

Conceptual Provisions of Formation of the Quality Management System Within the Integrated Corporate Structure

¹T.A. Salimova, ¹L.I. Biryukova, ¹V.I. Makolov and ²T.A. Levina

¹Ogarev Mordovia State University, Bolshevistskaya St. 68, Saransk, Russia

²Ryazan State Radio Engineering University, Gagarina St. 59, Ryazan, Russia

Abstract: The study describes the conceptual provisions of formation of the Quality Management System (QMS) within the integrated corporate structure. The factors of formation of corporations, the external and internal pre-requisites of design and implementation of the QMS in corporations have been considered. The study represents the researcher's view of the stages of the QMS formation in the integrated corporate structures and contains the conclusion stating that the process of the QMS formation in the integrated corporate structures shall be adjusted based on the type of corporation, the level of the management maturity, availability of necessary resources and environmental behavior.

Key words: Quality management system, factors, pre-requisites, integrated corporate structure, design and implementation of the quality management system

INTRODUCTION

During the last decade in the Russian economy substantial structural changes took place that also affected diversification of organizational forms of doing business and increase in the number of organizations featuring integrated corporate structure.

In the practice of countries with the developed market economy a corporation is the most common form of organization of the large business management. Today up to 60% of the USA GDP falls to the share of the 100 largest US corporations, 45% of those employed and 60% of investments. The process of formation of corporations

affects the entire set of factors the most essential of which are: international, economic and competitive, administrative (managerial), social and engineering ones (Table 1).

The QMS meeting the requirements and guidelines of the IS ISO 9000 may also be referred to the modern tools promoting to increase in the competitiveness of the integrated corporate structures. Today creation and improvement of a QMS in corporations of different kinds is a topical issue (Levina, 2014).

MATERIALS AND METHODS

Pre-requisites and factors of the qms formation in a corporation: The modern QMS is relevant in terms of improvement of the management efficiency in the corporate structure that shall be focused on identification of the needs and expectations of all the stakeholders of the company and increase in their satisfaction, harmonization of documentation and processes within the corporation and finally on the improvement of its competitiveness within the dynamic environment. The process of the QMS implementation is a complex project because of the peculiar features of the corporate structure characterized by presence of the independent business units, multi-layered nature of the internal communications, complexity of the management system, complex mechanism of interaction between the control structure and subsidiaries, etc.

Table 1: Main factors promoting to formation of corporations

Groups of factors	Factors
International	Globalization of the world economy Internationalization of the world market Extension of the WTO (including Russia into it)
Economic and competitive	Attraction of the domestic and foreign investments Necessity of diversification of the range of products manufactured Increased competition between the companies Movement of the accumulated capital towards more promising trends of activity Increase in expenditures on research and development
Administrative	Improvement of efficiency and management quality Increase in the relevance of the various marketing, consulting and other management subsystems
Legal	Fulfillment of legal obligations
Social	Fulfillment of social obligations Increase in satisfaction of different groups of the company stakeholders (shareholders, staff, society, state, etc.)
Engineering	Performing technical re-equipment on the innovative basis

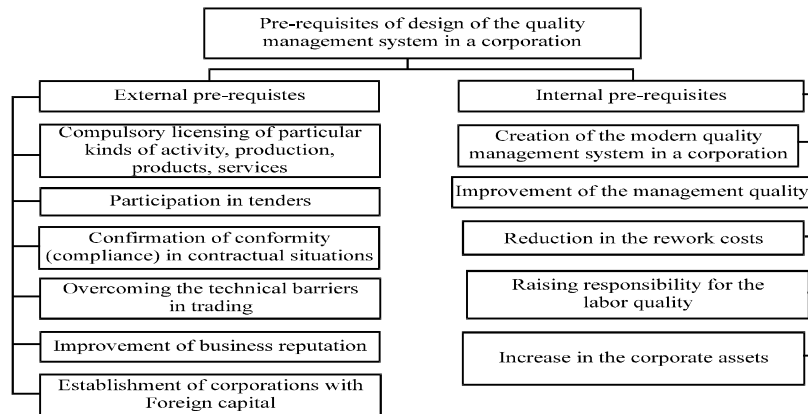


Fig. 1: External and internal pre-requisites of the QMS design and implementation in a corporation

According to the requirements of the international standard ISO 9001:2008 creation of a QMS requires strategic decision of the company making of which may be affected by the internal and external corporate environment, risks related to this environment, the changeable business needs, features of the products manufactured, processes applied, the corporate size and structure as well as specific goals and grounds of the QMS formation.

