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Technical complaint management as a lever for product and process improvement

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ABSTRACT

Complaint management activities have been traditionally seen from the customer relationship point of view, both by researchers and industrialists. Its potential as a driver for quality improvements has been widely neglected in the marketing dominated research field. From a production point of view, root cause analyses of customers' problems pose a valuable base for improvement of products and processes. The paper examines the impact of complaint management activities as levers for improvement in a quality control loop context. Results of an empirical study based on a reference model for technical complaint management are discussed to quantify effects on quality parameters.

1. Introduction

Product quality is seen as one of the critical differentiating factors in today's globalized markets [1]. Especially industries in high wage countries attempt to balance the disadvantage of higher costs by achieving better quality. Several quality oriented programs, like Six Sigma, Total Quality Management and Kaizen, have been set up by firms in order to gain competitive advantage in terms of process and product quality. All of these programs focus on the alignment of organizations to customer needs in order to produce products of higher quality.

Besides these strategic initiatives, what has been widely neglected, is the potential benefit of customer complaints for quality improvement. They are a way of receiving feedback from customers and therefore necessary means for putting into action improvement plans. In addition to that, they are a useful way of measuring performance and allocating resources to deal with the deficient areas of the business [2].

Technical complaint management comprehends all technical related efforts in order to solve the criticized nonconformity underlying a complaint. Accordingly, technical complaint management aims on fast identification of failures, immediate clarification of root causes and long-term prevention of reoccurrence [3].

The causal relationship of complaint management activities and companies' overall financial success factors has been analyzed in empirical studies and found to be statistically significant [4,5]. As opposed to this, the positive impact of complaint management on product and process quality improvements has not been evaluated empirically in literature. Potential reasons for this blind spot are the lack of quality oriented research in the field and the absence of a process model describing the internal work content of technical complaint management.

Accordingly, the paper is structured as follows: In the first part a reference model for technical complaint management is described, which helps companies to structure their internal processes for complaint handling. It serves as a measurement construct for an empirical study whose design is described in the second part of the paper. In the last part, preliminary results of the study are discussed.

2. Complaint management research

Research in the area of complaint management is mainly driven by marketing science. The most relevant underlying theories are Hirschman's exit-voice theory and the disconfirmation paradigm [6–8]. Both theories are used to describe customers' behavior and level of satisfaction. The disconfirmation paradigm explains the satisfaction of customers based on a target-performance comparison of his expectations and the actual product performance [8]. The exit-voice theory, developed by Hirschman in 1970, refers to situations in which a customer becomes dissatisfied with services or products provided by an organization. As a consequence of this dissatisfaction, according to Hirschman, the customer may react in two different ways: exit or voice. 'Exit' implies that the customer stops buying from the firm. 'Voice' is the customer's complaint that expresses the dissatisfaction directly to the firm [6,7]. According to these theories marketing pursues two key strategies for successful complaint management. On the one hand the rate of "voice" customers is raised by stimulating the customer to communicate his dissatisfaction. On the other hand, the focus lies on the quickest possible reestablishment of customer satisfaction, in order to avoid negative word-of-mouth or a business relationship breakdown. Complaint management is traditionally seen as a defensive marketing strategy, which enables companies to retain dissatisfied customers. In light of saturated markets, where the costs to acquire new customers are relatively high, this is to be seen a sensible approach [6].

Recent models describing the elements of complaint management follow the mentioned theories. Hence, the emphasis is on the development of structures from the customer relationship point of

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view, which are the complaint stimulation, acceptance of complaints and the complaint reaction.

While marketing research dealt with complaint management intensively, quality management generally neglected the importance of this research field. However, its relevance for quality improvements is known, and complaint management is part of the ISO 9001 standard as well as the EFQM Excellence Model [9,10].

The best known method to handle technical complaints in practice is the 8D method, which has been developed by the automobile industry and is an international established standard throughout the industry. The systematic approach has gained popularity in other sectors too. The 8D method contains an 8-step procedure for the handling of technical complaints and serves as a documentation of taken countermeasures for the complainant [11]. Nevertheless, it is not a substitute for an integrated complaint management process. It builds a framework for complaint handling, but lacks detailed hints how to organize a complex root cause analysis capable of dealing with rejections of responsibilities, the generation of holistic failure patterns or the consequent use of complaint information for corrective actions within the company [12]. Systematic quality oriented approaches to the design of technical complaint management are missing.

