

# VALUE CHAIN ANALYSIS IN QUALITY MANAGEMENT CONTEXT

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**Abstract:** *Based on the description of value chain analysis, which is a strategic management tool attributed to Michel Porter, the paper aims to demonstrate that quality management applies this method, under specific forms. The paper's specific objectives are: to redefine the functions of value chain analysis in the context of quality management; to clarify the significance and the possibilities of measuring the value added; to present management tools and techniques needed to control and systematically improve performance. Research methodology is based on examples, previous studies and a case study that reveals the diversity of indicators for measuring the value added and analysis tools used in quality management.*

**Key words:** *value added, quality management, value chain analysis.*

## 1. Introduction

"Value chain analysis" is a systematic method to study key competences and activities of the organization that determine competitive advantage. The concept was introduced by Michael Porter in his book "Competitive Advantage: Creating and Sustaining Superior Performance". Value chain, conceptualized by Porter, is "a system of interdependent activities, which are connected by linkages" [9]. Value chain analysis enables companies to identify those areas of business that create value, namely those that do not create value. To know these aspects is essential in a competitive environment: to be a source of competitive advantage, the company must perform an activity better than competitors or to perform an activity that creates value which competitors cannot perform.

In the last decades new concepts and approaches about the value chain have emerged: "global value system" and "value

system" are expressions used to describe an approach extended beyond the borders of the organization. According to Gereffi [4], "global value chain" refers to the logistics and production involving strategic decisions and the creation of international networks, aiming to develop an industry-centric view of economic globalization that highlights the linkages between economic actors and across geographic space. Researches on "global value chain" examine the different ways in which global production and distribution systems are integrated and the possibilities for firms to enhance their competitive position.

Regardless of whether is limited to internal activities of an organization or includes links to other companies, value chain analysis is used as a strategic management tool that allows understanding the strengths and weaknesses of the systems that are studied, and identify new ways of conducting activities in order to generate value added.

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Assuming that quality-oriented organizations act systematically to improve processes that generate value added, the paper aims to present specific methods for applying value chain analysis in quality management. The paper's specific objectives are: 1) to define / redefine the functions of value chain analysis in the context of quality management; 2) to identify and classify relevant indicators for measuring the value added; 3) to present management tools and techniques needed to control of value added.

The methodology of the study consists on an analysis of the mechanisms of improvement and the indicators for measuring the value added at process level and organization level, in the context of quality management. This paper presents various examples and a case study that reveals the diversity of indicators and tools for measuring and analyzing the value added and the need to adapt them to the organization's particularities. The research is also based on previous studies of value-oriented management and value chain analysis.

The novelty of this paper is represented by the description of the relationship between quality management and the value chain analysis. The study creates a framework for extending the use of value-based approaches to quality management, both in assessing strategic initiatives to improve quality and to improve the organization's current activities.

## 2. Value chain and process based approach

The value chain concept was developed by Michael E. Porter in 1985. It is a management concept which describes a company as a conglomerate of tasks, divided into primary tasks and supportive tasks. Figure 1 shows the general model of activity flow on which rely the value carried out by an organization, by its products and services. The purpose of this approach is the analysis and improvement of the organization performance, given the value added of the value chain activities, in comparison to the competition.

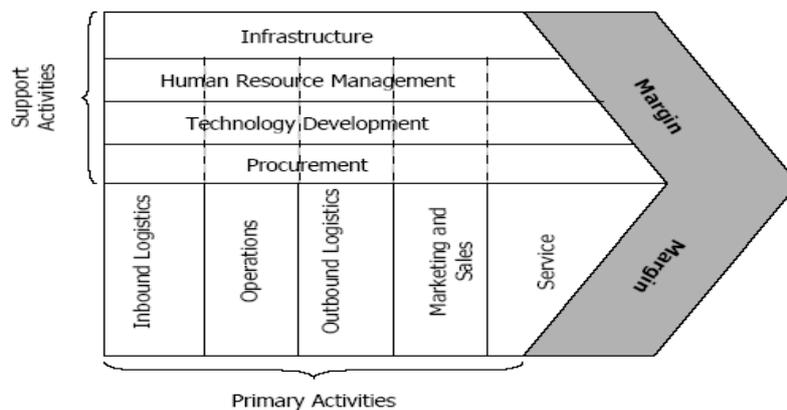


Fig. 1. Value chain (Porter, 1985)

The organization's process based approach, also elaborated in the '90s, has become one of modern management principles. The meaning of the concept of process is "a set of activities designed to deliver value to an internal or external

client" [1]. Process based approach involves creating the organization's vision of process, which means focusing on the set of processes designed to produce a specific output for a particular customer or market.