The necessity of the QMS formation in the integrated corporate structures in whole as well as at the level of their separate business units may arise under the influence of a significant number of factors and pre-requisites that may be conventionally divided into two groups: external and internal ones (Fig. 1) (Gorbashko, 2008). The external pre-requisites of the QMS formation include:

Presence of the state system for compulsory licensing of particular kinds of activity, production, products, services. In the today Russia, the presence of the QMS or the quality control system meeting the requirements of the industry management standards or separate elements thereof is required in order to obtain licenses for:

- Development, production, testing, storing, sales and disposal of ammunition and explosives (Anonymous, 2011)
- Drug production (Anonymous, 2012)
- Performance of mine-surveying works, etc.

Participation in tenders and other tendering procedures for delivery of products and services both to the internal and external markets:

- Receipt of the state order according to the requirements of the FZ-44 d/d 05.04.2013 “Concerning

the contract systems in the sphere of procurement of goods, works and services for provisioning governmental and municipal needs” is to a great extent related to presence of the certified QMS in a corporation

- Performing supplies to the companies the procurement activity of which is regulated by the requirements of the FZ-223 d/d 18.07.2011 ‘Concerning procurement of goods, works and services by separate kinds of legal entities’
- Receipt by a corporation of subcontracts both from the Foreign customers and from the Russian export-oriented companies often depends on the presence of the QMS in a company

The legislation of a number of countries and since 2000 the Russian one as well in all disputable situation relating to the quality and safety of products and services requires confirmation of compliance of the products and services supplied to the market with the modern scientific and technical level whereby the presence of the certified QMS is considered as such confirmation.

Presence of the certified QMS in a supplying company allows it overcoming a number of non-tariff (technical) barriers in trading without financial, temporary and organizational costs. This practice is fixed in agreements developed at the WTO level (Anonymous, 1994), the customs union and other international and regional organizations specializing in the issues of technical regulation in the Foreign trade.

The QMS certification ensures the necessary creditability level at the market and improves, its business reputation since the certificate of conformity is deemed to be the guarantee of quality.

For assessment of the business reputation of a corporation including the sphere of sustainable

development the indices of different kind are used. The most famous one among them is the Dow Jones Sustainability Index (DJSI) by estimation of which the 3 component are taken into account:

- Quality management
- Eco-management and measures aimed at the environmental protection
- Socially responsible business behavior

The insurance, lease, factoring and credit options as well as some other kinds of support by financial institutions of transactions for supply of products and services to the Foreign and often domestic market require confirmation of the company stability, primarily in terms of risks relating to the product quality and safety which in some degree may be confirmed by the presence of the certified QMS.

The prospects of creation of corporations with Foreign capital also depend on the presence of the certified QMS in partners. According to the potential investors, the absence of the QMS places in question the reliability of investments and possibility of penetration of the new sales markets.

The internal pre-requisites of the QMS design and implementation in the integrated corporate structures in whole as well as at the level of separate business units may include.

Creation of the modern management system since in the international standards ISO 9000 the best world management practice has been accumulated that is based on the Shewhart-Deming Continuous improvement cycle (PDCA), TQM-principle and provides the basis for design of the integrated management systems.

The presence of the QMS improves the quality of the corporate management in whole. The optimal combination of the administrative functions and the scope of delegated

authorities, the responsibility matrices and other tools used by the QMS allows improving the management quality significantly and changing the role of the corporate leaders focusing their attention primarily on the strategic management.

