

A Review of Manufacturing Quality Chain Management

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Abstract: With the improvement of economic life quality, the quality chain management is paid more and more attention. Any node on the quality chain changes, the rest of the quality chain will also be positive or negative impact. Therefore, more and more scholars pay attention to quality chain management. Before researching quality chain management is still in the primary stage, most of the study only stays at the conceptual level, revealing the black box of quality chain management is imperative. Based on this, this paper first introduces the origin of the mass chain and its development stage is analyzed; Secondly, the paper analyzes and expounds the causes of the quality chain, and defines the concept and characteristics of the quality chain. Thirdly, the paper evaluates and analyzes the research status of the quality chain by using the literature analysis method, finally, the future research direction is prospected.

1. Introduction

With the progress of the times and the rapid development of the national economy, People's basic living needs are met, followed by the continuous improvement of life requirements. The level of quality can reflect the comprehensive strength level of the country and the symbol of the vitality of the enterprise. Under the background of economic globalization, enterprises can meet the market's needs and meet the customers' demands only by cooperating. Therefore, the scope of quality management has also covered all the stakeholders involved in the production of products, the concept of "Quality chain" emerged. Before researching quality chain management is still in the primary stage, most of the study only stays at the conceptual level, revealing the black box of quality chain management is imperative.

2. The Development of Quality Chain Tracing

With the development of the times and scientific progress, People's understanding of quality management is also continually deepening, from shallow to deep, as shown in Figure 1, which experienced six stages [1-5].

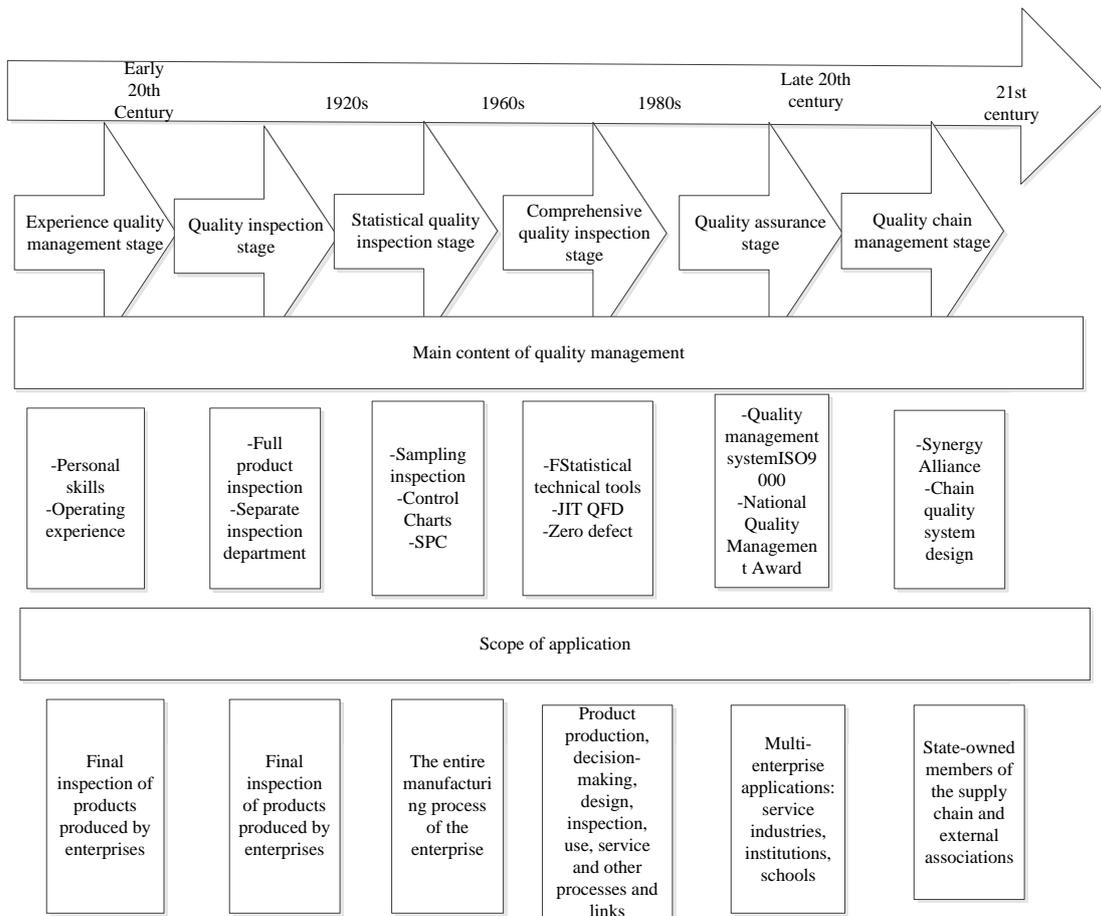


Figure 1: Quality management development phase.

