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FEATURES OF THE CROSS-FUNCTIONAL BUSINESS PROCESS MANAGEMENT SYSTEM

Summary. *There are a large number of modeling methods that cover and consider various aspects of a business process. A limited number of models of such*

processes allow for quantitative analysis, and only a few of them allow for the improvement of an already structured process. This article discusses and classifies the main methods of business process modeling in terms of their analysis and optimization capabilities. Companies should analyze their activities not from the perspective of individual functions or products, but with a focus on the key business processes they carry out. A similar vision is also presented for the approaches to the analysis and optimization of business processes that have been identified in the relevant literature. The main contribution of the article is that it identifies what types of business process models are suitable for analysis and optimization, and also highlights the lack of such approaches. This article offers a state-of-the-art review in the areas of business process modeling, analysis, and optimization, emphasizing that the latter two have not received sufficient coverage and support in previous research.

Keywords*: business process, management system, artificial intelligence, end-to-end process flow, cross-functional process, key performance indicator, business process quality.*

Introduction. The modern form of doing business contains many tools that help to develop, analyze, improve and maintain competitiveness. The search for internal resources leads to improved cooperation between different departments and teams, which, in a result can stimulate innovative ideas and creative approach to solving current problems. Interaction between different functional groups in the organization is facilitated by cross-functional management. Firms that effectively implement this innovation are usually more adaptive to changes in the business environment. The implementation of cross-functional management as a new business formula for successful business is the subject of this article.

Literature review. Like any practical innovation, cross-functional management is under the scrutiny of scholars of different economic schools. Taking the note that the topic is quite flexible depending on the situational and

operational position, theoretical works are mostly adaptive and one-time coverage. Among the recent most interesting works on this topic we have to mention such researches as Xiaochen Yue [1], Jennifer Tann [2], Sauer, Stefan, and Manuel Nicklich [3], Sara Sirota [4] etc.

The authors believe that in the future, the topic of cross-functional management will continue to be relevant and important for organizations in all industries, because With the proliferation of digital technologies and the growing importance of management information systems, there will be a need for cross-functional strategies to effectively use these technologies and integrate them into various business processes. Also, special attention will be paid to the development of cooperation, leadership and conflict management skills, because the development of cross-functional management will also depend on building a favorable corporate culture and effective communication between different functional units. Thus, in the future, cross-functional management will be crucial to support the successful operation of organizations in an increasingly competitive environment.

Materials and methods. While working on the presented article, the authors used various methods that helped to systematize, analyze and present information in an objective and understandable way.

Thus, in the previous paragraph, the method of literature review was presented, with the help of which an analysis of the existing literature related to the subject of research was carried out. Using the empirical method, authors can conduct their own research or analyze data collected by other scientists to confirm hypotheses or draw new conclusions. Also, the article uses the method of analysis, which allows you to consider the researched material from different points of view, highlight key facts, determine trends, and establish cause-and-effect relationships. Also, analytical methods mean the use of logic and argumentation to examine a problem and propose theses or assumptions.

In conclusion, the synthesis method used by the authors contributed to combining different sources of information or approaches to create new ideas or concepts.

Results and Discussion. Translated with DeepL.com (free version) Business Process Management (BPM) has been at the top of most lists of important business topics since 2003. Most people consider BPM to be a logical continuation of the increased interest in business processes that began in the eighties and reached its peak in the mid-nineties, when the Six Sigma, formulated by Bill Smith, business process reengineering, document management and ERP (Enterprise Resource Planning) software appeared. The number of publications about BPM increased dramatically in 2003. Because of its broad origins and the fact that several new approaches have emerged in today's BPM discussions, it is still difficult to reach a consensus on a clear definition. Business process management (BPM) is dedicated to analyzing, designing, implementing, and continuously improving organizational processes, that's why contemporary research calls for a more holistic view on the management of organizational processes. To that end, BPM is understood as an integrated set of corporate capabilities related to strategic alignment, governance, methods, technology, people, and culture [5].

The relevance of the issue lies in the fact that in today's business environment, more and more companies are facing the need to collaborate across departments and functional areas. Cross-functional processes are a key element in the development and competitiveness of organizations, as they allow for greater efficiency, innovation and the ability to respond more quickly to changes in the internal and external environment. Effective management of cross-functional processes helps companies achieve their strategic goals and avoid the risks associated with insufficient coordination and cooperation between departments. It helps ensure consistency in the vision, scope, and goals of the process across different teams and organizations.

Regarding the definition, it should be remembered that the term "business process management" (BPM) is interpreted differently by different groups of specialists. Although it is difficult to ensure uniformity in a rapidly changing practice, we can start by analyzing the different uses of the term BPM and explaining their purposes for the different groups of professionals who use the term. Business Process Management (BPM) is a form-focused business process consulting, as opposed to a functional or organizational view; it is an enterprise-wide strategy that brings together people, systems, and applications. The goal is to automate, manage, and optimize dynamic business processes that span organizations, systems, and applications to create real business value.