The QMS operation suggests involvement of the entire staff in the quality assurance at all stages of the product lifecycle from the demand analysis to maintenance of the finished products which significantly raises the performer's responsibility for the labor quality.

The QMS allows significantly reducing the rework costs and therefore, reducing the production costs. Being the customer and other stakeholder-oriented, the QMS allows preventing customer claims due to formation of the exact mechanism of preventive and corrective measures in the area of quality of products manufactured. The presence of the QMS in a corporation promotes to increase in its assets that include:

- Intangible assets including goodwill that may increase as the result of increase in the cost of the trademark of a manufacturer that sustainably outputs the high-quality products
- Financial assets may increase as the result of the capitalization of income caused by increase in turnover (rise in the high-quality product price, development of the new sales markets, etc.)

RESULTS AND DISCUSSION

Stages of the QMS design and implementation in a corporation: Regardless of which of the above-mentioned pre-requisites will act as the key one by making the strategic decision, it shall be based on the readiness of the corporate management to fulfill the leading functions at all stages of implementation of the process aimed at the QMS formation (Fig. 2) (Loganina *et al.*, 2008).

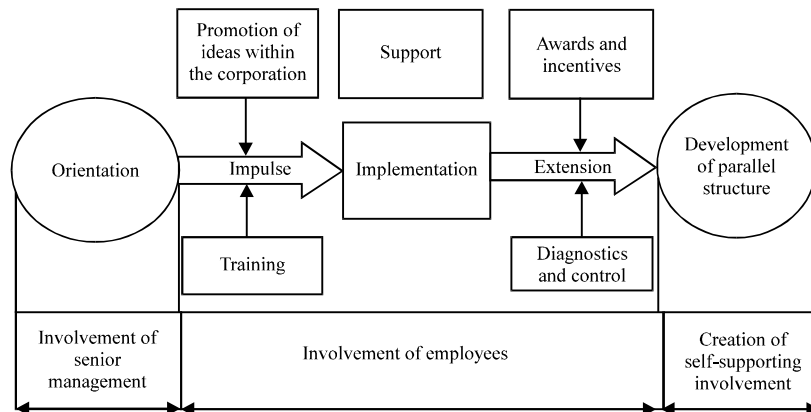


Fig. 2: The role of the management leadership in the process of formation of the corporate QMS

Table 2: Structure and content of the project aimed at formation of the QMS of a corporation

Project stages	Content of the project stages
SET-UP	Implementation of the set of preparatory activities aimed at the QMS design
Decision of the management concerning the QMS design	Issue of the relevant order; assignment of the management representative for the issues of quality
Formation of the QMS organizational structure	Creation of the strategic, tactic and operating levels of the QMS organizational structure: coordination board (council for quality); quality service; definition of the areas of authorities and responsibilities of business units; making decision as to the necessity of involvement of advisors
Staff training	Teaching the management and leading specialists of the corporate center and business units participating in implementation of the QMS formation project
Definition of the QMS application area	Identification of the QMS boundaries by kinds of the products manufactured and services, processes of their life cycle and operating areas (business units)
Diagnostics of the existing corporate management system	Analysis and evaluation of the organizational and technical-economic conditions of the QMS implementation in the corporate center and business units falling within the QMS application area
Development of the QMS formation program	Identification of the stages of the QMS design and implementation, assignment of responsible officers, setting the term and resources required
Principal	QMS design and implementation
Formation of policy and quality objectives	Development of general intentions and trends of the corporation activity in the sphere of quality, setting of corresponding goals; development of the policy and objectives in the sphere of quality of a business unit on the basis of the cascading method
QMS design	Identification of processes and design of the process model of the QMS of a corporation; design of the authorities and responsibilities distribution matrix of the corporate center and business units for the process management
QMS documenting	Documenting the operating procedure within the frameworks of the QMS designed
QMS implementation	Implementation of activities aimed at the QMS approbation at the level of the corporate center and business units including: staff involvement in the quality management activity, implementation of the QMS documents and control of compliance with their requirements, making the report of the QMS implementation
Final	Internal and external QMS evaluation
Internal recognition of QMS	Performance evaluation of the corporate QMS and the separate components thereof on the basis of: data analysis (p. 8.4. ISO 9001:2008); management review (p. 5.6. ISO 9001:2008); quality audit (p. 8.2.2. ISO 9001:2008); self-assessment (p. 8.3.4. ISO 9004:2009); benchmarking (p. 8.3.5. ISO 9004:2009) development and implementation of corrective measures
External recognition of QMS	Certification of the corporate QMS; participation in international, national and regional quality competitions
QMS Improvement	Assessment of the QMS performance and efficiency, development and implementation of the set of measures aimed at improvement thereof based on the local and universal improvements in particular: integration in the QMS of the requirements of standards for the management systems by particular aspects of activity; implementation of the industry-specific requirements to the corporate QMS; application of the best management practices; striving for achieving the organizational perfection on the basis of the specific model

