuous quality innovation.

Therefore, the following hypothesis is proposed, H1.

4. Research Methodology and Hypotheses

In this study, structured questionnaire was use as sampling method. The populations of this study are comprised in Malaysian automotive industry. Next, questionnaire will be distributed to the manager in various Malaysian Automotive Industry. The next process is analyzing the data. Two statistical techniques were adopted in order to analyze the data. First, Statistical Package for the Social Sciences (SPSS) 17th version was used to analyze the preliminary data and provide descriptive analyses such as means, standard deviations and frequencies. Second, Structural Equation Modelling (SEM) using AMOS 6.0 will be used to test the measurement model. SEM technique was utilize to perform require statistical analysis of the data from the survey. Exploratory factor analysis, reliability analysis and confirmatory factor analysis to test for construct validity, reliability and measurements loading were performed. Having analyzed the measurement model, the structural model was then being tested and confirmed.

The supply chain management practice framework developed in this study proposes that SCMP has a direct impact on CI. Therefore, based on the literature review and the research framework, the following hypotheses of the study have been developed:

H1: There is positive and direct significant relationship between SCMP and CI in Malaysian automotive industry.

5. Conclusion

Supply chain management practices and innovation measure are become most importance strategy and it involves local car manufacturer and automotive suppliers. Therefore, it will be an effort for them to become more effective and competitive by enhancing the organization's ability to improve quality, business operation, customers and employee satisfaction, and business performance. The main purpose of the method is to develop new theory or refine existing theory by uncovering new variables and relationships.

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