

## Innovation of Quality Management in Engineering Projects

Dr. Sc. Esat Gashi<sup>1</sup> and Dr. Davorin Kralj<sup>2</sup>

<sup>1</sup> Civil Engineering Faculty, University of Prishtina, Kosovo.

<sup>2</sup> Associate professor, Institute for Creative Management Maribor, Slovenia.

Orcid: 0000-0003-3579-478x

### Abstract:

The world is today facing unique crises challenges. The idea that business has a responsibility other than producing goods and services is not new. Corporate responsibility now extends to encompass not only the needs of employees, but also the quality and society as a whole. As industry grows in strength and importance, it is also being called upon to share the benefits of its growth with members of society. Leaders of successful, high-growth companies understand that innovation and quality are what drives growth, and innovation is achieved by awesome people with a shared relentless growth attitude and shared passion for crisis problem solving and for turning ideas into realities. Engineering Companies like other Companies and Corporates are facing challenges in business improve. Engineering Corporates in 20<sup>th</sup> Century are worldwide located and as a Corporate Managements is striving for excellence in each project and office. To succeed in this challenge is only one way and that is keeping innovation in quality management all the time as a top priority for the entire organization from Top Management up to the front desk employee.

**Key Words:** Business, Change of organization, Innovation, Organization, Quality

### INTRODUCTION

The successful development and implementation of system thinking and processes innovation in an organizational system can produce a significant saving in the amount of business and environment resources and therefore a smaller environmental impact. For this reason the care for processes innovation, the change of relation to the environment also the consequence of knowledge about the meaning of co dependence and creative collaboration to achieve the safe, quality and environment friendly operation. In Construction Industry like in any other branch, quality is so the consequence of innovation's administration and processes in sense of consideration of dialectic system of viewpoint.

Characteristic for these most developed is the effectiveness and successfulness, that basis on the price, quality, uniqueness and choice of tendered. It is about the enforcement with the knowledge, creativeness, culture, where in its broadest meaning belongs also the permanent quality. The ability of compe-

tion with the world competitiveness also means the ability of competitiveness in the permanent quality development. It is possible to preserve the competitive advantage especially with the totality between the planning, administration, control and comprehension of Company operation content. The permanent quality development is not only the problem of technology, civil engineering, economy, and so on, but mainly and first of all of our values and behaviour, that claims different point of view and inter-structural viewpoint. We need "the common viewpoint". The care for the engineering projects means also the care for environment and permanent quality development and it is the task of management. For this reason the care for engineering projects and permanent quality development is the component part of responsibility and obligations of management in all levels of organizations or corporates. The classical operation, limited on the expectation of competitive success in the mass production is exceeded with innovative operation that achieve the competitive position with different point of view, inter-structural collaboration. To achieve this, it is necessary to influence on the starting point of most influential people in administration and content of administration-deciding. "That's why with system and systematic research and innovation of relationship between the people in the enterprise, who has for consequence also the product or service, it appears with them equivalently the system and systematical innovation of starting point for the individual (professional) deciding, that has for the consequence the knowledge examination, communication and professional label or (entrepreneur's) culture [3]. We need to change our habits and accept the quality as an obligatory part of our decisions and actions.

### ORGANIZATIONAL CULTURE REPRESENTS AN IDEOLOGY OF THE ORGANIZATION

Organizational culture represents an ideology of the organization as well as the forms of its manifestation. The ideology of the organization includes beliefs, values and norms. It is manifested through symbols, language, narration and other activities. Organizational culture is the set of shared philosophies, assumptions, values, expectations, attitudes and norms which bind an organization together. It helps a company to implement its strategies effectively (ISO 14001:2004(E), 2004). Organizational culture has been defined as patterns of shared values and beliefs over time which produces behavioral norms

that are adopted in solving problems (IWA 1:2005 (E), 2005). Schein (Shein,) has also noted that organizational culture is a body of solutions to problems which have worked consistently and are therefore taught to new members as the correct way to perceive, think about, and feel in relation to those problems. Cultures basically spring from three sources, [1] the beliefs, values, and assumptions on founders of organization; [2] the learning experiences of group members as their organization evolves; and (3) new beliefs, values, and assumptions brought in by new members and leaders (ISO 9001:2004(E),2004). In fact, these shared philosophies, assumptions, values, expectations, attitudes, and norms bind an organization together. Organizational culture can therefore be used as a form of control (Wilkins & Ouchi, 1983) and as a means of increasing productivity (Denison & Mishra, 1995).In sum, organizational

culture is glue that welds managers together for effective implementation of organizational strategies, and the absence of this glue would bring about disastrous effects on the organization.

