

IMPLEMENTATION OF THE PROCESS APPROACH AND BUSINESS PROCESS MANAGEMENT CONCEPT IN CROATIAN SHIPYARDS

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Abstract:

Today's standard Croatian shipyards are faced with major problems of the globalized shipbuilding market, whose main feature is an exceptional competition with great cost pressures. Therefore, this paper aims to explore a new model based on the implementation of the process approach and business process management concept in modern shipyards, as one of the possible answers to these market demands. The existing shipyards can be seen as very complex, huge and inflexible business-production systems. Regarding the organizational aspect, they are very “wide” and “deep” structured, which results in relatively weak effectiveness. Business processes represent a key role in forming the optimal organization of modern enterprises. In this paper we propose implementation of the process approach in the shipbuilding industry of Croatia, as the first step to achieve profitability, to define the forms of ownership and to achieve rationalization of operations, in order for shipbuilding to become the major foundation for the development of Croatian economy. The main result of this paper *refers to business process management* concept which enables Croatian shipyards to discover, document, automate, and continuously improve business processes to increase efficiency and reduce costs.

Keywords: global market, competition, process approach, business process management, Croatian shipyards.

1. INTRODUCTION

Shipbuilding in Croatia is an important industry with long tradition and is generally export - oriented. Shipbuilding affects not only the country's balance of trade and employment, but also the entire economy. Because of its great impact on the economy, shipbuilding enjoys a certain political and economic support worldwide. As other sectors of industry don't have such treatment, in Croatia however the aid is limited and focused on achieving profitability. For manufacturing and equipping the ship, a few hundred to several thousand different materials, parts, equipment, etc. are needed, all of which could possibly be produced in the local factories and crafts. The main problem of the Croatian shipyards refers to international competitiveness, which should be reached due to the natural potential which they have, and the quality of ships.

The basic research target of this paper is to analyze the impact of process approach on the productivity. Business processes can be described as series of logically related activities that use resources of the company, its main goal being satisfying customers' needs for products or services of adequate quality in an adequate period of time, while simultaneously achieving some value (Grover, Jeong, Kettinger & Teng, 1995). In terms of global market competition, enterprises can achieve a competitive advantage only by offering cheaper and better quality products and services, but effective and innovative business processes are what is required for the realization of such goals. Observation of the company through the process provides the authentic image of business. Therefore, it is important to monitor business processes and predict and manage their dynamic changes, all in accordance to gaining greater efficiency and better quality of either products or services. By simulating a business process, dynamics and behavior of the process are being analyzed in a variety of default conditions, especially when many intertwined parallelisms are present in their performance. A business model can be used for easier introduction of ISO certification and is an excellent base for computerization of business, whether by buying or developing solutions. In the case when business model is developed, IT solutions that are to be applied here are all in function of enabling efficient operations. Individual processes rarely occur alone. Outputs from one process usually present inputs to the next process (Harrington, 1991).

According to their features, shipyards are included in very complex business and manufacturing systems. This complexity is the result of the complexity of the final products - the vessels, the individual products with high capital values, being of different types and sizes. Such a complex product entails an equally complex process of shipbuilding, which requires a unique and special organizational structure of shipyards. Since shipyards simultaneously perform the activities on several locations, dealing with the various stages of construction or preparation for construction, a complex matrix - project organizational structure is the dominated one.

