
The Role of Managerial Cost Accounting in Providing and Improving the Quality of Goods and Services

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ABSTRACT

The article considers managerial accounting of costs for providing and improving the quality of products, works, services. The controlling element in the quality management system of products, works and services of the structural subdivision of Tatneft PJSC of the Aznakaevskneft Oil and Gas Production Department (Aznakaevskneft OGPD) was chosen as the subject of the study. The Aznakaevsky well service workshop (WSW) will act as the analyzed facility. The results of this study are the development of practical recommendations for improving the accounting of costs for quality in accordance with the modern requirements for information support by the Department of Tatneft PJSC of Aznakaevskneft OGPD, namely: we have developed a classification of costs for quality with a breakdown of costs by levels; we have provided the scheme of development and introduction of the accounting of costs for quality; we have generalized the classification of costs for quality; we have justified the necessity of forming a cross-functional group engaged in the process, generalization and analysis of information on the costs for quality; we have submitted the forms and registers, enabling to process, summarize and analyze the costs for quality; we have provided the recommended structure of the account "Costs for quality of products, works, services".

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1. INTRODUCTION

If controlling of the quality management system is poor and does not meet the requirements of objectivity, completeness, timeliness, relevance, etc., the enterprise may put itself in a desperate situation. A quality management system and computer based process for managing quality are disclosed. The quality management system includes a set of networked operator stations for entering data including critical to quality customer information and information relating to the equipment to be monitored on a quality basis. The system further includes an application server on the network for running the programs of the system such as critical to quality setup, report generation, logging to the database, and maintenance events. As decision makers become more involved in implementing Total Quality Management, questions are raised about which management practices should be emphasized. In this exploratory investigation of the relationship of specific quality management practices to quality performance, a framework was constructed. It focuses on both core quality management practices and on the infrastructure that creates an environment supportive of their use. In addition, it incorporates two measures of quality performance and their role in establishing and sustaining a competitive advantage.

Dittner & Flarcker (2001) applied a value-based management framework to critically review empirical research in managerial accounting. This framework enables us to place the exceptionally diverse set of managerial accounting studies from the past several decades into an integrated structure. In our opinion, the issues of cost accounting for the product quality are still unresolved or are debatable. They include: the lack of adaptability of the information provided in the changing circumstances of the internal and external environment; the disparity in the information received about the costs for product quality; insufficient attention in the justification of the content of costs and methods of their accounting to industry, technological and organizational characteristics of the enterprises, etc. These and other reasons do not enable us to fully implement the operational, tactical and strategic tasks associated with the cost management for quality.

2. METHODOLOGY

Tatneft PJSC of Aznakayevskneft Oil and Gas Production Department is one of the largest domestic oil companies. The company accounts for about 8% of all oil produced in the Russian Federation and over 80% of oil produced in Tatarstan. Aznakaevskneft OGPD is one of the oil and gas production departments of Tatneft Company. The activity base of the OGPD is extraction, preparation and primary processing of oil and gas (Tatneft JSC). The Department of Aznakaevskneft unites in its composition:

- 7 oil and gas production workshops (OGPW);
- 2 reservoir pressure maintenance workshops (RPMW);
- Integrated oil processing and pumping workshop (IOPPW);
- Well service workshop (WSW);
- Production, maintenance site.

In 2016, 85% of the total number of repairing wells accounts for Aznakaevsky WSW in Aznakayevskneft OGPD. In 2016 and early 2017, the issue related to well repairs carried out by the structural subdivision of the WSW was especially acute nature in Aznakayevskneft OGPD. There were complaints about the number of repairs performed for the year and their quality due to the lack of comprehensive and well-established scientific and practical approach to the quality management system of the repair services provided. It is noted in the international standards setting requirements for the quality systems that the costs associated with quality are calculated within the organization according to its own criteria (International Standardization Organization). The international standards of the quality system give recommendations only on some methods of calculating the costs of quality of external (financial) reporting on the manufacturer activities for the sake of monotony, comparability and generalization of economic information (Goshunova and Kirpikov, 2016).