A knowledge-era organization needs to cultivate opposing traits and embrace dualities. The effectiveness of organization learning depends on how knowledge management processes are aligned with an organization's infrastructure and processes, in a manner that supports the achievement of an organization's goals. That knowledge is of fundamental importance for organizations of any sized industry is no longer a question. Even if knowledge is not the sole element for an organization's survival, it is the most important one because it supports all others.

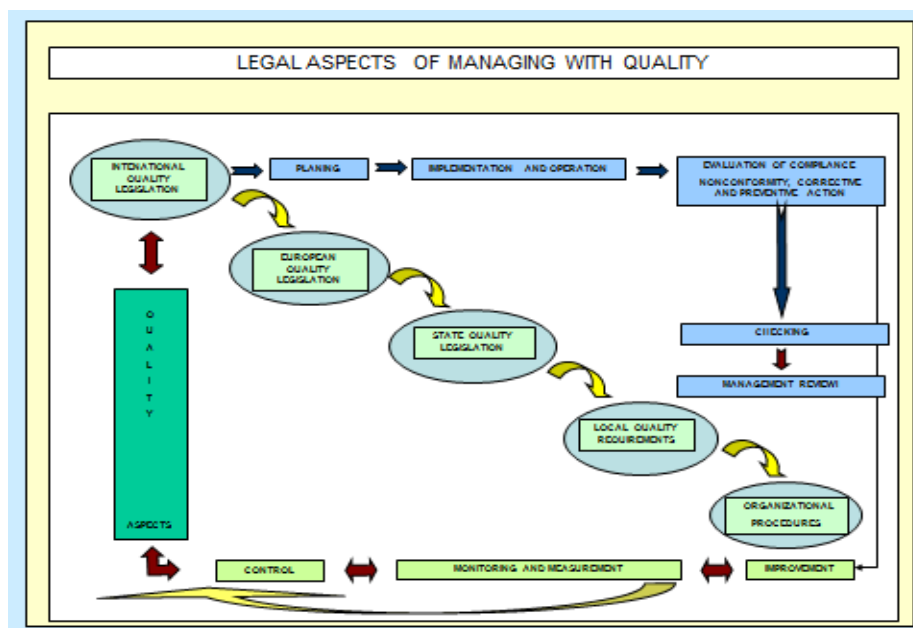


Figure 1: Legal aspects of managing with quality

### ORGANIZATIONAL APPROACH

Survey of literature shows that there has been a few research about innovation in production processes in construction enterprises worldwide. Everybody speaks of technological development only, although it is causing increasing unemployment around the world and other problems such as motivation and environmental degradation, including a dangerous climate change. There is also an unchallenged supposition that in transitional economies owners and managers are equally fond of continuous innovation as are the ones in the most advanced corporations of the world [16].

The term "innovation" is usually associated only with technology, in the strictest meaning of the word (new) products and new methods for making them. Nevertheless, innovation refers to the process of bringing any new, problem solving idea into use. Idea (as a step on their way to innovation) for

reorganizing, cutting costs, putting in new budgeting systems, improving communication, or assembling products in teams are all innovations, provided the new idea is useful in its user's judgement. Therefore, innovations in management methods and organizational practices constitute a wide range of opportunities for "corporate entrepreneurs" (Moss Kanter 1983: 20-21) as well as for other types of activating employees' ability and motivation (eg. 20 keys method, quality standards ISO 9001, environmental standards ISO 14001, social accountability standards-SA 8000, safety and health standards OHSAS 18001, TQM-total quality (as well as self-regulation and business excellence) management and other innovation management methods) [16].

In efforts for the improvement of position on the purchaser's market the companies must also consider accordance of operation with valid environment protected prescriptions in field

of process consumer. The inclusion of companies in the international market, the care for reputation, which the company's profit with the environment protection and permanent development, places the politics of environment protection to the base of the professional politics [7]. The environment protection and permanent development is so a basic component of the basic politics and it is confirmed by the highest administration agency. It is about the important decisions about the basic goals of operating and development. It is about the acceptance of basic principles values and rules. More than constraint of the state, the system is important, that is founded on the volunteer offer and creative cooperation. In the contemporary circumstances the creating of teams is getting most important for the creative cooperation, because they search the opportunities, solve the problems and in the end they take decisions.

The current position of an organization with regard to the quality can be established by means of an initial processes, innovative operations and management review. The innovative operation is operation that, according to the production and all other components is found on innovations.