Process based approach underlies new

models of improving the performance of organizations, best known as Quality Management Systems - ISO 9001. ISO 9000 standards on quality management systems (QMS), starting with the 2000 edition, promotes the approach of organization in terms of process, which is a way of looking at the overall activity of the organization and to identify key areas on which depends the achievement of quality.

Identification of processes in an organization and their management allows: 1) a better understanding of customer requirements; 2) the control and improvement of process performance; 3) harmonization of all processes with the strategy of the organization [15]. These three advantages are illustrated by the scheme in Fig. 2, where arrows are processes performed by the organization.

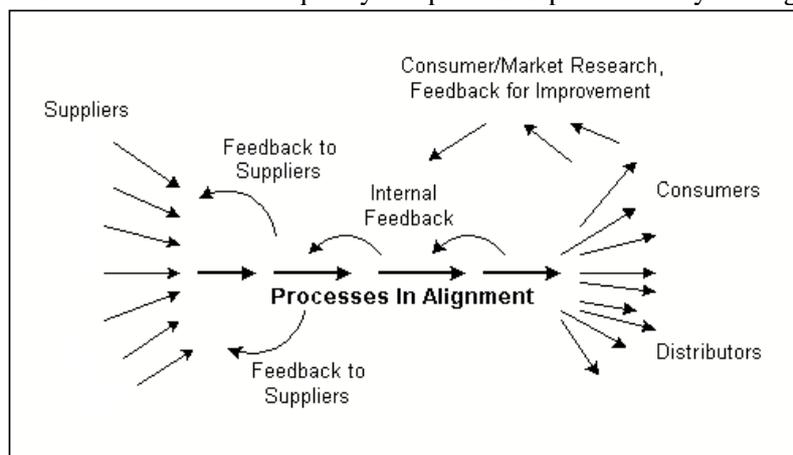


Fig. 2. View of the organization processes (adapted from Deming, 1986)

Process based approach creates the framework for analyzing and continuous improve the organization performance through systematic actions on the processes from the value chain. Within each organization, defining the processes and their performance must be made from a strategic perspective, taking into account the effects on the overall performance of the organization. Performance levels of the process depend on how the work is done, methods and resources used: these may be the organization's competitive advantage, or weaknesses, as appropriate. Increases in performance can be achieved in various ways; taking into account the actions' amplitude, there can be delimited two main categories: radical changes (process innovation), and small-scale changes (step by step improvement). Because of their different objectives, on separates the value-based approaches into techniques for (a)

planning and evaluating new strategic initiatives and (b) analyzing and improving current operations [12].

This paper treats the use of value chain analysis in the context of quality management. The distinctive element of quality management in the organization is to create tools through which are carried out continuous and systematic analysis and improvement of the value chain processes. The emphasis is on process parameters control and elimination of their deviations/variability by corrective actions. These actions for improving current activities do not exclude the transition to new levels of performance, through innovation, corresponding to the new context and the strategy adopted by the organization. In the literature, innovation is treated as a distinct field [10], complementary to quality management, but practically they are not always clearly delimited.

The case study developed in the paper shows that quality management mechanisms and specific tools make possible the improvement of current activities - through action-oriented to nonconformities/ deviations from specifications and move to new levels of

performance required by the harmonization of quality strategy objectives adopted by the organization. These actions correspond to levels 1 and 2 of the hierarchy of actions to improve processes by the complexity and domain of approach (Figure 3).

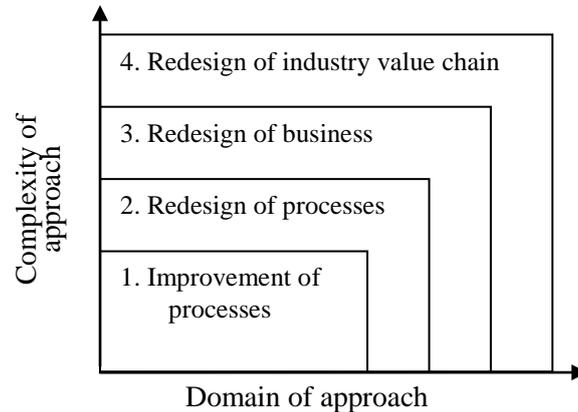


Fig. 3. *Levels of the processes improvements*

In conclusion, it can be said that quality management integrates value chain analysis in specific forms. The following paragraphs present two of the key elements essential to conduct and finalize improvement processes: measuring the value added by improving the value chain processes, performance indicators; specific management methods and tools for controlling and improvement of value added.

### 3. Measuring value added by improving the value chain processes

The terms "value" and "value added" have been used over time in various ways, and they have different meanings today.

According to the theory of value developed by classical economists [3], [6], "value" means the benefits a (potential) user will gain from a product or service, measured, for example, by the maximum price he or she may be willing to pay. At the same time, „value added” is the amount by which the earnings exceed or fall short of the total amount of capital that was invested,

serving to measure economic performance of a project, operation or corporation.