The components of costs associated with the domestic economic activities are analyzed on the basis of the cost accounting model: prevention, evaluation, defects (Neizvestnaya and Antonova, 2015). The components of these costs in relation to the object of study are as follows:

- a) The costs for prevention related to the prevention of defects;
- b) The costs for evaluation, including the costs for testing, monitoring and inspection;
- c) The internal costs, which are a consequence of defects occurring before the facility commissioning due to the fact that the service rendered does not meet the quality requirements;
- d) The external costs, which are the consequence of defects, i.e. the costs that arise after the service is rendered when it turns out that the service does not meet the quality requirements.

There are two approaches to the development of the cost management strategy for quality. Their main difference is associated with different landmarks when planning an acceptable amount of parameter deviations of the actually created facility from their nominal values (Guskova et al., 2012). The traditional approach is guided by the most economically advantageous amount of such deviations for the enterprise (the approach to cost management based on the optimization of defects) (Mikhailova, 2010).

Another approach, which has appeared later and is applied in leading, especially Japanese, organizations, focuses on the use of the Crosby concept of "zero defects", as the most cost-effective (Kozlova and Fayzrakhmanova, 2015). Table 1 shows that the Japanese firms that focus on "zero defects" and are forced to spend on the defect prevention on average five times more than US firms have significantly better cost rates for checking deviations from quality and costs for quality control.

Table 1. Comparison of Cost-Effectiveness Strategies for Quality

Costs	Share in costs, %	
	USA	Japan
Prophylaxis	0,5	2,5
Checking	4,5	3
Correction and repair	20	7,5
TOTAL:	25	13

They have a nearly twice as effective economic strategy for the quality cost management. This enables the commodity producers using this approach to reduce production costs and to obtain serious competitive advantages (Gorbunova, 2011). Based on these dependencies, one can characterize the strategic direction of leading firms in the field of quality costs: increasing the costs for preventing deviations (defect control), gradually reducing the costs for inspection and quality assessment, it is necessary to achieve the cost reduction due to the internal and external failures in order to reduce the company's overall costs associated with the product quality. When the product quality is increased, the consumer's gain first grows rapidly, and then begins to decline steadily. And the manufacturer has the contrary effect - an increase in the costs for product production and operation with higher quality indicators, which has been slow in the beginning, begins to increase (Kirpikov and Goshunova, 2016). The study has found that a quantity level, in which the difference between the consumer's gain and the costs for manufacturing will be the greatest, shall be considered optimal.

During the study of the work of the quality management system, we have carried out the analysis of the current system in the OGPД, OGPW, RPMW and WSW. The main cost drivers at this stage are the number of repairs, the duration of one repair and the cost of a brigade-hour. The main areas of cost reduction are as follows:

- Optimization of the number of repairs,
- Increase the between-repair period of the well operation,
- Optimization of current well repair capabilities;
- Reduction of the repair duration;
- Reduction in the cost of brigade-hour.

At the moment, the annual cost limits are being formed for current well repair. The Economic Service of the OGPД determines the cost limit for the good service workshop based on the conditions for the formation of the operating cost limit for the planned year specified by the Economic Department of Tatneft JSC. Proceeding from the allocated limit of the OGPW (RPMW) service, they form the annual plan for the types of works: on restoration of well serviceability, implementation of prospective geological measures and repair of injection wells. The limit on carrying out the current repair of wells is determined through the planned duration and the cost of a brigade-hour. Based on the work nomenclature, the OGPW (RPMW) shall submit the repair plans to the WSW. The cost of repair is determined on the basis of the planned cost of a brigade-hour and the actual repair duration. The analysis of the work effectiveness carried out by the OGPW, RPMW, WSW brigades (it is required to analyze the economy, the over-expenditure of the planned cost limit only) is carried out quarterly and is determined on the basis of operational accounting. On a monthly basis, the production workshops and the WSW shall account for the actual costs for ongoing repairs, draw up a register, where they shall indicate the duration of repairs under the technical orders for the WS (taking into account the rolling wheels). Based on the work results for the quarter, the Economic Service sums up the results: the costs for the registers submitted are deducted from the workshop limit. The funds saved from the cost limit are sent to the Cost Saving Fund and partly - for bonus payments to the employees. It has been revealed that the data collection system for repairs is organized into two levels in the Department:

- 1) the information is formed in the Economic Department of the workshop and is sent to the Accounting and Tax Accounting Department and the Planning and Economic Department;
- 2) The data collection on well repairs is formed by the Technological Department of the workshop and is organized in the automated system "ARMITS".

