

Global Perspectives in Economics, Business and Real Estate



By Samarkand State Architecture and Construction University

E-ISSN: XXXX-XXXX, P-ISSN: XXXX-XXXX

The Ways of Improving Competitiveness in Companies of the Construction Industry

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Citation: Kh. Buriev. *The Ways of Improving Competitiveness in Companies of the Construction Industry. Economics, Business and Real Estate* 2024, 1(1), 1-10.

Received: 21st July 2024
Revised: 21st August 2024
Accepted: 28th August 2024
Published: 04th Sept 2024



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Abstract: This article is based on the results of observations and expert surveys at construction industry enterprises and is devoted to the methodological problems of quality management in construction. The article examines the development of a quality management system for construction industry enterprises, a clear strategy for obtaining competitive advantages at enterprises in this area, plans for the corresponding increase in their competitiveness, and improving indicators reflecting quality leadership compared to competitors. The creation of methodological foundations for a quality competitiveness model, i.e. systems for monitoring competitiveness, preventing defects and continuous development, is also fully covered.

Keywords: Construction, Quality strategy, Quality management system, Quality improvement, Methodology, Competitiveness, Competitive advantage.



Introduction

Quality assurance and continuous improvement are crucial in managing the competitiveness of construction industry enterprises. In the decrees and decisions of the President of our country, tasks such as increasing competitiveness in the construction industry, radical reform of quality control and increasing its efficiency have been defined [1,2,3,4].

The main conclusion obtained from the results of the observations of the construction industry's enterprises and objects and the expert surveys conducted is that the methodological problems related to quality management in construction have not been solved.

First of all, although the conditions for the development of quality management systems in construction contracting enterprises have been determined by the decisions of the President and the Cabinet of Ministers, methodological developments and mechanisms have not been created regarding their content and characteristics related to the construction industry;

Secondly, managers and teams of construction industry enterprises do not have enough idea about the necessity, advantages and competitiveness of the quality management system according to the ISO 9001-2015 standard;

Thirdly, the construction industry enterprises need comprehensive views and approaches to quality strategy and management models.

The solution to these problems is creating a single methodical mechanism for developing the quality management system in the construction industry's enterprises and complexes.

According to our definition, the term "mechanism" indicates a set of organizational-economic relations, powers and functions adapted for practical application based on the general methodology of quality management systems. In addition, any economic mechanism is based on considering and motivating subjects' interests.

Literature review

The scientific research of scientists F. Perru, A. Marshall, Dj. Keynes, V. Leontyev, Y. Schumpeter, P. Sraffa, M. Porter, and F. Kotler were devoted to developing the theory and practice of competition. Acceptance as an integral part is justified—scientists such as U. Shukhart, E. Deming, F. Crossby, Dj. Djuran, A. Feigenbaum, G. Taguchi, K. Ishikawa, G. Monden, A. Glichev, R. A. Fathutdinov, N. G. Verstana are involved in quality management systems for achieving competitive advantage and paid attention and contributed significantly to creating modern quality management methodology [8,9,10,12,13,15,17, 19,20].

Issues of quality management in construction A. Shreiber, Yu. Manfred, I. Lukmanova, M. Babarin, V. Buzyrev, A. Bayburin, A. N. Djabriyev, M. K. Ziyayev, M. A. Ikramov, R. I. Nurimbetov, I. A. Usmanov, A. S. Suyunov, K. I. Turdibekov, etc. and widely covered in the research of local scientists. The author's developments are also dedicated to developing quality management systems in the construction field [5,6,7,11,14,16,18].

