

Total Quality Management Based On Conceptions, Principles and Systems for Automotive Materials Purchasing Quality Decision and Management

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Abstract— In purchasing of automotive materials and parts, Quality Management is makes a difference. This paper firstly discusses with purchasing quality conceptions and purchasing decision making patterns; secondly studies how to apply total quality management principles; and finally the different development levels of purchasing and quality management system. Some innovative thoughts are exhibited to clarify the misunderstanding and ambiguities.

Keywords— purchasing and supply chain management; purchasing quality management; total quality management; automobile material and component, quality management.

1. Introduction

For quality of product and performance of the business the impact created in the field of purchasing and supply chain management is due to the quality of material purchased, services and components [1][2]. The meaning of quality refers to purchase of quality material. The quality has implications and connections according to Peter Bailey et al [3]. In order to satisfy the customer demand which is special the British Standard Institution (BSI) has defines set of all characteristics and attributes for quality. For emphasizing the quality of goods purchased and its services so far there is no exact definition. In order to refer the qualities of products, services, deliveries and other physical outputs provided by the supplier, the quality of the supplier is judged the supplier his whole expertise and capability in logistics, engineering and supply chain management the system processes these outputs [4]. By this the supplier has to be highly competent

enough.

From the firm's product or production quality management the supply chain management emphasis its applications with different concerning ranges. For quality management system into the purchasing decision making and material management there has been alternative approaches to integrate quality factors and this is being discussed by Perkins and James [5]. On quality output there has been a greater emphasis in very aspects in production and operation process while purchasing in industries improvement for productive inputs a closer supplier relationships advocated under total quality management arrangements are being utilised. For member enterprises the quality management in supply chain there has been expansion from individual enterprise to all of supply chain enterprises, which emphasizes the collaboration and compatibility of quality systems is being discussed by Ma Tang [6]. Is there is an idea to approach in the automobile material field for purchasing and supply quality management to use the modern technique of quality management? The main points of total purchasing quality management are being discussed by Peter Bailey [3]: firstly for link related quality decision all of the members within a supply chain, including the suppliers, employees and customers, should participate. Secondly the systemic procedures and processes that provide these products the management emphasis doesn't focus on the goods and services. thirdly in order to prevent faults through the systemic procedure and processes it is being emphasized not to find out the faults. Fourthly for purchasing quality management continuous improvement and customer satisfaction should be taken as the final goal. One of the key elements of a total quality management policy is

the assurance of an adequate supply of materials and components, which examines the two fold relationship for different purchasing system variables with supplier quality assurance practices, characteristics, wide commitments towards application of quality assurance principles of the company is being dealt by González, Benito et al [7].

There is a scattered and vague viewpoints, and even logic obscurity while researching. For development and implementation of the purchasing quality management theory this will be a disadvantage. In automobile material purchasing practice which aims to build up a holistic framework for purchasing quality management for more by following systematically the conception of purchasing quality management, refine from total quality management principles and systems. New Cement Brand in Existing Market launch is being discussed in [12].

2. Quality Conceptions And Decision Making In Purchasing

The people can select different quality levels and must make difference in quality while taking decisions for purchased goods and services which is not fixed or absolute. People have different goals and methods when selecting quality level while merchandise quality and viewpoints. There are three commodity quality conceptions and there has been three quality decision making styles.

2.1 Perfect quality conception and zero-defect quality decision in purchase management

Attempting to perfection is impossible although perfect quality is without limit, to motivate and guide people marching on to make great efforts in pursuit of perfection an orientation has been setup, for avoiding imperfections and pursuing perfective quality this is being dealt by Womack and Jones. For maintaining the significance for auto material purchasing quality is important. In order to achieve the 100% satisfaction on purchasing quality the purchasers and customers always tend to expect high quality and there is requirement of quality of material to be purchased.

2.2 Practical quality conception and economical quality decision making

Unlike purchasers the suppliers are not so identical

in views. The higher quality needs to pay higher costs the supplier has to adopt a practical attitude and economical consideration got gaining better benefits. Where the whole quality cost is the minimum the right quality should be controlled at the most economical level.

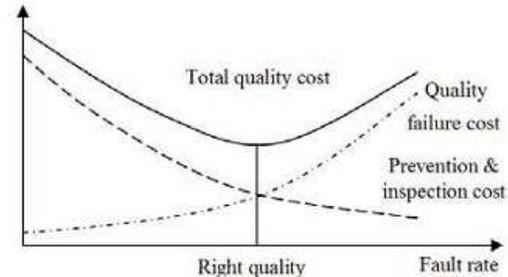


Figure 1. Traditional quality economics decision-making

Prevention or inspection cost and quality failure cost these are two parts [7]. In order to accept the defect standard the cost will increase. Suppliers can only select an appropriate quality level shown in fig. 1 for inspecting the goods the cost is expensive due to the defect inflows of goods in operational system. The modern new viewpoints suggests the so-called “quality authorities”, for preventing and avoiding the faultiness will decrease the cost dramatically it is very costly for the product. Through feedback function, reduce the defect rate which ultimately reduces the expenditures on quality which decreases the fault the expenses spent is being prevented. The modified purchasing quality decision making model may be described like this in fig. 2.