3. RESULTS AND DISCUSSION

It is recommended to make a bias on the defect control, that is, to strive for its zero value in the Aznakaevsky WSW. This is primarily due to a technological reason, namely, that the well has a certain daily flow rate and the volume of the pumped liquid. Accordingly, each production defect bears not only the costs for its liquidation, but also a certain amount of lost profits associated with the oil shortages. All the enterprise activities on the development and implementation of the cost accounting system for quality may be broken down into the following stages, which are specified in Figure 1.

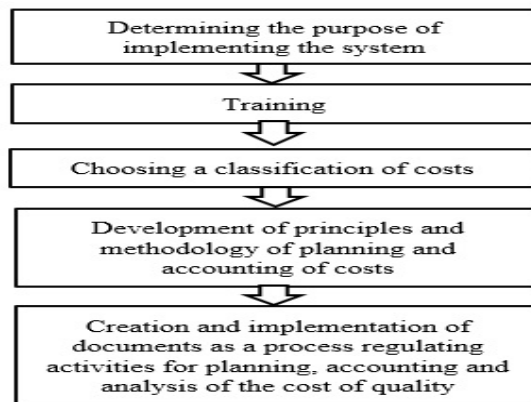


Figure 1.
Scheme for the development and implementation of cost accounting for quality

The quality, cost accounting enables to present a real picture of a state of affairs in the field of product quality. Ultimately, the information on the quality costs creates the prerequisites for the adoption of strategic, tactical and operational management decisions. The starting point in determining the costs of quality is their classification, i.e. the definition of the composition and structure of costs, grouped by a certain feature. Our studies have shown that the most common classification method of these costs is A. Feigenbaum's method, called PAF. Its classification is criticized by some specialists because the costs necessary to ensure quality are equated to losses, and this does not enable to compare the costs for quality maintenance and losses. In addition, using such classification, we can face some difficulties, since some elements can be attributed to any of three categories of costs on an equal basis. The concept offered by the Japanese specialists is more justified. The approach it provides enables to resolve the deadlock situation established in the economic researches on the problem of quality costs and provides answers to the important questions: what is the difference between the cost of production and the quality costs?; what part of the cost of production, services and works is accounted for the quality costs?

One of the main principles of TQM (Total quality management) is the process approach. A process is understood as a set of successive actions (functions, works) that transform the basic material (raw materials, semi-finished products, information) into the final product (service) in accordance with the pre-established rules (standards, regulations) (Kharisova and Kozlova, 2014). An important aspect of this approach is associated with the identification of processes, procedures, operations that add value to the output products. The advantage of the TQM concept is in the fact that it requires to control the processes, but not just the end results. Based on the theory and practice of the researches, it shall be noted that the classification of costs for product quality shall be based on the signs of their origin, types and carriers of costs. All the quality costs can be divided into three groups: the costs for quality improvement, quality assurance and loss from the non-compliance. The need to distinguish them in groups is due to their different economic nature, different values for the evaluation of performance results.

The main requirement is full coverage of all costs associated with quality, as well as a characteristic that reflects the complex and multifactorial nature of the quality formation process. These requirements are met by a generalized classification of costs for quality specified in Table 2.

Table 2. Generalized Classification of Costs for Quality

Characteristic of classification	Cost group
Special purpose	On quality assurance To improve quality
Time of occurrence	Current, One-time
Cost element	Productive, Non-Performance
Method of determination	Direct, Indirect
The possibility of accounting	Directly accountable Not directly accountable Costs that are not economically feasible
The possibility of evaluation	Planned, Actual
Objects of formation and accounting	Production, processes, services & Services
Places of Implementation	Enterprise, department, shop, site, team, workplace

One of the problems we identified was the lack of economic validity of those or their activities, cycling of accounting and analytical work at the limits, lack of work on deviations. The next problem identified has been the fact that the data collected on costs are summarized only by the elements of costs, and the allocation of costs associated with repair quality is not conducted. Taking into account the above, there is the problem of insufficient work to improve the quality of work performed, the main focus of these activities is aimed at improving the technical component of repair, while organizational, methodological and methodological moments are also important (Mikhailova, 2010). In order to solve the identified problems, we offer to form a cross-functional group of specialists engaged in the processing, generalization and analysis of information on the costs for quality. In order to collect the costs for quality in the workshop, we suggest using the register shown in Table 3.