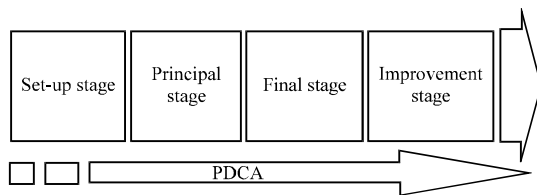


Fig. 3: The structure of the project aimed at forming the QMS of a corporation

The QMS design in the integrated corporate structures is a rather labor-consuming and lasting process suggesting performance of a number of events and activities that may be conventionally divided into the following stages: set-up, principal, final and improvement ones. This kind of the project structuring corresponds to the Shewhart-Deming Continuous improvement cycle (PDCA) (Fig. 3). The standard components and brief characteristics of these stages are presented in Table 2.

The data of Table 2 prove that in point of fact the process of the QMS formation in the integrated corporate structures represents the approach to improvement of the management system through orienting it towards the customer needs and optimization of business processes.

At the first stage of the process of the QMS formation, a corporation identifies the needs and expectations of customers, owners and other stakeholders. At the second stage, the strategies and trends of policy of the corporate center and business units in the sphere of quality are set. The business process required for implementation of the strategies and methods of assessment of their performance and efficiency are specified. On the basis of the results of monitoring and measurement of the operation of the corporate QMS and its separate components the measures for optimization of the organizational structure, business processes, their documentation and resources provision are developed.

Table 3: The peculiarities of scoping the area of application of the corporate QMS

Corporate management type	Description of the corporate management type	Peculiarities of scoping the area of application of the corporate QMS
Vertically-integrated corporation	The strategy of technological diversification suggesting control of the entire production chain from the raw materials to the finished products	The boundaries of the areas of the QMS application may be as wide as possible. The variations are only possible in terms of selection of the stock list of products manufactured and services The QMS is applied to: the corporate center in terms of the management and procurement processes; all business units involved in the manufacturing process
Conglomerate corporation	The strategy of independent diversification suggesting the corporation going beyond the conventional production or commercial chain and searching for the new kinds of activity that differ from the already existing ones both through the technology and the sales markets. As a rule, the business units included in the corporation are not interrelated. The main goal of a conglomerate corporation is minimization of financial risks	The boundaries of the areas of the QMS application may be as narrow as possible Initially a business unit is selected within the stock list of which specific kinds of products manufactured and services may be selected The role of the corporate center in the QMS directly depends on the degree of centralization of the management and procurement functions. Upon the low level of centralization the QMS may be designed within a separate business unit
Horizontally-integrated corporation	The strategy of interrelated diversification suggesting searching for the new kinds of activity supplementing the already existing ones in terms of technological and commercial aspects for the purpose of achieving the synergy effect. Synergy is ensured by means of using the workforce capacity, the common sales and product distribution channels, etc. At the same time, the main production profile remains to be the same	The boundaries of the areas of the QMS application may be as variable as possible Initially a through manufacturing procedure used in different business units of the corporation for manufacturing of different kinds of products and services is selected The role of the corporate center in the QMS is related to ensuring interaction of business units within the through manufacturing procedures and complementary kinds of products and services

The effective implementation of a number of the project stages aimed at the QMS formation is not possible without taking into account the specifics of the corporate management. In our opinion, the following may be referred to such peculiarities.