These traditional theories of value are insufficient today to provide performance measurement and to guide organizations. The modern management considers that a business is more than finance and supposes considering the stakeholders needs and incorporating them into the organization strategy and sustainable value creation activities [5], [7]. The meaning given by modern management to the concept of value is broader, and it refers to the organization contributions on customer satisfaction and other stakeholders (customers, employees, external environment, employers, etc.). In this respect, the value added is measured by systems of indicators on financial performance, performance and motivation of employees, increase of market share and customer satisfaction, improve of environmental performance and social responsibility, etc.

Defining and measuring value added has an important place in quality management, which involves quality planning,

controlling and continuous improvement. The system of indicators used is structured on several levels, and is essential to define performance at the organization's level and at the value chain process level.

Studies on the measurement of value added emphasize the diversity of indicators that can be used and the need to adapt them at the particularities of the organization, for directing and monitoring the performance in any organization [11]. As shown in the analysis conducted, financial measurements continue to dominate business process evaluation in all sectors, but the non-financial indicators are important too, relates to the stakeholders needs and mechanisms used by managers to facilitate value creation. In a study on improving the supply process [13], the authors consider that the added value is expressed as: better contracts, increased efficiency of supply, customer satisfaction (services and better quality), collaboration and closer relationships with suppliers, cost reduction, improving the quality and increasing the time on market by involving the purchasing department in the process of developing new products.

Summarizing the above comment, in quality management the measurement of value added is done: at the organization's level and at the process' level, by financial indicators and non-financial ones. Another classification of performance indicators differentiates: indicators that measure the effectiveness and indicators that measure efficiency of processes/organization [14]. Effectiveness is "achieving objectives" and efficiency measures "the level of resources used to achieve the objectives". In the first category belong: increased customer satisfaction and reduction of the weight of non-conformities, and in the category of efficiency indicators may be included: work productivity, consumption of material resources, the assets, costs, etc. Efficiency and effectiveness are applicable to all organisational processes, but the

indicators to measure the performance does not fall within templates, the above examples are only illustrative.

Choosing the indicators and setting permitted levels and their deviations are key issues in designing the QMS. Solving these problems depends primarily on the business particularities, and involves the creation of tools and techniques for measuring and analyzing the indicators. The next example illustrates the interrelations between the performance indicators of the processes from the value chain and how systematic control and improvement actions specific to quality management contribute to increasing the value added.

#### **4. Tools and techniques for monitoring and analyzing the added value, case study**

The case study refers to a small business that trades a diverse range of products such as adhesive tapes and foils, intended mainly for business customers. The economic results of the company are positive, and characterised mainly by the profit margin. In terms specific to the value chain analysis, profit margin measures the economic value achieved by the company.

The processes on which depends business performance have been defined during the implementation of quality management within the company. Value chain includes: basic processes (clients relationship, supply and product delivery), support processes (related to human resources, infrastructure, and information management) and management processes. Each process has specific functions and is managed by rules established to achieve the objectives.

Process defining includes setting of indicators that serve to assess the process performance. Diagram shown in Figure 4 illustrates the basic processes, the main quality characteristics and their performance indicators, specific to quality management. At the entire business process level, effectiveness is given by the

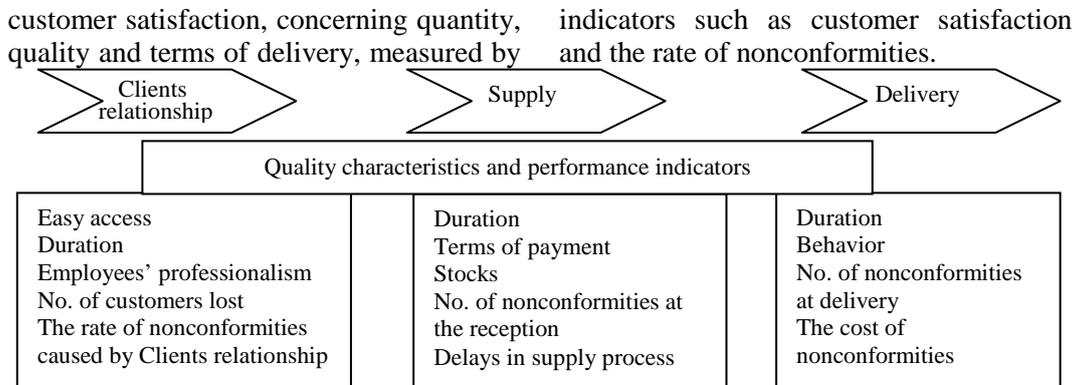


Fig. 4. *Basic processes, performance indicators*

Achieving quality management within the organization requires, on one hand, to determine the optimal level of quality characteristics and on the other hand, to develop tools for monitoring and analyzing performance, for signalling and eliminate deficiencies. These two issues will be discussed separately with reference to the basic processes of the value chain.