The initial review can cover the following:

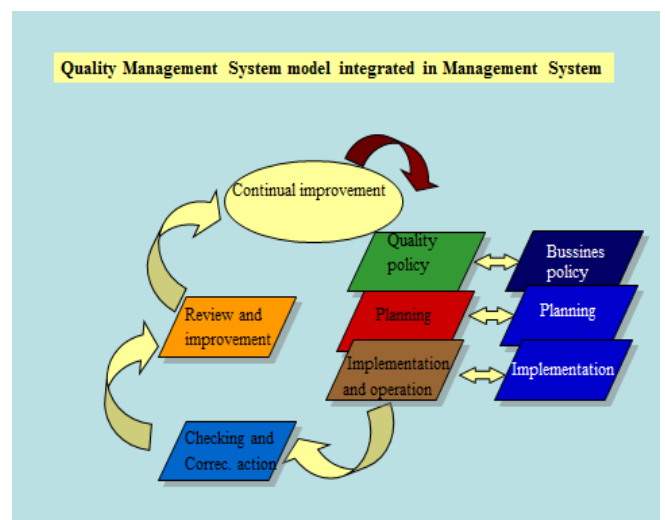
- identification of legislative and regulatory requirements;
- identification of processes, innovative operations;
- identification of environmental aspects of its activities, products or services so as to determine those that have or can have significant environmental impacts and liabilities;
- evaluation of performance compared with relevant internal criteria, external standards, regulations, codes of practice and sets of principles and guidelines;
- existing business, processes, innovations, environmental management practices and procedures;
- identification of the existing policies and procedures dealing with procurement and contracting activities;
- feedback from investigation of previous incidents of non-compliance;
- opportunities for competitive advantage;
- the views of interested parties;
- functions or activities of other organizational systems that can enable or impede environmental performance [15].

The process and results of the initial environmental review should be documented and opportunities for QMS development should be identified. Such a partial approach can lead to technically and economically inappropriate solutions. The new model which promotes production processes innovation

was derived from the model of managing company policy following the interest theory and business excellence. It was conceived in the frame and interdependence of both objective and subjective starting points of initial change agents as well as from process knowledge of process managers. New dimensions like business excellence, production processes innovation, companies' capacities and opportunities for continuous innovation, as well as values, knowledge, skills and feelings of change agents, will be added to the basic model [16].

Organizational systems or models need lean organization. Lean organization is first step of processes innovation and quality system. Possible measures, which the lean organization can encompass, include the fields of organizational measures, reconstruction of existing processes and products, the use of modern equipment and techniques as well as the introduction of new technologies. The dimensions of business excellence, especially production excellence, of production processes renovation, a company's or other organization's capacity to innovated as well as the values, knowledge, skills and feelings of production processes innovation agents, are added to the basic model [6]. The renovation of production processes results from lean organization, which is based on up-to-date technological and organizational starting points. Market needs new consumers. Consumers need new products and services. Only innovative lean flexible organization could be the answer. Lean organization is market-driven; a buyer's market and innovation society prevail and acts as change generators in a company or other organization [16].

Figure 2 presents an approach to quality management system integrated with other management requirements.



**Figure 2:** Quality management system integrated with other management requirements.

#### SUCCESS FACTORS FOR COMPANY RE-ENGINEERING

The organization of most companies is still structured according to the principle of function orientation. Based on that

principle, organizational units are responsible for a small number of activities which they perform for the overall spectrum of products and services in the company. Thus we may find departments for production, procurement, sales, accounting, etc. Traditionally, each of these departments has its own specialized information system with its own database. In such a function-oriented organization, a business process, e.g. the process from a customer order to the shipping of a finished product, crosses many departmental borders. This leads to inefficient, time-consuming, and expensive process execution, and it increases the number of errors. The paradigm of Company re-engineering therefore leads to a fundamental re-design of the organization and its information systems. Organizations are structured according to business processes rather than functions, i.e. one organizational unit is responsible only for a small number of products or services, but for all or most processes related to them (cf. Scheer 1994). Information systems need to be re-designed, as well. Isolated, function-oriented systems are to be replaced by integrated systems supporting the entire business processes. Centralized, main-frame-based systems cannot meet the demands of modern, process-oriented, decentralized organization. Such organizations require flexible solutions, such as client-server systems. In the construction industry, the picture is more complex. On the one hand, we find functionally oriented company structures, e.g. the administration and central services of a company. On the other hand, there is the project organization for each construction project, with a temporary character, involving many different companies, each of which also has its own structure. It is therefore not as easy as in the stationary industry to re-structure a company's organization according to the principle "process instead of function", but a thorough analysis of the processes is required to develop adequate structures and systems for each company. Although the Re-engineering Principle approach has been connected with promises of drastic improvements (such as cost reductions as high as 70%), there have been many projects which did not fulfill the expectations, because important aspects have not been considered.