Before the 20th century, quality management is wholly controlled by the experience of practitioners, which is called the experience management stage; From the early 1900s to the late 1900s is the second development stage of quality management theory called the quality inspection stage. At this stage, to further meet the needs of customers and improve work efficiency, some enterprises use the principle of separation of functions in Taylor's scientific management theory for reference and further refine the quality management work, quality inspection activities have been separated from other departments, and a professional system has been established for this purpose [6]. However, this system can only be implemented after completing the product, which is an ex-post control, and can not monitor the quality of the product in real-time. The information is then formed, the non-synchronization of data will have an irreversible negative impact on enterprises' development. For this, the enterprise begins to urge the idea of beforehand control," quality control" emerge as the times require; From the early 1920s to the late 1950s is the third development stage of quality management theory, the location of statistical quality control. To make up for the shortcomings of prior control in the previous step, Shewhart's SPC theory is introduced, and the advantages of introducing statistical mathematical qualitative, and Quantitative analysis into primary custody are emphasized [7]. At this stage, although it solved some problematic problems which could not be solved in the past, it made the enterprises pay too much attention to the application of mathematical methods; From the early 1960s to the 1970s, the connotation of quality management has been expanded, and quality management has stepped into the next stage-total quality management (TCM) stage. With the development of the times, people have overcome past

cognitive errors, the quality management of the whole process, and the theory of total quality management. On this basis, Japan absorbed and expanded, and evolved into the TQC method, which is the symbol of the fourth stage [8]. During the same period, this period is also the quality assurance phase, during which all rules and requirements are translated into face-to-face documentation; On this basis, some scholars, to put forward truly effective systematic measures, integrate total quality management theory with supply chain management, and promote quality management into a brand-new stage, quality chain management stage [9].

The study object of quality chain management is all node enterprises designed on the production chain of product or service; any slippage on either party or friction in working with the node enterprise in direct contact can have a devastating effect on the outcome. Therefore, only good quality chain management can create a win-win situation.

3. Causes and Characteristics of Quality Chain

3.1. Reasons for the Quality Chain

Some scholars have analyzed the traditional quality management model and pointed out its shortcomings, as shown in Figure 2[10]. The whole product manufacturing sales chain, each node of the enterprise quality management activities are carried out alone, not with other enterprises, nor public. This makes the information flow lag, each node enterprises can not timely adjust their own production and management model according to the information flow.

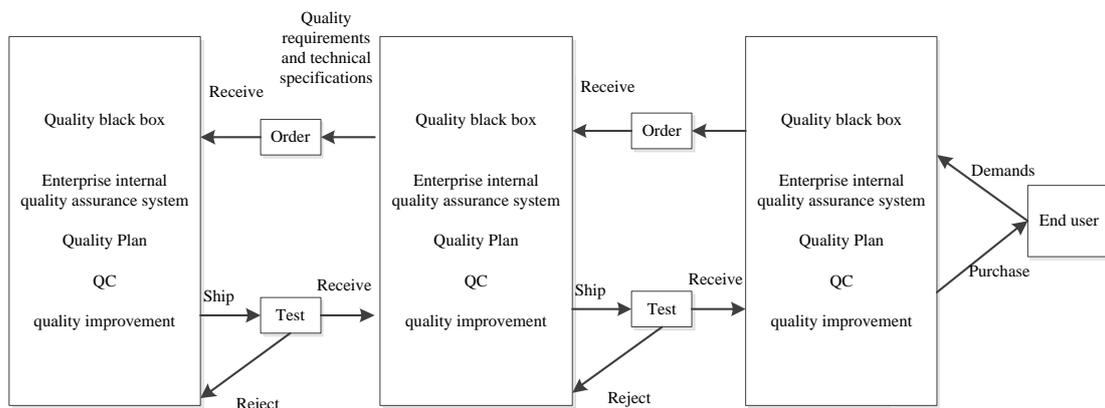


Figure 2: Flow Figure.

3.2. Concept and Characteristics of Quality Chain

The quality chain is a comprehensive link body that covers the whole process of producing goods to meet the needs of customers, and quality chain management is the systematic control of the entire process.

