



QUALITY AND INNOVATION AS A SOURCE OF SUSTAINABILITY IN CONSTRUCTION

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Abstract

Analyzing the importance of the quality of construction services, the work highlights the key factors of integrating quality management and innovation. In the conditions of increasing competition on the construction market, "survival" and the evolution of this market is possible only when there are efforts, including financial ones, sufficient to create high quality services that can fully satisfy the customer's needs and loyalty them. Quality is not just an element of differentiation in terms of competitiveness, but also a way to change the price with which the service enters the market.

In order to meet the requirements of the client, in the context of strong competition construction companies must implement a management system that combines both quality and innovation. Innovation is achieved through rapid change that generates radical improvements to the initial situation. Quality management is an important tool that can not, however, create values at infinity unless it is doubled by innovative and avant-garde strategies

Keywords: innovation, quality, innovation management, quality management, integration, quality in construction

Introduction

A large number of companies are in an accelerated process of organizational and managerial transformations, redefining the place and the role they have on the market. In the face of growing competition, business survival and development is only possible when sufficient efforts are made, including financially, to deliver products and services that fully satisfy customers, which would allow them to increase their turnover business and profit. In this context, customer satisfaction must become a fundamental strategic objective for each firm (Dobran, 2008).

The emergence of an increasing interest in innovation and quality issues at national, regional and international level required integration of innovation and quality management as a mandatory component of the company's overall management.

If the focus was on productivity in the 1980s, with quality being second and innovation only at some points over the past twenty years, firms have been focused on quality management through processes and systems (Figure 1). This has helped to achieve competitive positioning through the concept of continuous improvement. In the 1990s, global market competition prompted companies to consider quality as a key driving force, without omitting productivity in the competitiveness equation. In 2000, a change of priorities emerged and companies realized that

innovation is as important as quality to provide them with a competitive edge in the market (Brad, 2006; Maier, 2012), this approach being of the utmost importance in present.

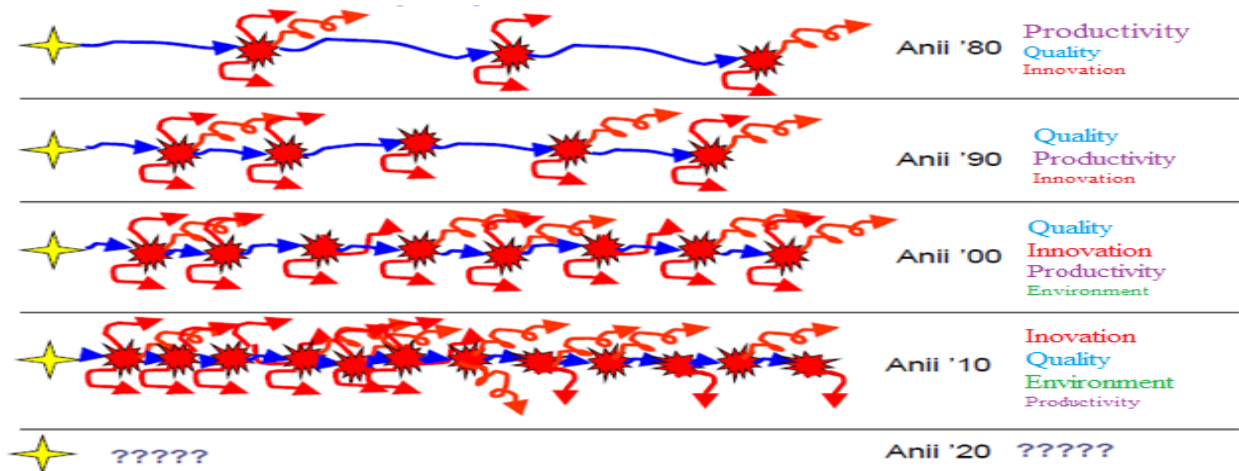


Figure 1 - *Innovation and quality from the perspective of the economic environment evolution* (Brad, 2006; Maier, 2012)

At the same time, innovation is not easy. Innovation efforts over time have provided a myriad of failed innovation projects. Even large companies, who were precursors and creators of all markets, have failed to remain competitive when the main changes, especially technological, have taken place (Prahalad, 1994; Vachhrajani, 2008). Organizations are accustomed to what they do (basic skills) remain stuck there, and when the environment changes (eg Changing customer requirements, changing regulations) is incapable of adapting easily and quickly (Vachhrajani, 2008, Tushman, 2002). This new approach to integrating innovation and quality involves addressing R & D activities in connection with the business environment and other societal structures that need to apply new solutions, with the goal of gaining benefits for organizations, society, people.

Challenges for innovation and quality management

Innovation is a dominant factor in maintaining global competitiveness, it provides a mechanism for a company to grow faster, better and smarter than its competitors and to allow it to influence its direction (Lin, 2010; Maier, 2014; Oster, 2010). From the point of view of managers, the main purpose of innovation is to introduce change into the organization to create new opportunities or to exploit the existing ones (West, 1996; Wicks, 2004; Wu, 2008; Sisaye, 2010).