Defining the area of application of the corporate QMS that is based on the nature of the products and services, the processes of production thereof, the results of the risk assessment, commercial considerations as well as contractual, legislative and regulatory requirements (Anonymous, 2004). The boundaries of the QMS application are set by the corporation itself within the frameworks of the set-up stage of the project for the purposes of clarification of the scope of outstanding works. These boundaries are 3-dimensional and depend on the following factors:

- The stock list of the products manufactured and services rendered to which the requirements of the corporate QMS will apply
- The basic processes and kinds of activity related to production of the specified stock list of products and services
- The operating areas and structural units relating to the specified stock list of products and services (Kachalov, 2007)

Ideally, the QMS requirements shall cover the entire operation of the corporation. However, such approach is

resource-consuming, requires significant time, financial and material expenditures. Besides, it is not always economically sound in terms of satisfaction of the needs of customers and other corporate stakeholders.

In most cases the area of application of the corporate QMS features a narrow scale and to a great extent depends on the corporate management type (Table 3).

Design of the organizational structure of the corporate QMS suggests formation of the multilayer structure (Fig. 4).

The general director of the corporation initiates the project aimed at formation and improvement of the corporate QMS as well as creation of conditions for implementation thereof in particular from the perspective of resources provision. The area of responsibility is determined by the requirements of the Section 5 ‘Management responsibility’ and p. 6.1 ‘Provision of resources’ of ISO 9001:2008.

The representative of the corporate management on the matters of quality performs overall management of the project aimed at formation of the corporate QMS. Establishment of the administrative vertical and coordination of works at the level of the corporate center and business units. The area of responsibility is determined by the requirements of the p. 5.5.2. ‘Representative of management’ ISO 9001:2008. As a rule in large corporations, the representative of management on the matters of quality is an independent position (deputy general director on the matters of quality). In the



Fig. 4: Organizational structure of the corporate QMS

middle and small integrated corporate structures, these are additional functional responsibilities of the deputy general operating director or commercial director.

The coordination board for quality is an advisory body at the top executive of the corporation. The board includes the representatives of the top management of the corporate center as well as business units' managers. The key trends of its development are:

- Setting the policy and goals of corporation in the sphere of quality
- Control of the process of design, implementation and operation of the corporate QMS in whole and its separate business units
- Specifying the trends of the corporate QMS improvement and development

As a rule, responsibility for performance of works on formation of the corporate QMS is centralized at the level of the corporate center. For this purpose, a separate structural unit quality control department is created the responsibilities of which include:

- Preparation of the program of formation of the corporate QMS

- Design and implementation of the organizational structure of the corporate QMS
- Formation of the flow chart with indication of the responsibilities and tasks of all business units included in the corporate QMS
- Design of the QMS documentation including the necessary forms and records, documented procedures, quality manual together with the officer responsible for quality in the corporate business units
- Systematization of business processes, identification of the measurable parameters and their quality features, methods of monitoring, measurement and data collection
- Performance of internal audits and self-assessment of the corporation operation in whole, its separate business units and processes
- Participation in the process of certification of the corporate QMS
- Maintaining the effective operation of the QMS and corporation management system in whole

The quality control department of the corporate center efficiently manages the working groups of business units.

Business unit manager, representative of management on the matters of quality at the business unit level. As a rule, the business unit managers are members of the coordination board for the corporation quality. The job description is determined by the requirements of the p. 5.5.2. 'Representative of management' ISO 9001:2008. The area of responsibility business unit.

As a rule, at the business unit level the quality control department is not created as a separate structural unit as a consequence of centralization of functions. Instead, the matrix structure is used: the working (project) group is created that during the entire project term performs the entire scope of works on formation of the QMS of a business unit.

