

ADMINISTRATION OF BUSINESS PROCESSES OF A MANUFACTURING ENTERPRISE

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Introduction. The operating system of any enterprise is one of the key factors of success of the enterprise, which allows you to turn all available resources into the desired finished result (product or service) for the client. The development of globalization and scientific and technological progress has led to rapid changes in the production of various products, and in the process of use, consumers have demonstrated new functionality of certain groups of goods. At the same time, over the past two decades, the types of production that are traditionally used have not changed significantly, but on the contrary have expanded their capabilities through the improvement of objects and means of labor. The automation of individual production sites has expanded not only the opportunities but also the economic potential of individual sectors of the economy. All this has become available due to the development of not only technology but also the competencies of production staff and a scientific approach to the organization of all processes.

Overview of recent researches and publications. The essence of business processes and methods of their management are reflected in the scientific achievements by domestic and foreign experts: O. Vynohradova, V. Yeliforov, M. Crisper, D. Repin, M. Robson, V. Ilyin, J. Harrington, M. Hammer, D. Champy, L. Chornobai, etc., but some aspects are not detailed and require research taking into account the specifics of the enterprise and business practices.

The main body and results of the research. The purpose of the article is to study the theoretical and practical aspects of the process of administration of production processes in order to improve the efficiency of their management.

In conditions of competition, the requirements increase not only for staff but also for the management system, which is transformed into professional management (involving not only the implementation of tasks, but also the achievement of goals and the rational use of all resources). However, in recent years, increasing requirements for the quality of functional tasks and the need for their optimization in all departments, are structural units of the enterprise. Therefore, the administration of a manufacturing enterprise involves streamlining all material and information flows in the enterprise in order to make a profit and create the conditions for sustainable development. The business process management in the enterprise is an approach to management, which focuses on optimizing the implementation of business processes in organizations. Thus, Davenport (1993) defines a (business) process as a structured, measurable set of measures designed to produce a specific product for a specific customer or market [5]. This implies a strong emphasis on how the work is performed within the organization, as opposed to the product's emphasis on what is being done. Thus, the process is a specific ordering of work activities in time and space with a beginning and an end and clearly defined inputs and results: a structure for action. Adoption of a technological approach means acceptance of the customer's point of view. Processes are the structure through which an organization does what is necessary to gain value for its customers. And a business process is a complete, dynamically coordinated set of activities or logically related tasks performed in order to deliver value to customers or achieve other strategic goals [1]. From this point of view, business process management can be defined as all the efforts of the organization to analyze and continuously improve the main activities, such as production, marketing, communications and more. Thus, business process management is a comprehensive approach to the implementation of efficiency and effective business processes in the organization.

The essence of process control is reflected by the model of its phases. These phases include the appropriate implementation, the necessary steps in the development (or description) of implementation, automation and determination of process performance. Each business model in the enterprise contains certain elements that are displayed in a certain order and affect its overall management system. The purpose of business process management is to increase the efficiency and effectiveness of organizational processes through improvement and innovation. The main elements of business processes are as follows (Table 1).

Table 1

**The main elements of the business process at the manufacturing plant
(compiled by the authors [12])**

Element	Characteristic
Offer	set of products and services of the enterprise
Target customer	Customer segments to which the company wants to offer value
Customer service / distribution	A variety of enterprise tools to connect with your customers
Customer interfaces / relationships	The types of relationships that a company establishes between itself and different customer segments
Configuration / value	Organizing activities and resources
Ability / core competence	Competencies required to implement the business model of the enterprise
Affiliate network	A network of cooperation agreements with other companies necessary for effective supply and commercialization of value
Cost structure	Financial results of funds used in the business model
Income model	The way a company makes money through different revenue streams

There should not be many processes. Singh R. emphasizes that a typical organization should have less than 15 key processes, which will depend on the level of business activity, industry or purpose of the organization. At the same time, business processes are necessary if an enterprise wants to be competitive in the market, because the identification of business processes ensures success. Identifying key processes through a structured approach, aligning their results to achieve business goals, developing appropriate measures and allocating sufficient resources to improve them is the key to the success of the organization [13].

The turbulence of environmental factors has created a need for dynamic business processes, so companies are looking for business processes that can evolve and effectively adapt to changing conditions and changing business strategies. Because the effectiveness of the organization depends on the team, the ability of their business processes to achieve their main goals and they are central to achieving high-performance organizations.