Methodology

The methodology for the article focuses on a systematic approach to improving competitiveness in the construction industry. The research relies on observations and expert surveys conducted at construction industry enterprises to identify the methodological problems in quality management. The methodology is built on developing a quality management system that enhances competitiveness by monitoring and preventing defects, ensuring continuous improvement, and integrating international standards like ISO



9001 and ISO 14001. The proposed method involves several stages: first, the implementation of quality management systems that comply with these international standards, ensuring thorough defect management and systematic monitoring of competitiveness. Second, a focus on human capital development through continuous training and the Kaizen system, which emphasizes ongoing improvement and engagement at all organizational levels. Third, the development of competitive indicators that reflect quality leadership and offer a strategic advantage in the market. The methodology emphasizes the integration of quality management with economic and organizational practices to achieve a comprehensive approach that aligns with modern competitive demands. This approach enables construction companies to systematically improve quality and maintain competitiveness by focusing on customer orientation, leadership, employee involvement, and process efficiency, ultimately driving growth and innovation within the industry.

Results and Discussions

The following figure (Figure-1) presents the mechanism of quality management system development in the construction link of the investment-construction chain.

Based on the scientific-methodological approach explained in the theoretical part of our study, the quality management system (SMT) of the construction industry enterprise is based on its quality concept. As shown in the diagram, it is possible to choose the concepts of quality assurance, quality management and quality assurance. In this mechanism, we considered the quality strategies of construction industry enterprises in different directions and goals; that is, the procedure for bringing the quality management system of construction industry enterprises with different initial conditions to the level of international competitiveness was followed. It is necessary to distinguish the following main links of the mechanism of improvement of QMS:

- Quality Strategy;
- Models of quality management systems;
- Structure of the quality competitiveness model.

The proposed mechanism envisages the gradual raising of all construction industry enterprises to a high level of competitiveness.

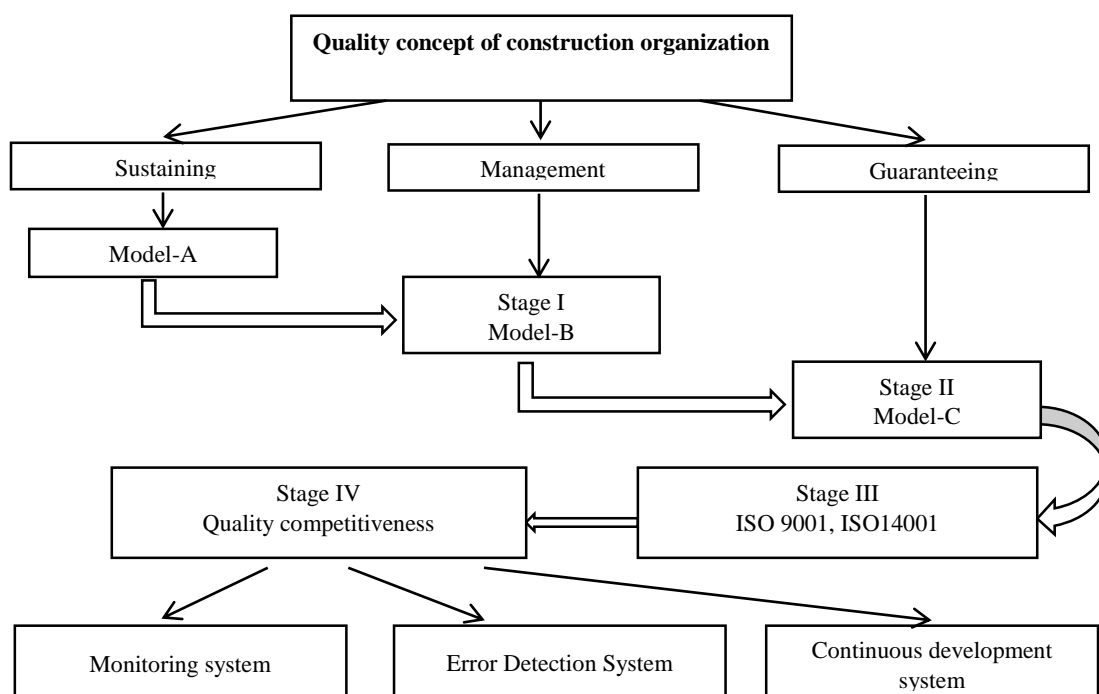




Figure 1. Mechanism of improvement of quality management system in construction enterprises.

