

Process Approach to Transport System Management in the Conditions of Digitalization of Its Accounting Model

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Abstract: In modern conditions of economic development an increasing number of organizations face with new forms of interaction, the need to transform traditional approaches to management, the introduction of new technologies, including information. In many ways, the effectiveness of management decisions depends on the chosen approach to managing the organization. In the conditions of the digitalization of society, the correct construction and management of the organization's business process system takes an important place. The article provides the issues with the implementation of the process approach to management in transport organizations on the example of the Belarusian Railway, the issues of further digitalization of the industry, taking into account the introduction of corporate-type information systems.

1 INTRODUCTION

Currently, more and more organizations are coming to the conclusion that the maximum effect of business management will be achieved not by dividing it into separate functions, but by managing the entire set of business processes that represent the actual activities of the organization, using the experience of introducing modern information technologies in management. The development of information technologies makes it possible to apply them more and more actively in all spheres of public life, to transform economic processes. Transport, occupying a special place in the economic system of any country, is also undergoing transformation as a result of the emergence of new digital technologies. One of the clearest examples is the trend of digitalization of railway transport, which is expressed not only by the introduction of new information technologies, but also by the reengineering of existing business processes of organizations.


In the context of growing competition and digitalization of business and the global economy, rail transport must respond to market changes and provide services with high quality and maximum economic efficiency. This is facilitated by the implementation


of a process approach to management in the railway transport system of the Republic of Belarus. It is the process approach that allows system to quickly get rid of many shortcomings and solve pressing problems.

In their works, prominent researchers and scientists of the 21st century in the field of management J. Thompson, M. Porter, M. Hammer, D. Champi, V. Scheer, K. Gein, D. Harrington considered process management as the leading concept for the implementation of activities by organizations. They assumed that this concept would allow the organization to be viewed as a system of interrelated and interacting business processes, the ultimate goal of which would be the creation of products or services that have a certain value for internal and external consumers. (Scheer, 1999).

2 MATERIALS AND METHODS

Recently the concept of the “Digital Railway” is being actively implemented in the railway transport of the Republic of Belarus, which, being one of the elements of the process of digitalization of the economy, is focused on further improving the process of providing services and raising the standard of

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living. This concept is closely related to the country's policy in the field of development of digital technologies in railway transport. The creation of a digital railway is not only the introduction of digital technologies, but also physical and organizational transformations of the infrastructure.

The development of modern technologies is the driving force behind the transformation of society and the economy, as the basis of its well-being. This trend is especially clear in the field of transport. The expansion of digital technologies in transport, logistics, and the economy of the state as a whole is the driving force that allows us to achieve economic growth and the well-being of society. The trend of recent years has been the digitalization of the railway transport of the Republic of Belarus, as the basic core of the intellectual transformation of the transport sector of the economy. In this regard, the Belarusian Railway has developed tools (corresponding to national legislation and international transport law), which have been practically tested in the organization of freight traffic within the republic and in international traffic.

Railway transport is a complex production system, it is the most important transport complex of the country, providing more than 60% of cargo turnover and 30% of passenger traffic in Belarus. To date, a functional approach to management is being implemented here, however, as part of our research, we propose to transform this approach into a process approach with the identification of certain railway business processes and the development of a methodology for their accounting within an automated system. Note that the process approach is a special approach to the management, analysis and functioning of an organization, including the study of the relationship of business processes not only at the level of the internal environment, but also when interacting with external factors. In this case, a business process can be defined as a chain consisting of sequential, related and continuous operations, the implementation of which requires the diversion of enterprise resources in order to obtain measurable results that satisfy the needs of both internal and external consumers.

Since the technological process of the railway is quite specific, therefore, the same function can be an internal process that is part of larger processes and business processes, and if it is implemented externally, it can be presented as a business process. The value result of the execution of these processes is transport products (works, services) that meet the needs of customers. At the same time, each individual

process at the output should have a result that is important for the execution of the next process.