For the first time the study of business processes in the operating activities of the enterprise was proposed by Olshanskyi O.V. [12], which identified: the processes of material and technical supply; production process (service provision); product sales process; settlement process with buyers and customers. However, Parasii-Verhunencko I. suggested that the analysis of operating activities focus on marketing, production process, cost analysis and analysis of enterprise capabilities [10]. This problem is not yet explored in domestic practice and science. Thus, to highlight the business processes in the enterprise and the formation of their model in software products for the formation of automated control systems use a set of eight business processes that define the full range of activities that the firm is engaged in its business. Within these processes, there are business functions that describe in detail the specific activities that the company carries out in order to produce its goods, provide services or otherwise achieve its goal. Processes begin with the purchase of materials and end with services provided after the sale of goods or services. Eight processes are grouped into core business processes and support business processes.

The main business processes are most directly related to the main activities of the enterprise, with operations taking into account industry activities. Business process support contributes to the main business processes of the enterprise (Fig. 1).

When the main process is implemented, only individual actions can be changed to increase its efficiency, but the sequence cannot be changed. Therefore, when the main business process states that certain tasks need to be performed consistently, this should be taken into account during implementation. Thus, all the identified steps related to the task should also be reflected within the implementation. In particular, the business process "production" should include the following types of work: organization of work to ensure

product quality, organization of logistics, organization of comprehensive production preparation, organization of production processes for the production of basic products, organization of production infrastructure of the enterprise (tool economy, energy management, warehousing, organization of repair service, etc.).

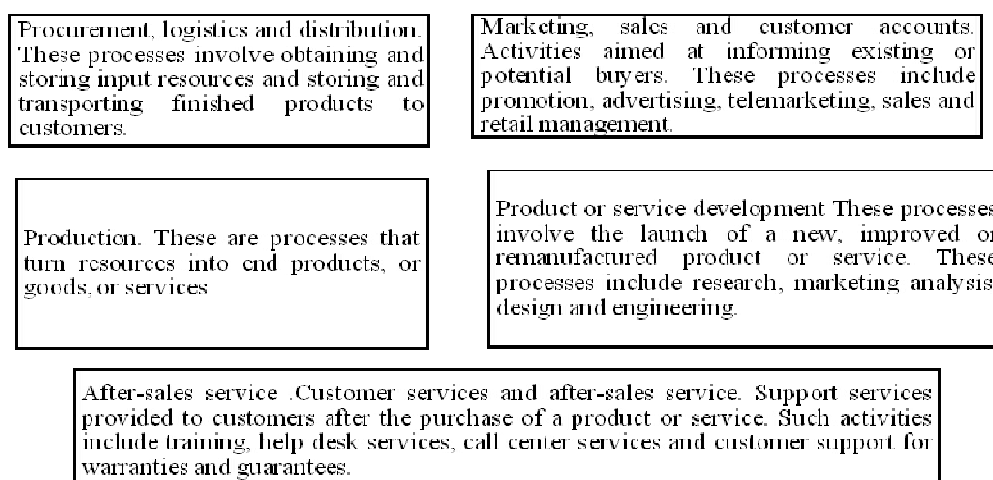


Fig.1. The main business processes of a manufacturing enterprise (compiled by the authors [10-12])

In particular, if we consider the essence of the production business process of the enterprise at the operational level, it will be characterized by 11 types of mandatory work (fig.2).