As a result of the research, we distinguished five quality management models (Figure 1).

Table-1

Characteristics of quality management models in construction industry enterprises¹

Model	The main objective	Content	Structure
Model A	Complete compliance of the finished object with the project	- improvement of production; - correction of defects; - quality promotion	- technological requirements; - organizational requirements; - defect classification and code; - material incentive
Model B	Cost management in adapting the facility to the project	- statistical methods; - costs of correcting defects; - cost management.	- organizational, technical and economic requirements; - defect monitoring; - cost monitoring.
Model C	Guaranteeing object quality with minimum costs	- TQM (total quality management); - cost management; - quality improvement; - promotion of guarantee.	- construction process monitoring; - defect level analysis; - quality plan.
ISO 9001, ISO 14001 model	Fulfillment of consumer interests in construction	- TQM (total quality management); - quality improvement; - international competitiveness; - increase overall efficiency.	- customer orientation; - leadership; - attracting employees; - process approach; - improvement; - fact-based decisions; - relationship management.
Competitive model for quality	The achieved quality is higher than the requirements	- ISO 9001; - ISO 14001; - achieving "A" rating; - continuous improvement.	- customer orientation; - leadership; - attracting employees; - process approach; - improvement; - fact-based decisions; - relationship management; - setting the lower limit of quality.

In the model denoted conditionally by the letter "A", the quality policy in construction industry enterprises is focused on the production processes. It aims to ensure that the finished construction objects are free of defects and deficiencies. Based on this goal, in the term "quality management", identification and correction of defects, improvement of construction production, and economic incentives for quality assurance occupy the primary place. In the structural structure of this management model, technological requirements for construction work, organizational-management requirements for construction relations, quality

¹ author development



assessment conditions (defect coding and standardisation), economic requirements and methods occupy the central place.

The quality management system in enterprises using the "A" model is now formative, and its support is the main issue. Otherwise, the company will lose in the competition.

Only the management's active actions and the team's trust can lead the enterprise to the second "B" model.

The most important aspect of a construction company using the "B" model of quality management is the management's focus on quality. In the company that chose this model, all labour team members have both passion and skills to improve the quality of objects. Accordingly, the main goal is to recognise, evaluate and manage quality costs. In this model, the main tasks are statistical methods of quality, expenses related to defects, and their management. Therefore, construction enterprises that have achieved the "B" quality management model will combine quality management with financial and economic activities.

In the construction enterprises that chose the "C" model presented in the picture and table, the mechanisms formed in the above models have shown their effectiveness and are a solid foundation for further development. The primary task is integrating quality and cost management into an integrated system. From a scientific and methodological point of view, this model requires management to have in-depth knowledge of quality management. Having theoretical information about Total Quality Management (TQM) and quality improvement systems is vital.

It is worth noting that enterprise team members must ensure the availability and mutual exchange of knowledge and skills in the field. This requires organising a continuous educational process dedicated to quality management. In this model, quality assurance becomes a separate category; that is, it is necessary to guarantee the quality of the work performed by the worker, the quality of the task for which the employee is responsible, and the high quality of management activities.

The above models are necessary and reasonable steps to create a quality management system that meets ISO 9000 international quality standards. It is precisely the gradual complexity and development of goals and systemic relations that is the guarantee of achieving global competitiveness.

A construction enterprise that has passed the A, B, and C models will have the opportunity to use the ISO 9001 quality management system and ISO 14001 environmental management system quality management models.

In quality management systems certified according to ISO 9001 and ISO 14001 standards, an important main principle that distinguishes them—taking into account the consumer's interests and bringing the quality to the corresponding level—is promoted. From the organisational, economic, and social point of view, the implementation of this principle is very complicated; that is, not everyone can put the interest of management above their own.