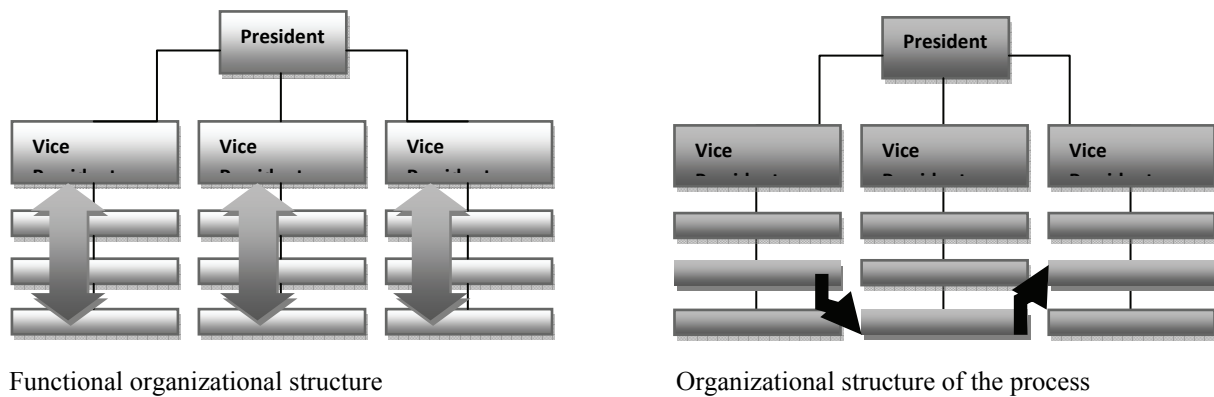
2. PROCESS APPROACH AND BUSINESS PROCESS MANAGEMENT CONCEPT

2.1. Business process approach

The process orientation is the fundamental change in the perception of the organization and represents a decisive shift away from traditional vertical - hierarchical view of the execution of tasks, in relation to the view that emphasizes the horizontal connections between functions

(Feldman, 2000). Picture 1 shows the traditional view of the organization and contemporary business reality.

Picture 1: The traditional view of the organization and contemporary business reality

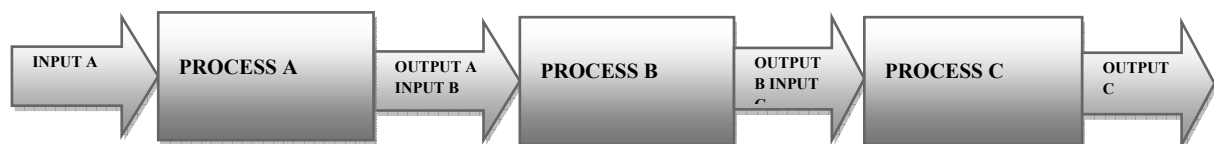


Source: Feldman, 2000, p. 77.

The difference between the functions and processes can be interpreted as the difference between whole and part (Mabert, Soni & Venkataramanan, 2003). The function here is a unit of work, the business activity that is usually performed by a group of people or even one person. The process, on the other hand, is a group of related tasks (functions) which together realize a specific value for a customer. Inherited organizational structures and business methods require a place for improvement within their own organizational sectors, departments, etc. Customers and suppliers in such a context have a secondary role. The modern business reality is different. Customers and suppliers "have their own name" and the mutual task of everyone in the organization is to fulfill their role in the optimal way, in order to satisfy the customer.

One of the eight principles underlying the ISO 9000-2000 standard is applicable to the process approach. Standard 9000-2000 defines process as: "a set of interrelated or interdependent actions that transform inputs into outputs ", where inputs from one process are frequently outputs from other processes. The process must be assigned with the appropriate resources, so that it could happen. Picture 2 shows the chain of interrelated processes.

Picture 2: Chain of interrelated processes



Source: Harrington, 1991, p. 98.

ISO 9001 emphasizes the importance of establishing the organization, implementation, management and continuous improvement of the effectiveness of the processes that are necessary for quality management system, and for managing the interaction of those processes to achieve organizational goals. Applying the principle of process approach typically leads to:

- Systematically defining the activities necessary to obtain a desired result.
- Establishing clear responsibility and accountability for managing key activities.

- Analyzing and measuring of the capability of key activities.
- Identifying the interfaces of key activities within and between the functions of the organization.
- Focusing on the factors such as resources, methods, and materials that will improve key activities of the organization.
- Evaluating risks, consequences and impacts of activities on customers, suppliers and other interested parties.

2.2. Business Process Management

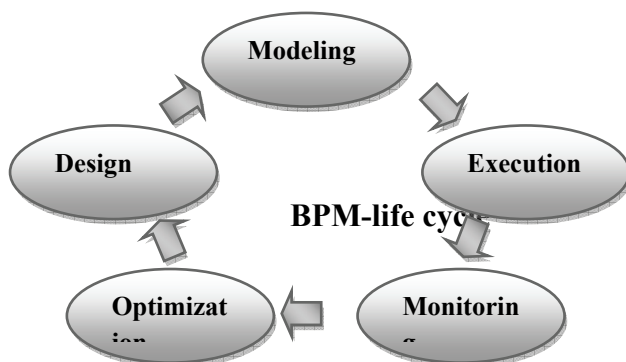
Business process management (BPM) is a systematic approach to improving an organization's business processes. It is focused on aligning all aspects of an organization with the wants and needs of clients. BPM makes an organization's workflow more effective, more efficient and more capable of adapting to an ever-changing environment.