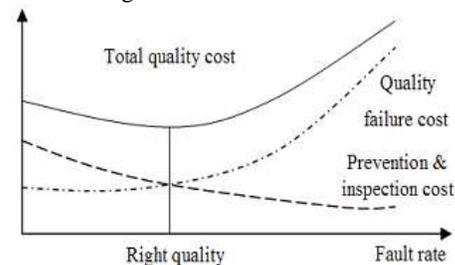


Figure 2. Modern quality economics decision-making

2.3 Relativism quality conception and customer suitability

For quality emphasis which is a relative concept to a customer demand is widely supported on purchasing quality which is widely supported. The customer's standard determines the quality of the product and services for the suppliers. In order to satisfy the customer requirements they main the quality which is being believed by customers as

customer suitability, that refers a material, commodity or service can meet the functions and applicable purposes established by customer.

Firms deservedly choose the suitability as strategic factor of purchasing quality decision-making for the betterment of higher quality that meets the customer requirements in terms of best commodity and services. If the procured merchandises fail to meet or reach the firm's quality requirements the suitability quality decision making methods goes wrong which is worthless and non-effective, if the quality of the purchased goods far exceeds the actual demand, it will bring about diseconomy and inefficiency, and even disturb the proper operations of the firm and the performance of the whole supply chain.

3. Total Quality Management Principle For Automotive Material Purchasing Quality Management

In production and operations management, supply chain management (SCM) the Total quality management (TQM) is the basic principle of modern quality management and the purchasing quality management should be integrated into the TQM theoretical systems. The total purchasing quality management has some special ranges, characteristics and requirements. The total purchasing and supply quality management should comprise the following three contents at least.

3.1 Total range quality management for automotive material purchasing quality management

For the quality of purchased commodities such as materials, equipment's, facilities and services also involve in the quality of purchasing works and suppliers of the firm the management ranges involved in purchasing and supply quality management should not be referred. The critical content for quality management is the quality of the commodities purchased. In order to maintain the quality of the products purchased the high quality of other works is also indispensable. Those of organization design, human resources, purchasing processes and procedures, physical distribution and logistics, information technology, policies, criteria and regulations, measurements of the efficiency and performance, utilizing the tools and methods are included in the qualities of purchasing the works.

For accurate delivery one of the quality

requirements of supplier service is the quality of commodities and services provided by the supplier. The processes, capabilities and competencies of the supplier and their quality is included. As per Robert et al [4] a high-quality supplier must be capable.

3.2 Total process quality management for automotive material purchasing quality management

The total quality management is stated always as beforehand and concurrent as after hand. To detect or inspect the quality of products after the production is finished the fault can be picked out there is a frequently used pattern for hand quality management. In the real time of occurrence of product quality through controlling methods to keep the process within the right range by which it reduces the defective quality for the concurrent management. For forecasting and prevention for the quality problems which rises through improving processes and warning mechanism so as to avoid faults and losses by beforehand management.

Dr Walter A. Shewhart and Edwards Deming suggest originally the plan to do check action (PDCA) which is a general cycle model in quality management. The scientific process of total quality management through which the product quality can reach to continuous improvement for which the PDCA is circulated [11].

3.3 Total membership- involvement quality management for automotive material purchasing quality management

The purchasing quality is everybody's responsibility is implied as Total member quality management. Within the organization should Commit and take active part in all activities associated with purchasing quality management each and every department has to get involved. Various departments and professional persons have more direct and larger duties on purchasing quality management.

The chief executive officer (CEO) is responsible for strategic quality decision-making, and the chief procurement officer (CPO) will participate in making purchasing quality strategies and plans. For purchasing quality management a collective leadership group composed by firm's related top managers is a frequently used. Quality department and its personals traditionally respond not only to inspect and manage the firm's products quality, but also to monitor and examine the quality of the purchased raw materials and commodities.

However, the duties of managing purchasing and supplier quality have now shifted more to strategic sourcing department.

Purchasing or sourcing department and its staffs have sought greater responsibilities for quality at present. The quality of purchased commodities is a concern; represent policy and advices on purchasing quality. To keep in touch with the relevant departments within the firm and suppliers outside the firm constantly the most of duties are undertaken.

Suppliers who have been the important members of the cooperative quality management within a supply chain, has larger responsibilities for purchased commodity quality than before. A team working method in purchasing quality controlling practice has also become an important institutional approach, which includes the internal groups of a firm with the supplier and the customer involvement groups. There appears some particular types such as early supplier involvement (ESI), making specification together with customer, quality research team, quality function deployment team (QFD), value analysis and engineering team (VA/VE), and so on which are in practice.