Rail transport can act both as a means of transportation designed to meet the needs of individuals and legal entities in the transportation of passengers and cargo, and also as a type of business aimed at making a profit from its activities as part of a number of operations related to the provision of the transportation process. The transportation process, which is the main activity for railway transport, is a set of transport operations aimed at the spatial movement of passengers and cargo.

A characteristic feature of the railway transport of the Republic of Belarus is the presence of two approaches to the management system: territorial and functional. The purpose of the territorial approach is to ensure the process of transportation in the regions, implemented through the railway departments. The purpose of the functional approach is the qualitative performance of each of the functions of railway transport. However, the implementation of the process approach is currently quite difficult, since the railway system of business processes has not been fully built yet.

In total, the processes and sub-processes carried out by railway transport enterprises form a single technological process of transportation. It should be noted that the transportation process is not the only business process of railway transport, so it would be inappropriate to evaluate only its effectiveness, as well as evaluate the effectiveness of any individual technological operation. It is necessary to evaluate operations, functions, procedures, processes, business processes that are aimed at fulfilling the tasks set by the management (organization of freight transportation, ticket sales, rolling stock repairs), in order to organize the coordinated work of functional units and line managers to achieve a unified business-goals. Depending on how well the management of operations, functions, procedures, processes, business processes was organized, the effectiveness of the implementation of the activities of the entire railway system, the further development of this business, as well as the preservation of competitive advantages in the market will depend.

The procedure for identifying business processes in any organization is a rather labor-intensive and complex process, therefore, in order to simplify it, when documenting business processes, certain requirements must be followed:

- identification of the business process and the definition of everything related to it, and all those involved in achieving its effectiveness;

- establishing a consumer either within the company or outside it of the product (service) obtained as a result of activities within the business process;
- the boundaries of the business process are determined not by technological or functional principles, but by the requests of the consumer-client;
- the key and most important figures in determining the boundaries of business processes are not engineers and technologists, but managers and economists (Shatrov, 2018).

According to the above requirements, when forming a process approach in the railway transport of the Republic of Belarus, its own special classification of business processes is applied. (figure 1).

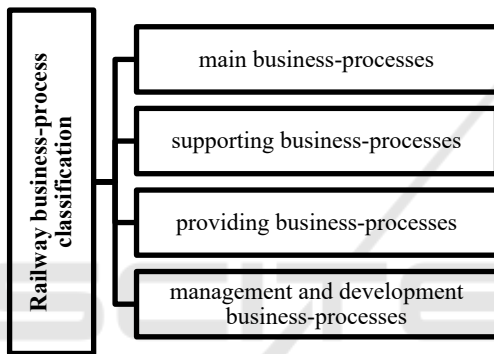


Figure 1: Railway business-process classification.

At present, the process approach in the railway transport system of the Republic of Belarus is mainly related to the description of production processes carried out by structural divisions (branches), and is implemented through the Concept of applying lean manufacturing technologies, QMS standards of the ISO 9001 series. However, it should be noted that a formalized approach or document, which would determine the business processes within the framework of the activities of the railway transport of the Republic of Belarus does not exist.

Attention should be paid to the fact that the functionality of process management in the railway transport system has not yet been fully implemented. The uniqueness of the process approach lies in its categories as “business process”, “sub-process” and “operation”, which are closely interconnected. However, here we note that a separate sub-process does not have an implementation, but can only function in the aggregate of a business process, which is subsequently implemented. From this we can conclude that only expanding the horizons of replicating the process approach, competently

building a system of business processes and managing them, taking into account all the subtleties of subprocesses and operations, will allow railway enterprises to increase the effectiveness of using its funds, maximizing all their capabilities.

To implement the concept of process management of an organization, the concept of business process management is currently used, which considers business processes as special enterprise resources that continuously adapt to constant changes, and relies on such principles as the clarity and visibility of business processes in an organization due to their modeling using formal notations, using software, modeling, simulation, monitoring and analysis of business processes, the ability to dynamically rebuild business process models by participants and software systems (Shim, 2014). Confirmation of the “progressiveness” of business process management as an approach to managing organizations is also confirmed by the fact that the need to implement the process approach is one of the principles of the ISO 9001 standards.