Business process management attempts to improve processes continuously and considers them to be strategic assets of an organization that must be understood, managed, and improved to deliver value added products and services to clients. BPM is an approach to integrate an organizational "change capability" that is both human and technological. Because BPM allows organizations to abstract business process from technology infrastructure, it goes far beyond automating business processes (software) or solving business problems (suite). When beginning BPM, it is important to realize that processes vary greatly. Processes can be categorized in many different ways, including:

- Complexity
- Duration
- Volume
- Industry
- Department.

The reason why this is important is because some types of processes are not well-suited to being managed within BPM software. For example, while highly repetitive or regulated processes tend to be excellent candidates, highly unpredictable and unstructured processes are not. As mentioned above, business process management is a discipline consisting of 5 phases: design, modeling, execution, monitoring, and optimization. Picture 3 shows business process management life-cycle.

Picture 3: Business process management life cycle



Source: Miles & Snow, 1986, p. 72.

- Process Design encompasses both the identification of existing processes and the design of "to-be" processes. Good design reduces the number of problems over the lifetime of the process.
- Modeling takes the theoretical design and introduces combinations of variables.
- One of the ways to automate processes is to develop or purchase an application that executes the required steps of the process; however, in practice, these applications rarely execute all the steps of the process accurately or completely. Another approach is to use a combination of software and human intervention; however this approach is more complex, making the documentation process difficult.
- The Monitor Phase is where process performance is measured.
- Process optimization includes retrieving process performance information from modeling or monitoring phase; identifying the potential or actual bottlenecks and the potential opportunities for cost savings or other improvements; and then, applying those enhancements in the design of the process. Overall, this creates greater business value.

The most significant BPM advantages are: Efficiency, Visibility, Control, Flexibility, Speed, Production Management, Performance Management and Resource Management.

Business process management solutions can be divided in two basic categories: Front-Office BPM (FO-BPM) and Back-Office BPM (BO-BPM).

- The FO-BPM solutions provide capabilities for person-to-person processes in which "work items" are created and routed along with any attached documents.
- On the other hand, the BO- BPM solutions enable system-to-system integration in which a single process may rely on multiple external processes to complete its work.

Front-office- and back-office-oriented BPM systems are aimed at different problems. For example, front-office BPM applications typically involve transactions that are "short running." Managing the transaction context of a process involving multiple resource managers requires an alternative approach in BO-BPM.

3. IMPLEMENTATION OF THE PROCESS APPROACH AND BUSINESS PROCESS MANAGEMENT CONCEPT IN SHIPBUILDING INDUSTRY OF CROATIA

At the first level, the whole process of shipbuilding is divided into the preparatory processes of the shipbuilding and of shipbuilding production processes.

By analyzing all of the shipbuilding processes at the third level and using the methods of classification and comparison of data, the only conclusion would be that one group of the processes extends to the entire shipbuilding process, the other group only to the preliminary part of the shipbuilding process, while the third group extends only to the manufacturing part of the Naval process.

Implementation of the process approach will be shown in the next example where real shipbuilding process is applied and divided into three parts:

- Processes related to the entire shipbuilding process are applied and divided into: process development, process management, financial - accounting process, the process of managing human resources, general administration process, and process assurance and quality control (QA / QC).

- The processes that are related only to the preparation of the shipbuilding process are applied and divided into: the sales process, process design, construction process, technological process, procurement process and process of storing rack material.
- The processes related to the production of the shipbuilding process are applied and divided into: relationships with partners process in manufacturing, steel processing, the process of composition of troops, the process of assembling troops, the process of letting the vessel into the water, the process of equipping the vessel, the process of corrosion protection, manufacturing processes, process support, process and maintenance of capital goods.