In recent years, attention to business processes has increased significantly, many approaches and programs have been proposed, but the promised revolutionary expected results of reengineering have not been fully realized. This has led to growing doubts about the concept itself. One of the reasons for this situation is the lack of a structured and repeatable methodology for modeling and improving business processes that can be applied systematically.

Compared to many existing modeling methodologies and qualitative analysis, business process optimization has not received sufficient attention. While "improvement" implies a qualitative approach to improving an existing process, "optimization" requires more automated improvement using quantitative performance indicators.

Experience has shown that business process modeling is key to understanding and describing their functioning. The effectiveness of this process depends on the quality of the modeling methods and techniques used. Accordingly, the quality of the model determines the level of understanding of the business process itself. And modern software products offer many different modeling methods, each with its own advantages and limitations.

The introduction of BPM systems has led to improved management of the full process cycle, from planning to sales, especially in industries such as

– retail and wholesale trade
– energy industry (oil and gas, solar energy)
– construction
– heavy industry (equipment manufacturing)
– agriculture (agro-industry)
– light industry (food processing).

In some companies, business processes have become so extensive and complex that they are no longer manageable without the support of automated tools. BPM software products were developed to provide support for large-scale business changes. And today, BPM technologies are constantly evolving thanks to advances in artificial intelligence, machine learning, and other intelligent technologies that open up new opportunities for identifying, designing, measuring, improving, and automating workflows.

There is an obvious difference when organizing a cross-functional process in firms with different organizational structures. A cross-functional process in a traditional enterprise with a linear form of management can have the form presented in Fig. 1.

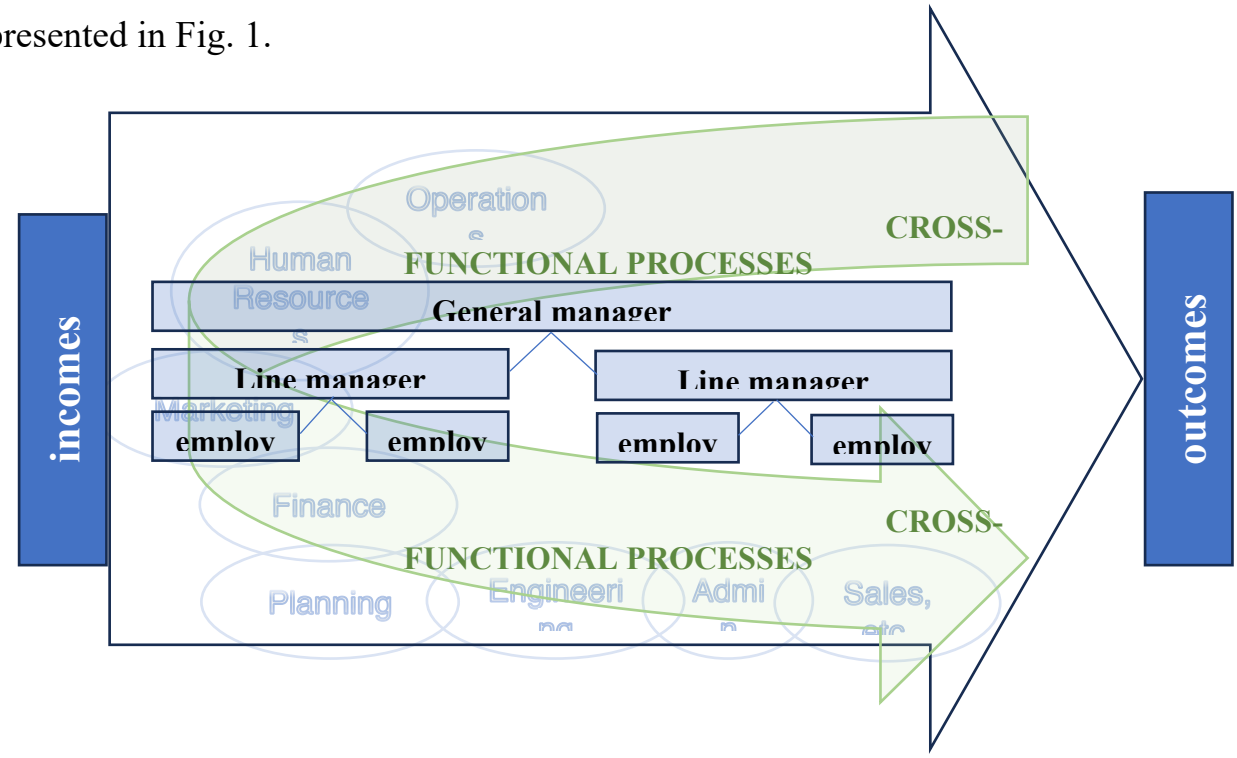

Fig. 1. Example of cross-functional process flow in line structured management

Depending on the structure of the company, cross-functionality should be organized accordingly. While in an end-to-end process, cross-functional functions are easily integrated into each individual block and quite easily accompany key operations, in a linear structure, cross-functional activities are superimposed on existing processes. This format requires more resources, including time. However, if changes are needed, linear structures remain stable and functional.