Many researchers suppose one of the main directions of transformation in terms of improving process management in the digital economy is the use of domestic and foreign more advanced technical solutions, not only and not so much in the field of automation of accounting processes, but in the field of management. In many enterprises, this is done unconsciously when implementing integrated enterprise information systems with advanced analytics. The effect of the digitalization of the activities of the railway will not be complete if the practical work at all levels of management does not use the capabilities of modern information technologies. It should be noted that, despite the availability of technical capabilities, there are often a number of reasons that impede accelerated development: the absence or contradiction with the current legislation, the unpreparedness of staff and management for the rapid development of IT, etc.

When managing processes and improving them, it is necessary to have tools for their improvement, one of the key requirements of which is the formation and functioning of a unified information environment and the ability for users to work together with the same information objects. Thereby the most effective tool for improving the company's business processes is information system.

The railway transport of the Republic of Belarus has its own organizational structure, terminology and approach to cost reflection. All this predetermined the need to formalize business processes within the association. Nowadays there is no document which would regulate the system of business processes of

the railway. Although there is an information system that contributes to the speedy transition to process management.

The Unified Corporate Integrated Financial and Resource Management System (UC IFRMS) is a corporate-type information system currently operating in the railway transport of the Republic of Belarus, which introduction contributed to the transition from a functional management approach to a process one. The system belongs to the class of ERP systems, has extensive functionality, is built on a modular basis and already includes a set of business process schemes that can be rebuilt to the needs of a particular structural unit, includes a set of software solutions designed to automate accounting, financial, management accounting, as well as realizing the information support of management processes. The capabilities of the system make it possible to carry out a variety of control and analytical activities, reflect and process standard business transactions, generate the necessary reports, which in the future will allow making effective management decisions. One of the main advantages of the system is the ability to integrate all the information generated in the structural subdivisions (branches) of the Belarusian Railways into a single information space, which will allow the management and employees of enterprises to make management decisions more quickly, and the modular principle of construction will ensure efficiency, safety and the efficiency of processing incoming information about ongoing business processes.

UC IFRMS allows users to quickly receive information on all railway organizations, and due to the developed control modes, already at the stage of filling out spreadsheets, eliminate the possibility of errors. UC IFRMS is based on SAP platform. The models that make up its basis have been worked out for years, therefore, we consider it scientifically reasonable to conclude that it has already implemented the proven most effective experience in implementing a process approach to managing transport systems. Therefore, an important task of adapting UC IFRMS to the national legal features and technology of transportation and financing of railway transport is to fill it with structured accounting information based on the developed system of primary documents and registration of data on costs at their places of origin.

Accounting for the railway transport of the Republic of Belarus is based on a financial model that involves the formation of financial reporting. Although currently financial reporting does not make it possible to build and manage business processes, so

the management accounting system must be rebuilt or built in a new way. The existing model of management accounting is based on the registration of costs by processes, revenues are not clearly expressed, and therefore it is difficult to correlate them with the costs that caused these revenues. Therefore, UC IFRMS allows you to reflect typical business processes so that there is no additional burden on an accountant or economist, to receive detailed information on business processes, so that it becomes possible to rebuild them on the basis of accounting data.

Thus, in the context of digitalization of the accounting system of the railway transport of the Republic of Belarus, electronic forms of data presentation are replacing paper media, and thus form a new concept – “digital event” – the moment of a business transaction, which is automatically reflected in the system registers. In this regard, there is a problem of the need to move from filling out the primary documentation in the form in which it is carried out now, to the registration of primary transactions according to the new opportunities of the developing digital economy. In further, when analyzing the flow of information received by the management of the railway from structural divisions, the top manager will have the opportunity to highlight data, identify bottlenecks in the operation of particular enterprises and make management decisions by building a “digital track” for each of the business processes. The detailing of business processes is caused in order to highlight the “digital tracks”, and thereby gain the ability to track, manage and control costs.