Establishing the optimal levels of indicators falls into the category of strategic actions of analyzing and improving the value added. From the perspective of quality management, the main indicators characterizing the effectiveness of customer service processes are: the process of order fulfilment, flexible adaptation at the requirements on the quantity and variety of products, the rate of nonconformities.

The duration of solving an order is an important performance indicator, reducing the duration being an important competitive advantage in the current context. At the company that has been analyzed, the average delivery times are two days and 10 days: the minimum duration is specific to delivery directly from stock, in the second case (the most common situation) goods are being purchased based on the customer order.

The values are being set differently, by categories of products and suppliers. In the case of a stable relation with major

customers, delivery will be made within the time limits established by contract/order. In the specific language of quality management, delivery delays and other deviations from the contractual requirements (regarding quantity and quality of products delivered) are being considered as nonconformities. The rate of nonconformities is an important indicator for measuring the organization performance: in the case of companies oriented toward excellence the rate of nonconformities is low, the target can be 0 nonconformities.

Establishing mobilizing levels of objectives related to quality is part of quality strategic planning [8] and it depends on several factors such as business strategy, the process particularities, and quality management system maturity. The main management tools used in the company that influence the quality of processes from the basic chain are presented in Table 1. Sizing stocks is one of the key aspects on which depend the duration of solving orders, but also the storage costs and capital assets. Especially for important customers, launching the supply order must be made so as to avoid exceeding the contractual terms, which often involve building stocks. Decisions are not taken globally, but by categories of products and customers, being a lot of factors that must be considered: the

variability of orders, the average time of supply, and the operational risks. The size of normative stock is one of the company performance indicators, modelling and simulation methods can be used to optimize this parameter. Controlling of performance indicators is the second way specific to quality management to improve

performance. Quality management systems include tools for monitoring and reporting deviations from the activities objectives set. In this example, monitoring concerns the following: the sales and earnings levels, stock levels, the compliance with delivery deadlines and other contractual requirements, etc.

*Planning and optimization tools of the delivery process duration*

Table 1

Factors of influence	Solutions	Tools
1. Capability of suppliers	Analysis of suppliers' capability to respond quickly to requests. Assessment should be done periodically, based on statistical data on previous orders.	The grid for suppliers' evaluation and selection; Database concerning suppliers
2. Communication between the functions involved in Clients relationship, Supply, Delivery	Definition of terms / contractual requirements with the participation of representatives of involved structures;	The procedure for defining requirements; Integrated inventory management system;
3. Stock size	Analysis and optimization of stocks of goods	Analysis of stock rotation; ABC method, etc.

The main tools of QMS implemented for this purpose are the nonconformity reports and databases: recording in the nonconformity reports of any deviations and the statistical analysis of data provides information on the number of nonconformities and causes of deviations. Solving the problems is done by actions to eliminate the causes that generated deviations (corrective actions); as required by ISO 9001, there should be identified also any potential problems, for which will be set preventive actions. Depending on the way of organizing the activity, the task of tracking the deviations can be delegated to the salesman or sales agent, being important their accountability and involvement in solving problems.

Monitoring and quality improvement by corrective and preventive actions are components of QMS, which according to specialized studies generate significant competitive advantages. The effects associated to corrective/preventive actions can be immediate; for example, giving up suppliers with a high rate of

nonconformities, staff training, expanding the delegation of tasks. Quality monitoring also provides useful information for making greater changes necessary to achieve strategic objectives; for example, modernization of the transport fleet, implementation of management by objectives, etc.

It is important to note that all these results depend on the QMS tools created, by organization, but also on how the system works; a system that is malfunctioning is the cause for losing any important opportunities to improve value added.

## 5. Conclusions

All economic activity, whether in the public or private sector, ultimately revolves around the process of creating value. Implementation of quality management in organizations creates the framework to act systematically and continuously to increase the value added by improving performance of the organization and its processes. Improvement is based on radical changes or

step by step improvements and has as premise the process based approach.

In this context, the essence of the value added analysis is about planning, monitoring and continuously improvement of the quality of the processes from the value chain. Value added is expressed by relevant performance indicators, financial and non-financial, agreed upon both at process level and organization level.

Establishing quality objectives is associated with strategic management and implies value chain analysis to identify changes that can bring competitive advantage. Throughout the organization's operation, performance monitoring and analysis are done, taking operative actions when deviations are detected to prevent their recurrence.

As shown by theory and practice of quality management, the cumulative effects of these improvement actions are considerable. Another major advantage is that these improvements are specific to the company, this means that they are a result of the unique way of combining resources and skills available, making it difficult for competitors to recognize, to understand and imitate.

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