4. Development Levels Of Automobile Material Purchasing Quality Management System

The total purchasing and supply quality management should establish a systemic management pattern, but there are different situations since the company size, scale, conditions and capabilities are very different in reality. The history and reality, there are approximately four development levels of the purchasing quality management system, which are respectively known as quality inspection, control, assurance & certification related systems, and shown in fig. 3.

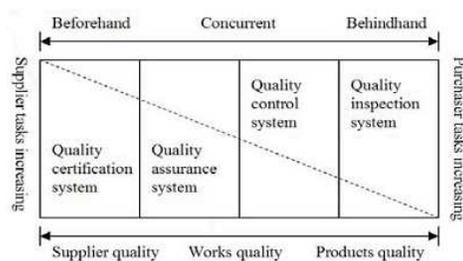


Figure 3. Purchasing quality management systems and the responsibilities and tasks for both buyer and seller

4.1 Quality Inspection system (QIS)

A defect detection system is defined as behindhand quality monitoring system in which the purchasing quality managers, employees check or inspect purchased goods so that the quality situations of the goods can be supervised and felt out in a quality inspection system. The detection system will always bring about some repetitive inspections and a large number of samples, and the defects only dug out afterwards.

A quality inspection system, which is shown in fig. 4, has at least the following requirements and conditions:

- Acceptance /rejection history;
- Testing capability /Workers / Machines;
- Organization and management of quality systems;
- Documented systems /procedures

4.2 Quality controlling system (QCS)

To prevent arising quality problems a defect prevention system is always defined as an early quality warning system or a real- time monitoring system in which the purchasing quality and quality process will be controlled during the event in a quality control system. The prevention system can correct the deviations of the quality or the process in due course, and of course, has larger numbers of difficulties and workloads than the QIS.

A quality control system has mainly the following characteristics and approaches:

- Statistical process control (SPC), shown in fig. 5, emphasizes the quality process management, which pays attention to whether the quality process deviate from the normal range through computing the capability index (CP) or capability index of process (CPK), and the process can be self-corrected by feedback mechanism.
- Statistical quality control (SQC), differing from the SPC to control process, is a direct pattern to control quality itself through statistical method which has the same principle as the SPC.
- Six-sigma (or 6σ) quality control is a program that permits only three defects per million parts and reflects an outstanding quality commitment which is actually a stricter goal and standard for SPC or SQC[4] [9].

4.3 Quality assurance system (QAS)

All of the activities of quality inspection and supervision that make sure the defects or potential

defects can be found can be fallen under quality control system. But the transformation of the quality control into the quality assurance is an evolution of the total purchasing quality management systems.

A quality assurance system includes all of the quality activities and corresponding costs relevant to purchasing and supply processes, such as:

- Product design and test;
- Building up specifications explicitly;
- Evaluating and selecting the right suppliers and make sure them to do a good job;
- Encouraging all the people related;
- Training the purchasing and supply employees.
- Quality inspection and testing;
- Feedbacks to ensure the affectivity of all the measures and steps.

4.4 *Quality standardization & certification system (QSCS)*

The quality assurance system is focuses on the quality of the purchased commodities and concerns the firm's internal quality management, and it involves the quality certification system which depends on the external suppliers and the whole capabilities of a supplier. Through accomplishing the quality certification assessment for the supplier, the QSCS can originally assure the purchasing and supply chain quality. The quality certification can be provided to the customer enterprise, such as the Ford Motor, Haier Electronics, Lenovo Inc. do for their suppliers, or by social organizations, such as the well-known standardization series of ISO 9000 quality certification systems. The ISO9000 quality certification series, other quality validation or process certification systems generally look through the whole quality process and system of a supplier, which mainly contains

- Management duties, including general rules, customer demand, regulatory requirements, quality policy, quality goal and planning, quality management system, and management reviews;
- Resource management, consisting of general rules, human resources, information, infrastructure, job environment and other resources;
- Process management, comprising general rules, the processes related to customer, design and development, purchasing, production and service operations, defect control, after-sale services;
- Supervision, analysis and improvement,

covering general rules, monitoring and survey, data analysis, continuous improvement.

5. CONCLUSION

The auto-material purchasing and supply management focuses on the quality management of the purchasing and supply management under TQM and SCM which is deserving-study problem. Some important issues about the purchasing quality management are being dealt with. These issues that a firm always face implement within their purchasing practices that should be correctly understood.

To summarize three different conceptions about purchasing quality management and the quality decision- making modes based on these conceptions. 1stthese concepts, decisions are all existed, which is reasonable from a certain perspective, and should therefore be considered, combined successfully while making decisions. 2nd investigates how to apply the total quality management principle into purchasing quality management. The total range, process and membership management provide some clues for purchasing quality management a manager should not only cover all aspects practically but also get to the points in every aspect.

Finally the four different levels of purchasing quality management system which turns from lower, simple to high, complex, inspection system, control system, assurance system and certification system, a firm should at least have an inspection system in its purchasing quality management, and then further develop the higher level of quality system. These systems are associated with each other that their relationships should not be comprehended rigidly. These results will be favourable to clear up some confusion in these fields, and of course to build up an important research basis for the sequential studies.

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