Take the quality chain systematicness as the cut-in point, satisfy the customer demand as the tenet, take the quality chain as the whole as the research object. Therefore, the collaborative management of the quality chain has the following characteristics.

3.2.1. The Enterprise Activity on the Quality Chain will Produce “The domino effect”

The quality chain is a link body composed of many node enterprises, and node enterprises do not work independently but are connected; any node enterprise or even a department within the enterprise will make a positive or negative impact on the whole quality chain.

3.2.2. Core leading enterprises play a major role in promoting

In the quality chain operation process, the enterprise can only be different. Core Enterprises play a leading role in driving the whole quality chain operation and improving the degree of products and services to meet customers' needs [11-12].

3.2.3. Effective liquidity of quality information transmission

The quality information runs through the whole quality chain, and the node enterprise which is closest to the end customer transforms the received customer demand into the information which is easy to flow and welcome to the upstream enterprise which is adjacent to the end customer, each node enterprise needs to participate in it. The effective management of quality flow is of great significance to improve the quality chain's whole management level.

3.2.4. Dynamic property

In the fierce competition environment, node enterprises must have dynamic adaptability to get a better quality management level. It is necessary not only to adjust its management model according to the change of environment but also to adjust itself continuously according to the final service object's requirements. The adjustment of any node enterprise will cause the evolution of other enterprises in the quality chain so that the whole quality chain will present dynamic change.

4 Study status of quality chain management

In 1996, foreign scholar Troczynski first put forward the concept of quality chain management (QCM), considering that QCM is a comprehensive link covering the whole process of producing goods. QCM is a systematic control of the entire process. The essential quality concepts such as quality function deployment and the relationship between them are clarified [9]. At the same time, scholar Joseph Pogonia japonica believes that product quality is formed in the whole process of control, and the rising form is a spiral. Therefore, the concept of quality spiral emerged [10]. Although the appellation of quality chain and the quality spiral is different, their essence is to pay attention to the cooperative attribute between enterprises involved in the whole production process.

Based on the above research, scholars Ding and Zhao probe into the influencing factors of product quality and think that product quality is determined by the interaction of five quality factors and the quality chain formed by the connection [14]. Scholar Tang (2002) put forward the concept of collaborative quality chain management, deconstructed the black box of quality management, and expanded the research scope of the factors that affect enterprise quality promotion; In this study, the concept model of the 3D management model of quality chain is established from the whole point of view, and the advanced concepts such as quality chain node and quality flow are defined [15]; Xie(2002) believes that product quality control is the crucial point to improve the effectiveness of the whole quality chain management, but this is not only to control the enterprise itself but also to manage the stakeholders involved in the quality management chain [16]. Jin and other scholars have summarized and analyzed the meaning and conceptual characteristics of the quality chain and think that the theory of quality chain management can be generalized in an all-round way, which is of great significance in practical application [10]. Cai and others have probed into the structure of the quality management chain, cleared up the closed-loop operation flow of the quality chain, and put forward the corresponding process cost control method [17]. Lan studies the quality management activities from the inside and outside of the primary enterprise, and puts forward some relevant viewpoints [18]. Scholar Lee demonstrated quality chain management

in manufacturing enterprises [19]. Scholars Liu, Xu, Wang, and other related industries (automobile manufacturing, food industry, etc.) of the quality chain management were studied [20-24]. Chen Wei, Sun, and other scholars have studied quality chain management by constructing the SD model [25]. Ming and other scholars have researched the influencing factors of the quality chain [26]. Wang Haiyan et al. investigated the quality chain management in the food industry using the complicated network method [27]. Huang, a scholar, has made an in-depth study on the quality chain in the construction industry [28]. Scholars have studied the synergetic performance of quality chain [30-31]. Through the above analysis, we can see that most of the research on quality chain management is theoretical, few scholars merge case analysis to do empirical research.

5 Conclusion and outlook

We can see that people pay more and more attention to quality chain management through the above analysis. Scholars have also studied the related fields of quality chain management from different angles, further clarify and expand the relevant theoretical research content and scope. However, up to now, the depth of related research on quality chain management is still not enough, most of the research is still at the surface level, the research is carried out around the theory and its connotation, and the research results combined with practical cases are less, the application scope of quality chain is relatively narrow, most of them are automobile industry, food industry as the research object, few of the manufacturing quality chain in-depth study. The manufacturing industry plays a crucial role in China's national economy; therefore, in the future research, the focus can be shifted to the manufacturing industry.

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