Three criteria are important for understanding the notion of innovation management (Popescu, 2016):

- ↗ the formation and initiation / imposition of the will of the leaders in relation to the processes of change, renewal;
- ↗ initiating systematic, innovative stages aimed at an objective;
- ↗ correlating innovations in a strategic organization system.

Innovation management is a complex task of leadership, which through its strategic and operative elements leads to a systematic process of change.

Quality is the set of properties of a product or service that gives it the ability to meet the expressed or implied needs. Quality is not expressed by a single characteristic but by a set of characteristics; is not a single concept, it is defined only in relation to customer needs and is a continuous type variable.

The Japanese Industrial Standard JIS 78101: 1981 defines quality as "the totality of the characteristics or performance of a good / service, which determines its ability to correspond, to fit the intended purpose of the customer with the intention of using the customer." Quality does not mean the best asset / service in the absolute sense, but the best / service under the conditions imposed by the client, conditions stemming from the way of use and the selling price" (Ilieş, 2003).

Because of the quality we attract customers, which is the purpose of each organization. How do we improve customer satisfaction? By offering him exactly what we promised, no matter what this promise relates to, respectively, the performance of the products / services provided, execution / delivery times, costs, and last but not least by building a customer relationship, so nothing else but *quality*.

Non-quality consists of doing one thing two or more times, leading to a waste of time and money both for customers and for the organization, involves a higher cost than preventing mistakes and "doing everything right first time "and, last but not least, involves the risk of losing the customer. The cost of retaining a customer (loyalty) is five times lower than the cost of attracting a new customer. So non-quality ultimately costs much more than quality (Dobran, 2008).

Quality management is the set of activities of the overall management function that determines the quality policy, objectives and responsibilities within the quality system. The management has direct subordinate the following means, sub-functions: quality planning; quality assurance; improving quality; quality control (Ilies, 2003).

Integrated Model of Quality and Innovation

An effective management model is the approach to integrating innovation and quality concepts (Maier, 2014) into a link between quality management and innovation management (Figure 2).

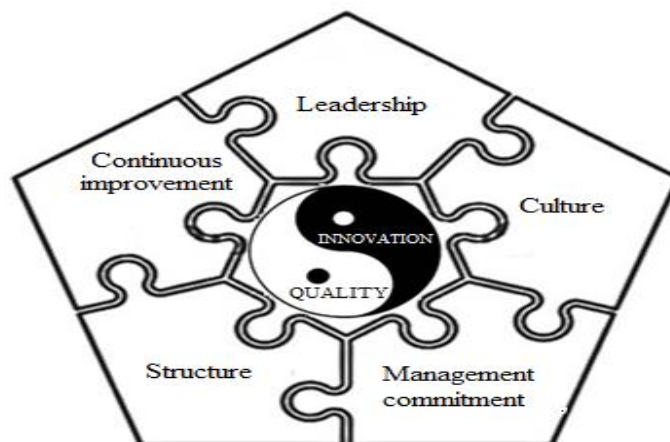


Figure 2. **Integrate framework for quality and innovation**

This model highlights the idea of balancing the organization's dynamic capacity between exploitation (quality) and exploration (innovation) (Figure 2). This approach uses the principles of innovation and quality to create an integrated framework. Five imperatives determine the success of quality and innovation in an organization, as outlined in Figure 2, namely:

1. *Leadership*: the organization must make every effort to be successful, it requires dedicated leadership to the commitment to meet customers with the utmost attention to quality and the promotion of innovation
2. *Structure*: the organization must be structured in a way that promotes staff involvement and must consider providers as an integral part of the organization. The structure must be provided with innovation and quality in the bottom-up organization, and there must be a strong involvement of staff, providing them with adequate support for innovation and generating quality.
3. *Organizational culture* must be customer-oriented. The way customer and customer requirements, needs, expectations, preferences, customer preferences are built are the key factors that lead to client attraction, satisfaction, loyalty and retention. The client should remain at the heart of all the organization's activities, and customer satisfaction should be the primary focus of the organization (Ko, 2010).
4. *Continuous improvement* is the key to innovation in any organization. The implementation of continuous improvement assumes that innovation is part of the organizational culture and is a systematic and coherent process.
5. *Management commitment* is an absolute condition for the success of both quality and innovation. Management should have a quality and innovation policy in which its assumption should be documented and communicated to all involved in the organization.

The Yin-Yang concept presented in Figure 2 is a metaphor of two integrated concepts within a company. Here, Yang (male) represents the quality and the current ability of an organization to offer value to existing products and services. Yin (feminine) represents the innovation and the ability to create new value. This distinction is important because it allows a more nuanced analysis of the potential of a company to generate value for stakeholders (Maier, 2014).

The puzzle illustration emphasizes that innovation and quality together form a whole and bring many benefits to companies. The basic idea is that the absence of 'parts' imbalances effective productivity.