For this reason, we will transfer the ISO 9001 and ISO 14001 models to the fourth stage.

Some authors have proposed direct transfer to the quality management system based on international standards. In our opinion, such haste can harm the idea of quality management. Therefore, the content of quality management systems certified according to ISO 9001 and ISO 14001 standards in construction comprises the TQM system, the idea of improving quality and achieving international competitiveness, intending to increase overall efficiency through quality.

Organizationally, the implementation and operation of this model are fully represented by the seven principles of ISO-9000: customer orientation, leadership, employee involvement, process approach, continuous improvement, fact-based decisions and relationship management.

Today, the national certification of quality management systems based on the ISO 9001 and ISO 14001 standards has begun. Centres established in the Ministry of Construction and Housing system conduct



preparatory work at construction enterprises and issue certificates for one year. This process is the basis for raising the quality management in enterprises to another level.

In our opinion, there are grounds and conditions for developing another model of quality management—the model of competitiveness in terms of quality. This model is used by leading companies worldwide, and its main idea is to achieve quality that exceeds consumer and most modern technical requirements.

When creating the methodological foundations of the quality competitiveness model, we should consider the modern quality management system.

One of the features of the modern quality management system is that the interests of the consumer and society have priority. In the first place, the representatives of the society include the inhabitants of this area, repeated elements of the environment, various forms and intangibles of nature.

This goal fully illuminates the essence of competitiveness in terms of quality; that is, the competitiveness of the construction process and its subjects comes from the stability of the surrounding environment. In this context, the term "surrounding environment" is a specific view of the territorial complex that may be affected by construction objects, completed buildings and structures, and construction activities. In our opinion, the term "surrounding environment" is a more accurate definition than the term "environment" and is closer to the objectives of competitiveness.

We propose to include the following in the basic elements of the quality competitiveness model in construction industry enterprises:

- System for preventing defects and their causes;
- Competitiveness monitoring system;
- System of continuous development of quality management.

In the methodology of model formation, we consider the systematic approach in which each base element is a separate system.

The task of the system of preventing defects and their causes is to provide quantitative methods and means of quality competitiveness (Fig. 2). We focused on the three links of the proposed system, that is, the principles, conditions, and structural elements of preventing defects and causes.