Thus, an active transition to process management in the railway transport of the Republic of Belarus is carried out through UC IFRMS and the quality management system (ISO 9001:2015), which allows railway to change the traditional functional approach to management to a process one, and implement a new process management accounting that will allow enterprise to build a system business process management in such a way as to evaluate the effect of each process. However, this system must first be built to adequately reflect the results in the existing modern information and analytical system. If an organization does not rethink its actions, then imposing new technology on them will lead nowhere. As soon as this system is built, it will be possible to determine the costs for each of the processes (Shatrov, 2018).

In order to assess the effectiveness of the railway as adequately as possible, it is necessary to build a management system that would cover all processes without exception, which will require the formation

of a cumbersome and information-intensive accounting system, including the use of a specific methodology, the basic basis of which would be key performance indicators (a system of process parameters, necessary to assess the level of efficiency of this process at any stage) (Efimova, 2020), which, within the framework of the railway transport system, include, for example, the volume of traffic, the average daily mileage of a locomotive, the cost of one repair, etc.

Of course, the digitalization of the railway accounting model, carried out as part of the implementation of an integrated corporate information system, should receive a scientific assessment in order to create an adaptive information support for management that can adjust to changing needs, using the tools of modern technologies and modern data processing methods to achieve the strategic goal – “creation of a digital railway”.

Taking into account the fairly wide use of the process approach in the railway transport of the Republic of Belarus, currently an information environment has been created which allows transforming traditional management accounting into process accounting, which will be part of modern management accounting built on actuarial models of analytics and contactless monitoring of the activities of structural elements and business processes.

3 RESULTS AND DISCUSSION

The currently available set of processes and information content are insufficient for making effective management decisions, since they do not describe all the processes carried out at the enterprise and do not provide complete information for the decision-making process. The reports, configured in each of the modules, have a narrow range and do not reflect information about the ongoing business process as a whole, but only cover a certain part of it. Each of the reports does not perform analysis as such, it selects data and forms it into a tabular view. On the basis of the data obtained, the head of the enterprise cannot assess the operation of the enterprise on-line without the involvement of several specialists, as well as carry out short-term and long-term planning of the financial and economic activities of the enterprise.

Further modernization of the accounting model, taking into account the capabilities of digital technologies, will, in particular, increase the speed and expand the completeness of the provision of information necessary for making management decisions at all levels of railway management, update

the data, the efficiency of their processing, form adaptive models for managing the main business processes, determining the efficiency of the entire transport system as a whole.

The next step should be the introduction of information systems that provide support for managerial decision-making through the analysis of large amounts of data and the transition to more advanced information and control systems that can independently form control actions based on cognitive technologies that form elements of artificial intelligence. For example, at the first stages, the program can be trained to recognize the objectivity of the use of certain objects used for a particular type of repair, and subsequently link the consumption of these assets with their automatic delivery based on repair plans determined taking into account the expected traffic volumes and financial capabilities of the enterprise. This example proves that the digitalization of accounting technologies helps to optimize the planning and quality of management decisions, increase the attractiveness and availability of services, as well as the productivity of personnel, embed the railway business in the developing landscape of the “digital economy” in the country and the world, save material and labor resources, and etc.

4 CONCLUSIONS

Thus, the process approach in the context of digitalization of the economy in the railway transport of the Republic of Belarus is implemented through UC IFRMS, the quality management system and the development of the concept of lean production. Although, the potential of process management and the capabilities of the implemented information system is not fully disclosed. In the context of further digitalization of the railway economy, in order to identify, describe, regulate and effectively manage business processes, it is advisable to develop methods, regulations, instructions and regulations regarding process management, as well as consider the possibilities of business process reengineering. However, for the development of reengineering, it is necessary to build models of existing business processes.

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