The main success factors for re-engineering of Construction Companies from the quality viewpoint project are:

- ✓ Management commitment,
- ✓ Detailed analysis of customer requirements,
- ✓ Development of concrete strategies and quantifiable objectives,
- ✓ Sufficient resources for the project,
- ✓ Early involvement and participation of all people in the company,
- ✓ Development of process-oriented thinking in the company's culture,

- ✓ Systematic procedures (procedural model),

The last point is of great importance. Before any Construction Company starts to implement the company re-engineering this company must create own model for re-engineering, because each construction company is unique and each site has own characteristics in one word models must be created to fit for every single company. For creation of any model for the re-engineering of Construction Company from the quality viewpoint should include the following:

- ✓ Definition of strategy and objectives
- ✓ Identification of core processes
- ✓ Analysis of weak points
- ✓ Definition of business process owners
- ✓ Detailed development of processes
- ✓ Implementation of processes
- ✓ Evaluation and improvement of processes

#### **QUALITY AND INNOVATION THE SAME STORY FROM DIFFERENT POINTS OF VIEW**

Characteristic for these most developed is the effectiveness and successfulness, that basis on the price, quality, uniqueness and choice of tendered. It is about the enforcement with the knowledge, creativeness, culture, where in its broadest meaning belongs also the permanent development and environment protection. In the near future the professional systems will be estimated and compared, they will compete also with it. Today many enterprises still compete with the environment unkind products and technological instruments. The care for the enterprise dominates over the quality assurance. To consider those before us means to achieve also the level of quality assurance. The ability of competition with the world competitiveness also means the ability of competitiveness in the permanent development and quality and environment protection. It is possible to preserve the competitive advantage especially with the totality between the planning, administration, control and comprehension of entrepreneur operation content. The domain of permanent development and dealing with the quality is very sensitive domain of the whole proceeding. The permanent development and quality assurance are not only the problem of technology, chemistry, economy, and so on, but mainly and first of all of our values and behavior, that claims different point of view and inter-structural viewpoint. We need " the common viewpoint. The care for the enterprise means also the care for quality and permanent development and it is the task of management. For this reason the care for quality and permanent development is the component part of responsibility and obligations of management. The care for the quality and the permanent development depends first on

administrative workers and their collaborators on all hierarchical levels. The classical operation, limited on the expectation of competitive success in the mass production is exceeded with innovative operation that achieve the competitive position with different point of view, inter-structural collaboration. To achieve this, it is necessary to influence on the starting point of most influential people in administration and content of administration-deciding. "That's why with system and systematic research and innovation of relationship between the people in the enterprise, who has for consequence also the product or service, it appears with them equivalently the system and systematically innovation of starting point for the individual (professional) deciding, that has for the consequence the knowledge examination, communication and professional label or (entrepreneur's) culture (Mulej, 1992).

The care for the enterprise and so the care for quality and permanent development claim (dialectic) system reflection:

- The creative collaboration enables the use of different viewpoints, so the totality of reality is better realized,
- The specialists are inevitable, but for themselves only partly useful, because they see and consider only that part of reality, that the chosen point of view enables them because of the specialization
- Without collaboration they can not supplement to achieve the synergy, that they can not manage individually, but it is urgent,
- The environment protection is realized more successfully with the system of viewpoints, that many individually creatively enforce them.

The influential co-organizations of permanent development and environment protection can become all collaborators in the professional system, mainly the administrator with the deciding acting. Similar to the yin that cannot exist without the yang, the core philosophy behind is that for sustainable development the creative problem solving process has to include both:

- logical, analytical and creative problem solving,
- individual and group achievements,
- vertical and lateral thinking (or convergent and divergent thinking)
- IQ and EI (emotional intelligence)
- extrinsic and intrinsic motivation,
- specialization and holism,
- linearity and circularity,
- structure and deterministic chaos (Mulej, 1992).

In the practice it is seen as an example of indicating of quality and environment friendly products, ability of packaging recycle and so on. In the developed world the development mechanisms are already accepted over those subjects that treat irresponsibly with the quality and environment and so they increase the costs (taxes, duties, loss of reputation, and so on) and they decrease the competitive position. The decision is in the competence of company guidance. It is about something similar, as the standards prescribe ISO 900x. In this case it is about the system of administration from the quality assurance viewpoint. The enterprises will also have to adapt to such way of public information.