Table 3. Record Sheet of Cost Accounting

Cost element	Cost center	Cost reason	Responsible person	Total Costs
level	subdivision	cause	Head of division	ruble
2.1.2.	Technological Department	Lecture course	A.V. Feoktistov	8618,65
2.1.3.	Brigade № 7	Input control of the tubing	A.A. Kuznetsov	1198,92
...
Total	X	X	X	9817,57

The statement submitted shall be filled in by the Planning and Economic Department (PED) employee on the basis of reports submitted by the workshop on the activities carried out for the reporting period. The user of this statement can visually see all the costs incurred by the workshop for a certain period of time. It is generated in the electronic computer in Microsoft Excel program, which enables you to use a filter system to allocate the individual cost groups. Using the classification level of cost elements will enable to quickly determine the reasons in the future and minimize them purposefully. The presence of a "person in charge" column binds each amount spent for a certain employee of the workshop, the presence of this column has the following advantages:

- There is an employee who can account for every trouble spent;
- The employee's awareness of the presence of supervision and control increases his/her responsibility;
- Depending on the event outcome, it is possible to award or de-award the person in charge.

In order to collect the costs of quality in the workshop, we suggest using the register shown in Table 4.

Table 4. Record Sheet of Cost Accounting

Cost element	Cost reason	Brigade №	Guilty person	Responsible person	Time to correct	Total Costs
level	cause	№ on the list	member of the brigade	foreman	Brigade-hour	ruble
2.4.1.	Lapel flap	3	Yakhshegulov	Kalistratov	89	355 679,6
...
Total	X	X	X	X	89	355 679,6

In order to distinguish the costs for one-time and current, we offer to divide the account "Costs for product quality" into two sub-accounts (the first level of accounting information detailing): "One-time costs for product quality" and "Current costs for product quality". The second level of the accounting information detailing involves the opening of a number of analytical accounts. So, we offered to open the following analytics for the one-time costs for product quality:

- Purchase of more sophisticated control equipment;
- Design of a new production process;
- The costs of developing a quality program;
- Improvement of the product design;
- The costs for certification.

We offer to open the following analytical positions for the current costs for product quality:

- The costs for poor quality prevention;
- The costs of quality level control;
- The cost for correcting low quality, identified in the enterprise;
- The costs of eliminating the consequences of receiving lower quality products by the consumers.

In concreteness and depth of the accounting, we offer to use one more number of sub-accounts. The structure of account 36 "Costs for the product quality" in accordance with the recommendations is specified in Table 5.

Table 5. Structure of the Account "Costs for Product Quality"

1 level	Sub-account number for accounting for one-time and current costs
2 level	Cost direction cipher
3 level	Cipher of responsibility center

On a monthly basis, the quality costs collected on the account are written off in the directions and order stipulated by the current legislation of the Russian Federation and the accounting policy of the enterprise. At the end of the reporting period, the costs collected on the 36th account are allocated to the 20th, 25th and 26th accounts in accordance with the place of origin, for example, an accounting entry: Debit 26 Credit 36.

4. CONCLUSION

The article considers managerial accounting of costs for providing and improving the quality of products, works, services.

According to the research results, we offered a classification of costs for quality, separated the analytical levels in it, and gave practical recommendations for solving the problem of insufficient work, for improving the quality of work performed, consisting of proposing the formation of a cross-functional group of specialists engaged in processing, summarizing and analyzing the information on quality costs. We developed the registers to collect the quality costs using the proposed cost-sharing structure, which made it possible to achieve cost matching and provided recommendations for their drawing up and usage. We also offered disparate data on the costs for product quality for convenience of their separate and systematic reflection, by introducing a separate active collection and distribution account 36 "Costs for the quality of products, works, services" into the plan of accounts. In conclusion, it can be said that it is controlling that enables you to order the information flow, monitor the activities of individual subdivisions, link strategic and operational levels of planning the company's activities in the quality management system.

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