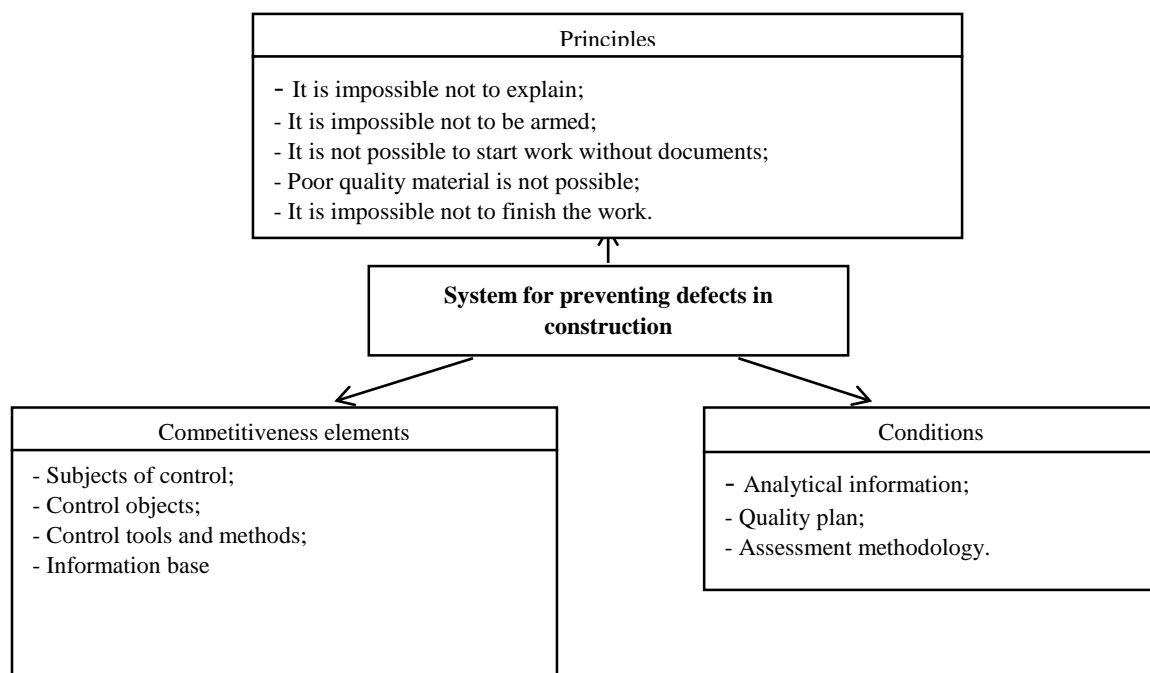




Figure-2. System for preventing defects in construction²

In creating the principles of preventing defects and causes, we tried to adapt the idea of the "5 impossibles" used in quality management in Japan to construction enterprises. We have included the following in the principles developed for this particular model:

- it is impossible not to explain the content and requirements of work, task, and operation. The essence of this principle means that the executor starts the assigned work with a perfect understanding. Defects will not appear if the performer fully understands the task and feels the responsibility;
- the workplace and labour operation cannot be unarmed. This principle envisages perfect working conditions and tools. The performer's workplace must guarantee effective work;
- it is only possible to start work with written documents. In this principle, a written document means a project drawing, a technological map, a work schedule, a work operation map, a quality control map, etc. Depending on the type and content of construction works, the document may be in different forms. The content of the principle is to clarify the person responsible for each work or element and to determine the actions in anticipation of the problems that may arise;
- it is impossible to use low-quality construction materials. This principle is aimed more at the management staff and ensures that the contractor does not deliver low-quality (non-compliant) material. In any case, the performer must use high-quality material;
- it is impossible not to complete the work. This principle is consistent with the principles of project management. It prevents unfinished work due to the simultaneous occurrence of several interrelated works in executing construction works. If such a situation is treated with indifference, the number of defects will increase like an avalanche.

In the system of defect and cause prevention, we introduced the conditions related to the second base link: a set of analytical data, a clearly measured and evaluated quality plan, and a method of objective assessment of quality and competitiveness.

The third link of the proposed system consists of organisational and economic structural elements to eliminate defects and causes. These elements are essential and the main result of the evolution of quality management. The theoretical and practical achievements accumulated by scientists and engineers over many years are reflected in these elements, even if:

- Quality control subjects are primary information carriers in the quality management system. It is the control subjects who take part in the formation of competitiveness criteria in the construction enterprise raise quality issues based on their knowledge and skills;
- quality control objects. This structural element of the system indicates the purpose, focus and fine points of quality management. Research shows that quality control is focused on objects that determine competitiveness (they either contribute significantly to quality or cause losses in quality);
- methods and tools of quality control, i.e. methodological tools and techniques found to be effective and reliable based on many years of experience;
- reliable and complete information based on quality. This element of the system forms the basis of decision-making in quality management; therefore, it must meet several requirements, including completeness, classification, numbering, quantification, etc.

The integration of these systems confirms the viability of the model.

One of the most important methodological foundations of the quality competitiveness model is the quality management development system for continuous quality improvement. The main idea of this system is to

² author development



recognise that quality management is constantly changing; that is, any achieved achievement is a sufficient basis for setting the next task.

The introduction of ISO 9001 and ISO 14001 international standards is the starting point for implementing this system in the construction industry.

The existence of a certified quality management system based on the above standards in construction industry enterprises confirms the team's and management's attention to quality, responsibility, and skills.