With the development of digital business, the focus of BPM has expanded from internal processes to include optimization of customer and employee interaction systems. However, the complexity of the internal organization and the uninterrupted flow of the entire range of activities within the organization should not be neglected. Companies organized in the form of vertical business units performing various functions, such as financial operations, human resources, production, sales, and marketing, require business units to access various company infrastructure services, such as databases, portals, software applications, and services based on a service-oriented architecture.

Service-oriented architecture (SOA) is a software development method that uses software components called services to build business applications. so far, SOA has proven to be a key paradigm in numerous industries such as banking, healthcare, transport, etc. Along with its many benefits, some of the identified primary studies have revealed that organisations are unable to realise the full benefits of SOA adoption because of several reasons. To fill this gap, we believe that it is vital to investigate the significant factors of SOA adoption in organisations because an understanding of these factors would help these organisations maximise the benefits of SOA implementation [6]. Each service provides business functionality and can interact with other services on different platforms and programming languages. Developers use SOA to reuse services across different systems or to combine several independent services to perform complex tasks.

SOA has several advantages over traditional monolithic architectures, where all processes are performed as a single unit:

1. Reduced time to market: developers reuse services across different business processes, which saves time and costs. With SOA, they can create applications much faster than writing code and integrating it from scratch.

2. Efficient maintenance: It is easier to create, update, and debug small services than large blocks of code in monolithic applications. Changing any service in SOA does not affect the overall functionality of the business process.

3. Improved adaptability: SOA adapts better to technological progress. It is possible to modernize your applications efficiently and cost-effectively, for example, to use the functionality of older systems in newer cloud applications.

As a result, the processes that bring real value to the company are those that span multiple organizational areas, IT systems, and applications. Typically, these processes are disconnected when moving between departments, as it is difficult to track and manage them as they move from one department to another. Therefore, companies need a more holistic and integrated approach to defining and managing business processes. Therefore, a business process is viewed as an organizational unit that covers different areas and is managed as a single process, rather than as a set of separate tasks in different organizational units. The low efficiency of a company does not depend on the mistakes of one person, but rather on the overall organization of work.

Two such processes are designed specifically to address inequalities in business process management. The first one is the so-called End-to-end (E2E) process flow – end-to-end processes, i.e., the execution of work from the very beginning to the end: actions, the order in which they are performed, the circulation of documents, and other things necessary to achieve the required result. Unlike other forms of management, which can be aimed at individual components or functions, end-to-end testing checks the interaction and cooperation between all components of the system. The main goal of E2E process flow is to make sure

that the system works correctly in real-world conditions and that the system functionality is integrated properly.

The focus of our study is on another, similar approach that is synonymous with end-to-end processes, although not equivalent, and is defined as cross-functional processes. Cross-functional processes are a set of functions of a business process without detailing by type of work or operation. It is clear that cross-functional processes are processes that involve different departments and organizations, and therefore, they can create significant value, innovation and efficiency, but also lead to challenges and risks in the process of planning them.

Cross-functional processes can be a very broad concept and have many modifications, depending on the scope of the application, and especially on the purpose of use. In terms of content, they should be absolutely synergistic and include interaction between employees of separate structural units of the company itself, personnel of different companies that are able to perform a common task, cooperation between the company and counterparties within one End-to-end process flow.

The organization of an effective cross-functional process is a resource-intensive process and requires careful planning, although the work can be carried out without interrupting the existing process. Before starting to create a cross-functional process, it is important to clearly define the scope and purpose of the project. You need to find out what problem needs to be solved, how many problematic issues there are, what goal you are pursuing, or what specific result you want to achieve. In addition, it is necessary to understand who the stakeholders are, what roles they play, their responsibilities and expectations. It is also important to determine how the success of the process will be measured and to establish key performance indicators (KPIs) and milestones.

Particular attention should be paid to the selection of the specialists involved, as a cross-functional team is a team consisting of representatives of different functional units and sub-processes that may sometimes compete. In

addition, different subprocesses-divisions have different sets of competencies. But, in general, they should all be united by a common task to achieve maximum synergy.