### **QUALITY MANAGEMENT, BUSINESS EXCELLENCE AND QUALITY INDICATORS**

Managing quality to achieve excellence means managing an organization, business or unit so that every job, every process, is carried out right, first time, every time. To be successful this must be viewed as a holistic approach that affects, and involves, everyone – employees, customers, suppliers, shareholders and society. It must be driven from within the organization, as it cannot be imposed from outside and is not a simply a cost-cutting or productivity improvement exercise [3]. The EFQM Excellence Model was introduced at the beginning of 1992 as the framework for assessing organizations for the European Quality Award. It is now the most widely used organizational framework in Europe and it has become the basis for the majority of national and regional Quality Awards.

The EFQM Excellence Model is a practical tool that can be used in a number of different ways:

- As a tool for Self-Assessment
- As a way to Benchmark with other organizations
- As a guide to identify areas for Improvement
- As the basis for a common Vocabulary and a way of thinking
- As a Structure for the organization's management system [4]

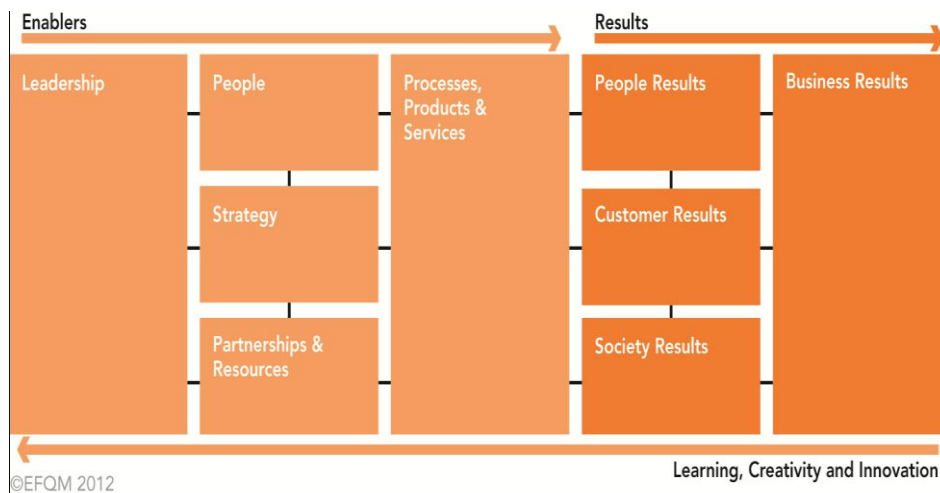
The Model, which recognizes there are many approaches to achieving sustainable excellence in all aspects of performance, is based on the premise that: *Excellent results with respect to Performance, Customers, People and Society are achieved through Leadership driving Policy and Strategy, that is delivered through People, Partnerships and Resources, and*

*Processes* [5]. Managing quality to achieve excellence means managing an organization, business or unit so that every job, every process, is carried out right, first time, every time. To be successful this must be viewed as a holistic approach that affects, and involves, everyone – employees, customers, suppliers, shareholders and society. It must be driven from within the organization, as it cannot be imposed from outside and is not a simply a cost-cutting or productivity improvement exercise [3]. The EFQM Excellence Model was introduced at the beginning of 1992 as the framework for assessing organizations for the European Quality Award. It is now the most widely used organizational framework in Europe and it has become the basis for the majority of national and regional Quality Awards. The EFQM Excellence Model is a practical tool that can be used in a number of different ways:

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**Figure 3:** EFQM Model 2012

## CONCLUSION

Corporate management should not focus on short-term benefits, but on long-term consequences of quality aimed at long-term efficiency and effectiveness of the company's business and quality activities during the process of company Re-engineering or renovation.

Currently, organizations implementing either ISO 9001:2008, or TQM do not need to comment on overall quality performance.

Neither standard comments on the degree of control exercised, the approach taken, or the effectiveness of that control during the Company renovation. Both standards advocate that participating organizations should have viewed each particular function of their business process and have applied a self-formulated quantitative/qualitative analysis to the function in question. It is this requirement for "self-formulation" that fails to provide positive incentives to the organization to add a

level of independently verifiable transparency to the analysis process [2].

It is essential for the real effectiveness of quality and environmental management to have appropriate leadership and keep well-regulated interpersonal relations in an enterprise. Congenial and stimulating atmosphere, promoting relaxed free and unimpeded activities, work satisfaction and satisfaction with co-operation with others, are all elements distinguishing excellent performance. When implementing changes, employees should be motivated adequately.

And finally, in the business processes innovation model, there is the knowledge of business processes managers to be used to implement business process quality and innovation policy in the following steps: vision, mission, strategy, tactics, and management processes.

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