Knowledge, skills, responsibility, and aspiration are the main factors in the continuous development of quality management. While proposing the content and composition of this system, we take the following three methodological directions as priority (Figure 3):

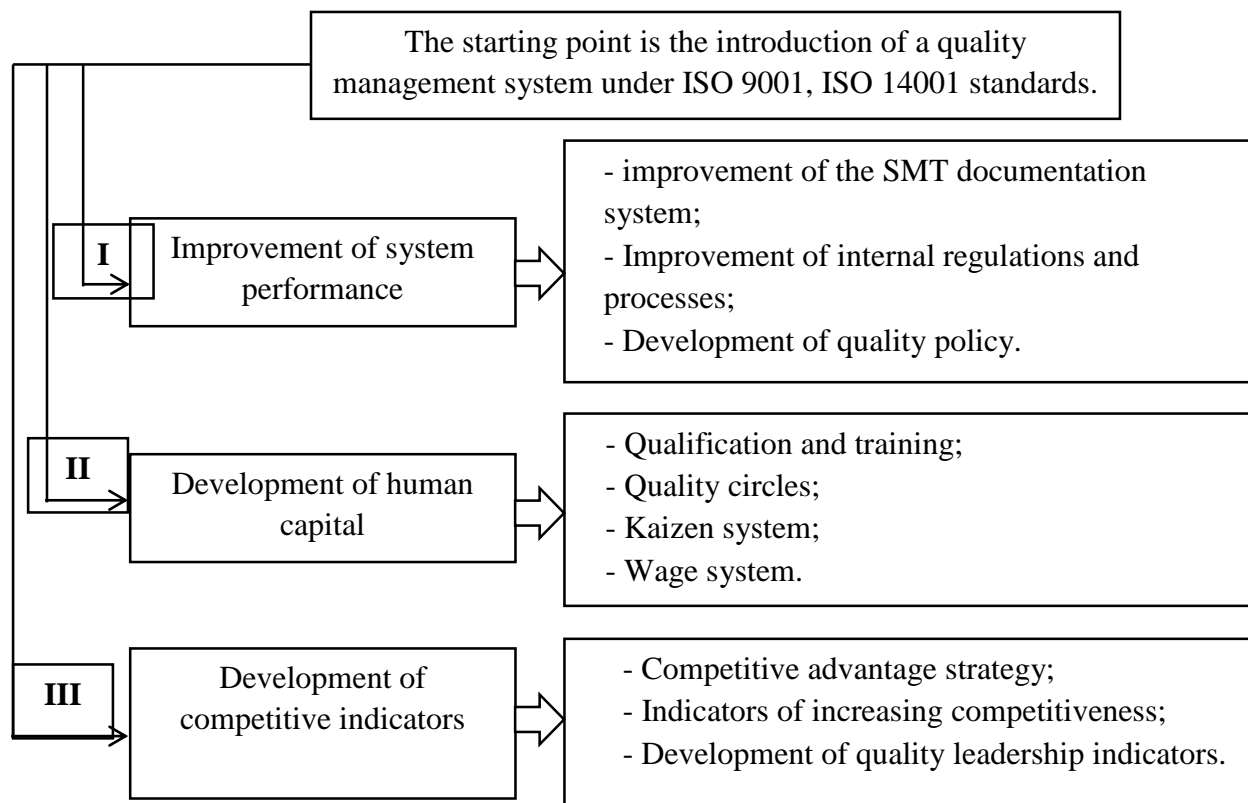


Figure-3. System of continuous development of quality management in the model of quality competitiveness³

Among the directions presented in this picture, improving quality management's content and organisational relations is excellent. Ineffective quality management is necessary to ensure the effectiveness of organisational structures and the stability of relations. Within this direction, we need to improve the quality management documentation system and provide the variability of the regulations, instructions, and processes defining the company's activities, especially the quality policy development.