The working group leader is subordinated to the quality control department of the corporate center. The officers responsible for quality in the structural units are conductors of the policy in the sphere of quality at all levels of the corporate structure, take participation in design of the QMS documentation, performance of internal audits and self-assessment, collection and processing of data obtained, formation and implementation of the corrective measures plans, etc. They are subordinated to the working group leader of the business unit responsible for the QMS formation.

In our opinion by formation of organizational structure of the corporate QMS the following principles shall be adhered to:

- Uniformity of management technologies and models applied to all levels of the corporation management system
- Ensuring the optimal delegation of each decision shall be taken and each action shall be performed at that very point of the corporation horizontal and vertical where it appears to be the most optimal and efficient in terms of achievement of the fundamental goals of the QMS project implementation

Training of the staff involved in the project implementation. The employees of the quality control department and members of working groups created both at the level of the corporate center and at the business unit level shall complete training according to the programs including study of requirements of the ISO 9000 standards, the process approach as well as methods of the QMS design and design of the relevant documentation support. Along with the insight into the basic concepts in the sphere of the quality management the training program shall include the workshops within which the learners could apply the knowledge acquired in practice. By organization of training special attention shall be paid to training of top management that shall be performed first of all.

Training may be either external or internal. The latter is more preferred for corporations due to the complexity and 'territorial fragmentation' of the management structure (Ivantsevich and Lobanov, 1993). Such training shall be performed with due regard to:

- The modular approach that includes design of the training programs and courseware, scheduling and implementation of the training process based on the modules that are maximally adapted to the level of the learners' competences and their role in the QMS formation project
- The territorial-production approach laying emphasis on the assumption that the training process shall be maximally approximated to the working place of an employee for the purpose of optimization of financial costs, work time expenditures and integration of knowledge in the sphere of the quality management in the operating activity of a learner
- Cascading method: At the set-up stage of the project for QMS formation it makes sense to perform training using the vertical cascading method from the corporate center to business units and their separate structural units. At the final stage training as the method of the staff involvement in the corporate QMS should be performed using the horizontal

cascading method. Transition from one level (cascade) of learning to another one may be performed both successive and in parallel

CONCLUSION

Thus, the procedure of design, implementation and improvement of the QMS in a corporation proposed by the authors is the basic one. In each particular case, it may be specified and adjusted proceeding from the type of corporation, management maturity level, availability of necessary resources and environmental behavior.

REFERENCES

- Anonymous, 2004. ISO 9001 Auditing Practices Group Guidance on: Scope of ISO 9001:2000, Scope of Quality Management System (QMS) and the Scope of Registration/Certification, 24 November 2004.
- Anonymous, 2011. Regulations on Licensing of Design, Production, Testing, Storing, Sales and Disposal of Ammunition (Including Cartridges for Civilian and Service Weapon and Cartridge Components), Pyrotechnic Products of the IV and V Grades According to the National Standard, the Use of the Pyrotechnic Products of the IV and V Grades According to the Technical Guidelines (Approved by the RF Government Decree d/d September 14, 2012 N 925).
- Anonymous, 2012. Regulations on Licensing of the Drug Manufacturing (Approved by the RF Government Decree d/d July 6, 2012 N 686).
- Anonymous, 1994. Agreement on Technical Barriers to Trade (WTO, the Uruguay Round of the Multilateral Trade Negotiations).
- Gorbashko, E.A., 2008. Quality Management: Text Book. SPb.: Piter, pp: 384.
- Ivantsevich, J. and A.A. Lobanov, 1993. Human Resources of Management. Business, pp: 304.
- Kachalov, V.A., 2007. 'What Determines the Boundaries of the QMS Application?' Quality Management Methods, 6: 24-27.
- Levina, T.A., 2014. The QMS Design in an Organization with the Integrated Corporate Structure. Collection of Materials of the XXIV International Research and Practice Conference 'Modern Trends in the Economy and Management: the Fresh Approach', Novosibirsk, 24: 157-164.
- Loganina, V.I., O.V. Karpova and R.V. Tarasov, 2008. Design of the Quality Management System at Enterprises. Practical Guidance. KDU, pp: 148.