In today's business sectors, emphasis on quality as a competitive tool is complemented by an emphasis on innovation, quality being necessary but insufficient. For managers, the question arises: what should we focus on: quality or innovation? When looking at quality as a criterion to resist the market, managers need to learn how to manage quality and innovation at the same time. Quality focuses on stability and efficiency, and focuses on satisfying existing customers, while innovation requires flexibility and efficiency and is often focused on attracting new customers (Maier, 2014).

Quality management in construction

Building activity is recognized as one of the oldest human concerns and materializes in built environments in which the whole system of human activities and concerns (productive, social, cultural, etc.) is carried out. The built environment influences all the material and spiritual activities, which has led, since antiquity, to the guarantee of the quality of the construction production (***, 2018).

Quality is an extremely important subject in the field of construction. To emphasize the importance of quality in construction, there was a need for a legislative framework that would regulate all aspects of quality. In Romania these requirements are presented within Law 10/1995 on Quality in Construction. By means of this legislation, quality has been defined in construction, basic quality requirements have been identified and a system of quality in construction has been established so that each party involved in the field is aware of its duties and obligations.

Project quality management includes the processes necessary to ensure that the project meets the needs for which it has been undertaken. Project quality management includes both process (project management) and product (construction objective), as failure to meet performance requirements in both areas can have negative consequences for all stakeholders. Each project is influenced by specific requirements regarding quality, cost and duration of execution. The trends for these three parameters are shown in Figure 3:

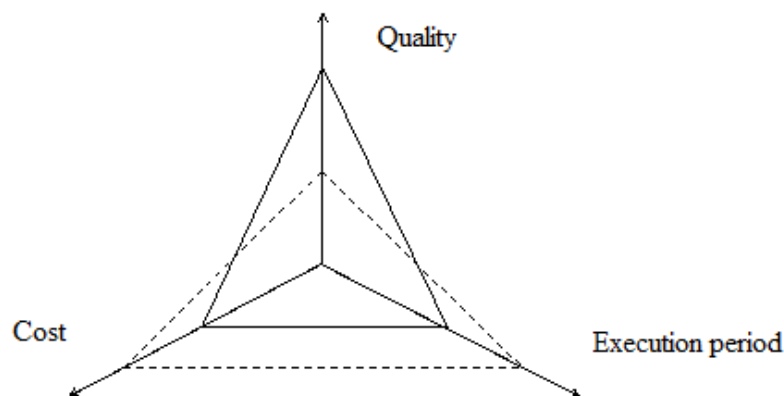


Figure 3. **Triangle cost-quality-duration**

Obviously, the concurrent satisfaction of these three requirements (reducing costs and running time in parallel with increasing quality) is difficult to achieve because it is only possible in the case of spectacular technical or organizational changes. The project manager has the role of ensuring (in the continuation of the designing activity) the achievement of the required quality in terms of acceptable costs and time.

Innovation in construction

Innovation is an important and defining element for the development of an organization that operates in a constantly changing competitive environment. People's needs have changed rapidly lately, and for adapting the organization to these changes and maintaining a strong competitive

advantage over competing firms, innovation can be an effective strategy for doing so (Popescu, 2016).

Innovation as a process ensures:

- ⇒ reduction of production costs;
- ⇒ the company's sustainability;
- ⇒ adapting products to customer requirements;
- ⇒ creating new, better performing technologies;
- ⇒ improving the performance of the manufacturing process;
- ⇒ changing the nature of products and, implicitly, their performance to enable the enterprise to meet a higher consumption demand;
- ⇒ reducing product lifetime by using innovative technologies;
- ⇒ reducing product delivery times by using innovative technologies;

The main factors leading to the reduction of innovation activity at a company level are:

- ✓ lack of access to finance;
- ✓ lack of creative and innovative staff;
- ✓ lack of management skills, including innovation management;
- ✓ lack of knowledge about the benefits of innovation;
- ✓ lack of access to knowledge;
- ✓ lack of knowledge about support instruments;
- ✓ lack of facilities to stimulate cooperation between actors;
- ✓ lack of access to the database and clusters;
- ✓ difficulties in identifying partners for innovation;
- ✓ lack of protection of innovation;
- ✓ the high costs of innovation;
- ✓ Management's postponement of the risks induced by change;
- ✓ uncertainties about the evolution of raw materials and demand for the new product;
- ✓ Difficulties arising from the transition from the design phase to the deployment phase.

Conclusions

In a competitive, changing environment, innovation and quality are key points for the development and survival of organizations in every field. Over time, organizations have learned to master the production process to such an extent that they no longer function as a significant competitive advantage. The new challenge is to master the innovation process - capitalizing on change, creating new competitive advantages by offering better products, using better processes, offering better services or even offering completely new solutions. However, we have not yet learned to master the innovation process. In fact, there is often only a rudimentary understanding of what is needed to master innovation - and what innovation really is. For individual firms and society in general, the ability to innovate and quality assurance is vital to ensure growth and competitiveness in the coming decades.

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