3. Complaint management and quality control

In quality management research, quality control loops are used to describe and measure the impact of adjusting actions to processes. Quality control loops can be established from the operative up to the management and planning level of a company [3]. Mostly they are applied on the machine and production process level [1,13]. On these technical levels, control actions can be determined by measuring physical outputs and comparing them with the set value. On the entrepreneurial level quantifiable values are rare. Due to this fact, entrepreneurial quality control loops are difficult to design with regard to robustness and stability of the related system or process. In addition, the evaluation of the control loop's positive impact on critical success factors is hardly quantifiable [14].

In line with the definition of technical control loops, quality control loops comprise three core elements: sensor, controller and actuator. The sensor detects the actual state of the controlled system by measuring its output. Deviations from the set value are reported to the controller. The controller is capable of the deeper analysis of the problem and the assignation of an actuator, who is responsible for the implementation of appropriate measures to the controlled system [15].

Transferring the quality control systematic to technical complaint management, the customer can be seen as the relevant sensor. In case he experiences a significant gap between his expectations and the characteristics of the delivered product, he voices his dissatisfaction by complaining to the producer. Complaint management represents the controller as it analyses the complaint information and chooses a measure to be introduced to the controlled process by the actuator.

Taking into consideration the length of the controlled process for such a control loop, its complexity is recognizable. Measures can be introduced from product development to production, which can lead to long system dead times until measures are effective [16]. Additional complexity is added by the sensor, not being part of the company, thus, being not directly adjustable. The behavior of the customer (sensor) can only be influenced by indirect activities, i.e. stimulation of complaints.

4. Reference model for technical complaint management

In order to build a basis for the discussion of the topic from a quality management perspective a generic reference model for technical complaint management has been designed [17]. The model comprehends requirements for the internal organization of technical complaint management in a process model. Its scope reaches from the reception of a complaint to the long-term use of complaint information in new product development. Embedding this model into the lifecycle oriented Aachen Quality Management Model underlines its control-character for product quality (see Fig. 1) [3,18].

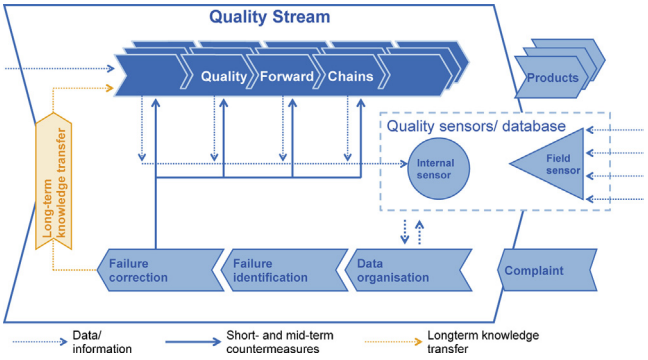

Fig. 1. Technical complaint management within the Aachen Quality Management Model.

The process model is subdivided into four steps, whereof the first three form the core of the complaint handling. The content of each phase is briefly described in the following.

4.1. Data organization

The data organization phase is critical to the quality of the whole complaint management process, since it sets the informational basis for failure identification and root cause analyses. Its main work steps are the complaint reception, the gathering and handling of data and the consolidation of data. The intention of the data organization phase should be the collection and consolidation of relevant data to support successor process steps. Sources for data are the complainant himself, but also internal quality and construction data as well as additional field data.

4.2. Failure identification

The failure identification phase starts with the pre-analysis of the failure data and its consolidation to a standardized failure pattern. Failure patterns help the company to reduce redundant work. Combined with a failure database, it allows the complaint management to check, if the actual complaint is a known problem, which is already worked on. In case of the problem being unknown, it is assessed for its priority. Especially for companies with large numbers of complaints, prioritization helps to allocate resources to the most important problems first. After failures have been prioritized, the failure correction is triggered by assigning a responsible person.

4.3. Failure correction

The first step of the failure correction phase is the identification of the root cause of the failure. Depending on the failure type and situation different quality management methods can be applied, in order to accomplish a systematic and efficient root cause analysis [12]. Once the failure cause has been determined, measures for the prevention of the failure need to be defined. In order to choose the most effective measure, potential measures need to be evaluated prior to their implementation. Usually the complaint handling process ends with the implementation of an appropriate countermeasure.

4.4. Long-term knowledge transfer

Many companies struggle transferring the results from failure corrections to parallel product lines, future product developments