The viability of the quality competitiveness model is first a set of active efforts by the team to improve quality. Second, it directly depends on the efforts to control and manage competitive forces in the business environment. In this regard, the competitiveness monitoring in our proposed model is of particular importance (Figure 4).

³ Author development

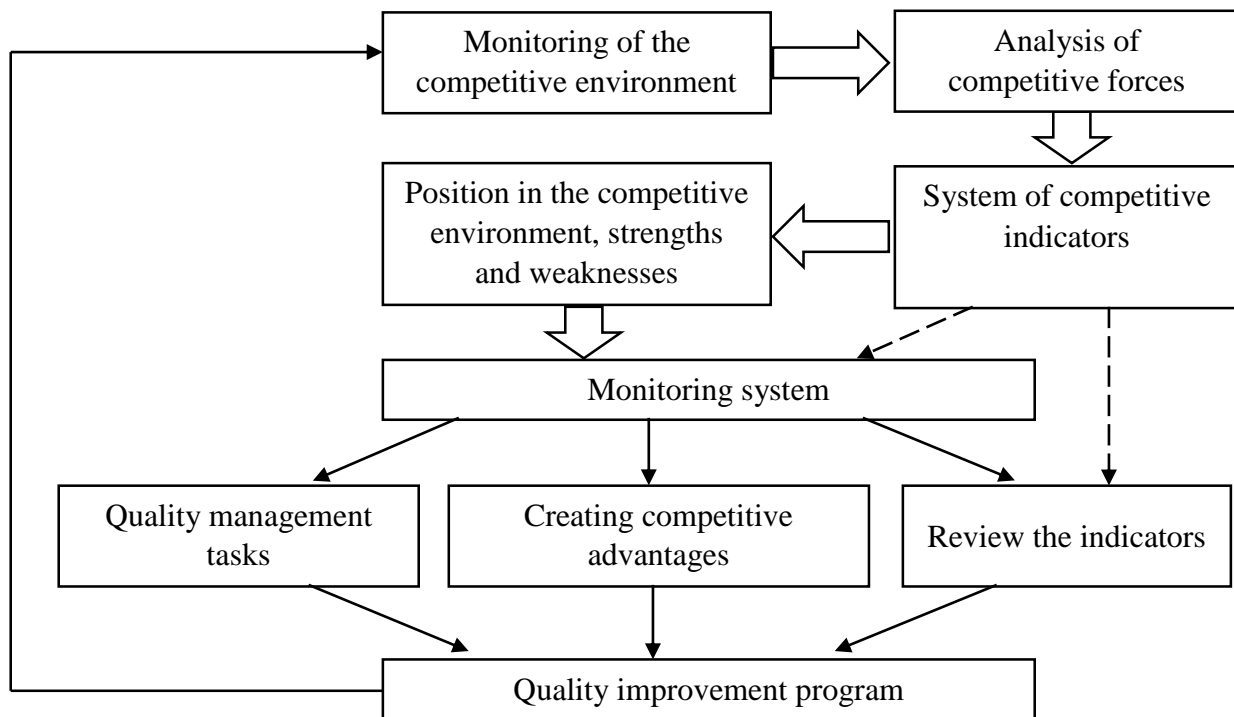


Figure-4. The competitiveness monitoring system in the quality competitiveness model ⁴.

Conclusion

Based on the socio-psychological roots of quality management, it is necessary to raise human resources to a higher level for continuous quality improvement. Quality management is greatly influenced by the feeling of not being satisfied with the results achieved, always reaching maturity, and striving for innovations. Our proposals in this direction include the use of measures and mechanisms such as quality education and training, the popularisation of quality circles, the introduction of today's popular "Kaizen" rules, and the enrichment of quality promotion methods.

Harmonisation of the continuous development of quality management with the assessment mechanism is related to the development of competitive indicators and an increase in efficiency. Construction industry enterprises should have a clear strategy for gaining a competitive advantage in this direction, plans to increase their competitiveness accordingly and improve indicators representing quality leadership compared to competitors.

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