It can be concluded that on the third level of shipbuilding process there are three groups of processes: on the level of the entire shipbuilding process there are six processes, on the level of preparation of the shipbuilding process there are five processes and on the level of production of the shipbuilding process there are eight processes. These processes will be further subdivided into basic or key processes, those that are directly involved in the preparation or construction of the vessel, and to the supporting processes that have the function of supporting the primary processes and are indirectly involved in the preparation or construction of vessels. Based on the analysis above, it can be concluded that the shipbuilding process at the third level consists of nineteen processes. These processes will be furthermore, divided into a total of 91 sub-processes, which tells us about volumes, the size and the complexity of the shipbuilding process in general.

From the example above it can be concluded that by analyzing the process and applying the process approach to the shipbuilding industry, the productivity of labor, the efficiency and profitability will be increased. This type of change in shipyards will strengthen competitive advantages for the Croatian shipbuilding companies. Transparent and properly lined business processes accelerate the company's work, help managing costs, and also contribute to the internal order and improvement of the quality of products / services. Ultimately they affect the overall organization, in such a way increasing business efficiency (Miles & Snow, 1986).

A process consists of multiple activities (also known as "steps" or "tasks"). These are created and linked to each other to form the flow of the process. Conditions that define how and when an activity must be called are also defined during the modeling phase. The activities within a process either require human involvement or are processed without any human interaction. Therefore, the modeling tool needs to support person-to-person and system-to-system processes.

Today's BPM systems manage processes that include person-to-person work steps, system-to-system communications or combinations of both. In addition, BPM systems include integrated features such as enhanced process modeling, simulation, code generation, process execution, process monitoring, customizable industry-specific templates and out-of-box integration capabilities along with support for Web-services-based integration. All of these ingredients translate to increased interest today in BPM suites because they bring businesses a higher level of flexibility for business processes while reducing risks and cost.

There are 6 things to look for in determining the business process management suites that are right for shipbuilding industry in Croatia:

1. Business process management systems are especially good for processes in which all activities are predetermined in order. Shipyards should validate the business value of taking a BPM approach and document the detailed activities of their processes.

2. The next activity they should do is to consider the type of BPM solution needed: front-office-oriented BPM, for human-centric processes, or back-office-oriented BPM, for integration centric processes. It's possible that their environment may benefit from both types of BPM.
3. Then, they should refer to the BPM lifecycle activities and architectural components covered earlier and analyze how their requirements are supported, in detail, by the prospective products. Afterwards they should take their product selection based on the total value of the BPMS.
4. For front-office-oriented BPMS, ease of customization and out-of-box support for integration should be high on their list.
5. It's important to pay more close attention to the vendor's direction among back-office-oriented BPM suites. Croatian shipyards should also consider the vendor's support message transformation, routing and multiple-transport protocols.
6. Finally, the last issue Croatian shipyards may want to consider is how rule engines are used in the BPMS. Rule engines are an optional component in most BPM suites.

4. PLANNED ACTIVITIES

The research described in this paper will lead to privatization of Croatian shipyards, where managers should improve the mechanisms for managing changes in the company, supported by an increased willingness for change.

The future research plan after applying the process approach and business process management concept is the implementation of e-business as the most important part of the business infrastructure.

The next step will be the distribution of knowledge which should be implemented at lower levels of the organization, shifting the transfer of responsibilities to each employee, which would also include measuring the success of individual employee.

5. CONCLUSION

This study is to analyze the impact of applying the model of process approach and BPM concept in the shipbuilding business, which wouldn't be possible without the simultaneous development and application of new technological advances in the methodology of construction of vessels. In addition, full implementation of production engineering is required.

The application of high technology in a larger part of the shipbuilding process would result in a time overlapping when it comes to constructing hull and outfitting the vessel.

Complex research conducted in this study confirms the existence of the association and the impact of applying the process approach to shipbuilding activities to the increase of business efficiency of the shipbuilding industry in Croatia.

Implementation of the process approach and business process management concept will help Croatian shipyards to develop new business models to drive increased revenue growth, cost reduction, and improve business agility to rapidly respond to events in the business environment.

Results of the transformation of Croatian shipyards applying the model of process approach and BPM concept show that using the new model opens up the possibility of increasing the

business efficiency of shipyards, which is primarily, reflected in reduced number of employees and the increased production volumes.

In consequence, the productivity, as one of the most important elements of competitiveness and success of a shipyard, will significantly increase.

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