Recall that a subprocess is an integral part of the main process designed to perform a specific function in the process of creating the final product, but is not able to ensure its creation on its own. Therefore, the preliminary formation of the correct process architecture is of particular importance. Process flow includes the sequence of steps and decisions that make up a process from start to finish. The process structure describes the organization and coordination of people, teams, and organizations involved in the process, with their roles, responsibilities, and means of communication. Developing a process flow and structure helps to optimize the efficiency, effectiveness, and quality of the process, and ensures mutual understanding and alignment among participants.

Here it is worth recalling the concept of business process quality, which can be viewed as a set of properties and characteristics of sequentially linked processes that have specific inputs and outputs, transform resources to obtain a final product or result, and create value for external customers and their needs. These characteristics arise from the interaction between the previous and subsequent links, as well as all stakeholders, and their level allows to meet various socio-economic needs that are constantly changing. As a reminder, modern companies usually use two approaches to managing the quality of business processes:

1) a function-oriented approach, which focuses on the organizational structure of the company, involving the management of activities by structural elements, and the interaction of the latter through the work of responsible persons;

2) process-oriented approach, which considers the stages of business process quality management as a set of processes. The use of the process-oriented approach is complicated by the fact that it often lacks target benchmarks that provide the necessary conditions for the business process. This requires creating

high-quality conditions for the functioning of a cross-functional business process and managing the parameters that characterize the desired conditions.

Often, the requirements for the quality of business processes and their results are formed by an external customer. This determines the company's goals, the results of individual business processes, and the resources required to achieve the goals and implement the business processes. It is also important to identify the company's existing business processes, describing their input and output flows, defining the technologies of execution and establishing the rules of operation. In Service Oriented Architecture, the fundamental components are the services that applications are built upon. A collaborative application can then be built based on these basic collaborative services and on other selected services. They can be either an application or an orchestration of services [7].

During the process development, implementation, and monitoring, it is important to actively interact and collaborate with all stakeholders. Communication plays a key role in ensuring the exchange of information, feedback and ideas between participants through various channels and methods. Collaboration involves joint efforts and contributions from participants using a variety of methods and tools. Communication and collaboration help build trust, engagement, and alignment among teams and organizations, and foster a culture of learning and improvement.

Once the scope, participants, and goals are defined, the next step is to map the current and future state of the cross-functional process. While the current state describes how the process is currently working, with all its elements, such as inputs and outputs, steps, resources and constraints, the future state reflects the desired outcome of the process after improvement, with all the changes, benefits and risks. This conditional mapping of the previous and future states helps to identify gaps, opportunities, and relationships in the process, as well as to plan the actions and resources needed to achieve the desired result.

The map visualization facilitates the use of the theory of constraints, a methodology that helps companies optimize the use of limited resources. This approach includes five steps. First, identification of the limited resource, which is the bottleneck. Second, optimizing the use of this limited resource. Third, subordinating all other resources to this bottleneck. Fourth, increase the efficiency and capacity of this bottleneck. And finally, repeating the steps for a new bottleneck that may arise.

This last step is important because modeling or mapping business processes may not be sufficient without further analysis and validation of the models themselves. Likewise, process analysis may be of limited value if it is not aimed at improving or optimizing the business process as a whole. In particular, process improvement can be achieved with the help of appropriate formal methods that support both business process modeling and analysis.

Conclusions. A holistic approach to managing cross-functional business processes should include business process modeling, provide tools for identifying bottlenecks and analyzing performance, and create alternative improved business processes based on the identified goals. However, as already mentioned, the last part of the process optimization is often overlooked or underestimated in the business process literature.

After defining the flow map and process structure, it is important to implement and control the cross-functional process. Implementation means carrying out the process in accordance with its design, using all the necessary resources, tools, and systems. Monitoring involves collecting and analyzing data on the effectiveness and results of the process using defined key performance indicators (KPIs) and milestones. Implementing and monitoring the process helps to evaluate results, identify problems and make necessary adjustments.

Finally, it is important to periodically review and improve the cross-functional process. Review involves analyzing and evaluating the effectiveness of the process, its results and impact, using data and feedback collected during

monitoring. Improvement involves identifying and implementing changes and improvements to the process based on the findings and recommendations from the review. Reviewing and improving the process helps ensure that it is relevant, effective and efficient, and delivers value, innovation and customer and stakeholder satisfaction.

Thus, the modern business process has significantly departed from the traditional format of functional internal or external interaction and moved to the formation of cross-functional processes that can ensure a company's sustainable competitive advantage. Of course, the resource intensity of the transition to a cross-functional form of organization makes reorientation difficult, especially for small and medium-sized companies. However, the tools available today offer a fairly wide range of tools - from optimizing communication or corporate email programs for companies with a limited budget to specialized, highly specialized software designed for specific tasks of a particular company. This gives conviction and an objective understanding of the right choice for those firms that have decided to engage in a cross-functional process.

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