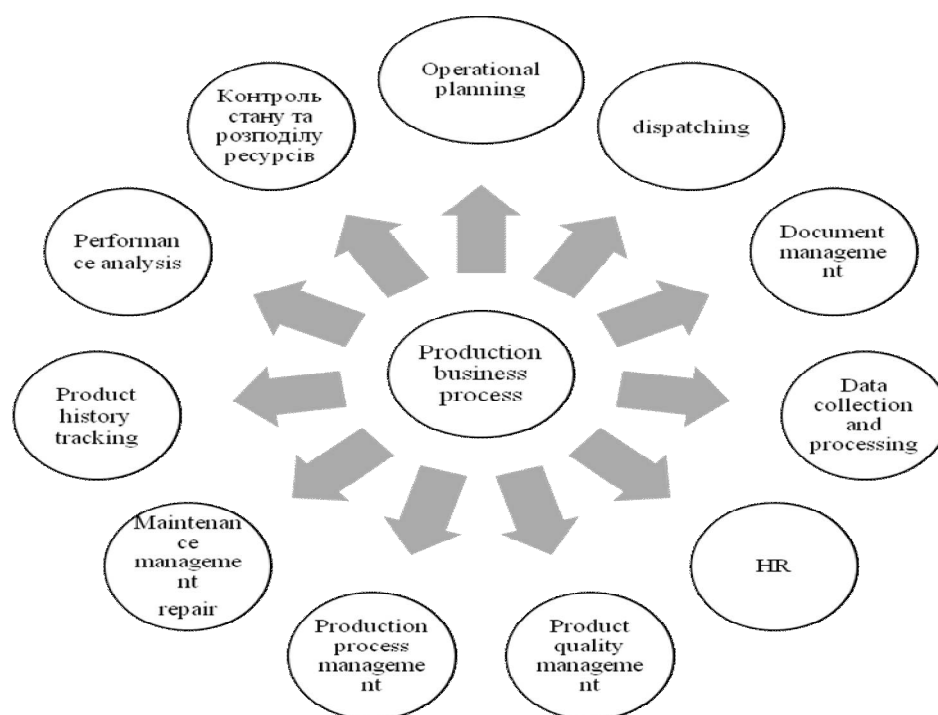


Fig. 2. The structure of the production business process, which is used in automated production management systems (compiled by the authors [3])

Thus, after analyzing of scientific literature, we found that the same opinion about the main business processes and some authors suggest the main business processes to complement the strategic management (business process). This process is carried out at the highest management level. It includes the formation, implementation and evaluation of cross-functional solutions, which allows the organization to achieve long-term goals. These processes include: coordination, development and investment. Polonsky S. proposes to distinguish 7 types of business processes (fig. 3).

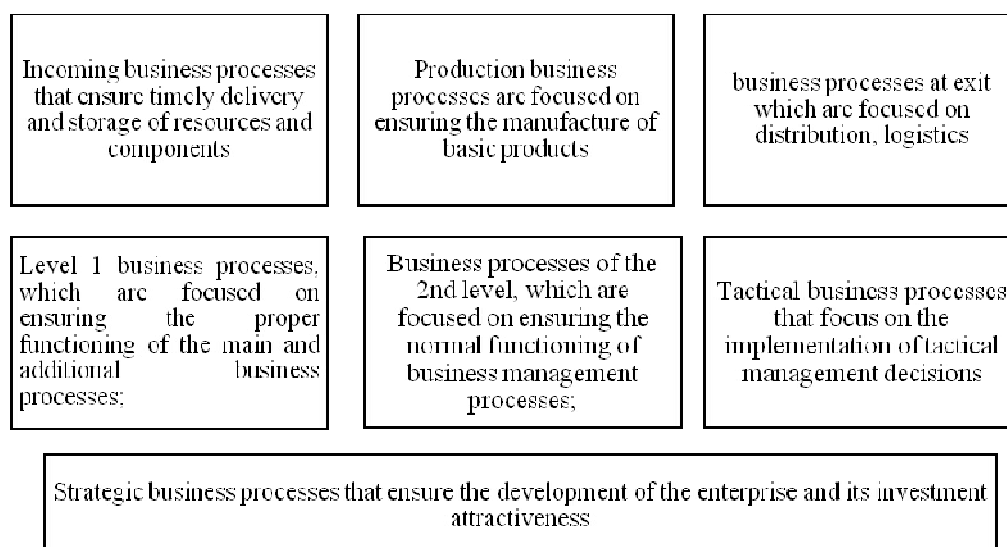


Fig.3. Seven main business processes of the enterprise (compiled by the authors [6])

For their implementation at the enterprise it is also necessary to implement business support processes (fig.4).

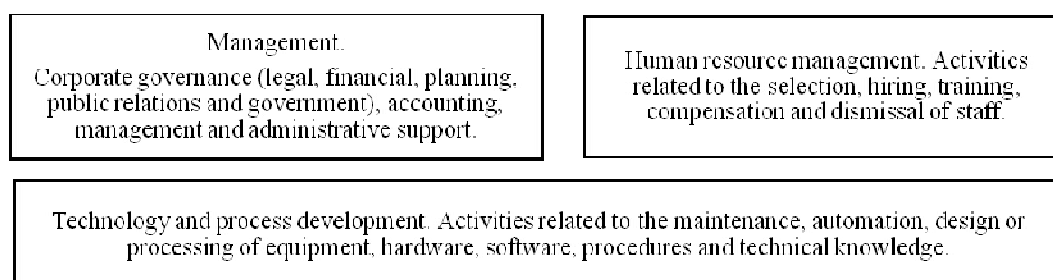


Fig. 4. Supporting business processes of a manufacturing enterprise (compiled by the authors [6])

Let's consider in more detail. The human resource management (business process) can be represented as follows (Fig. 5), which includes a number of mandatory types of work.

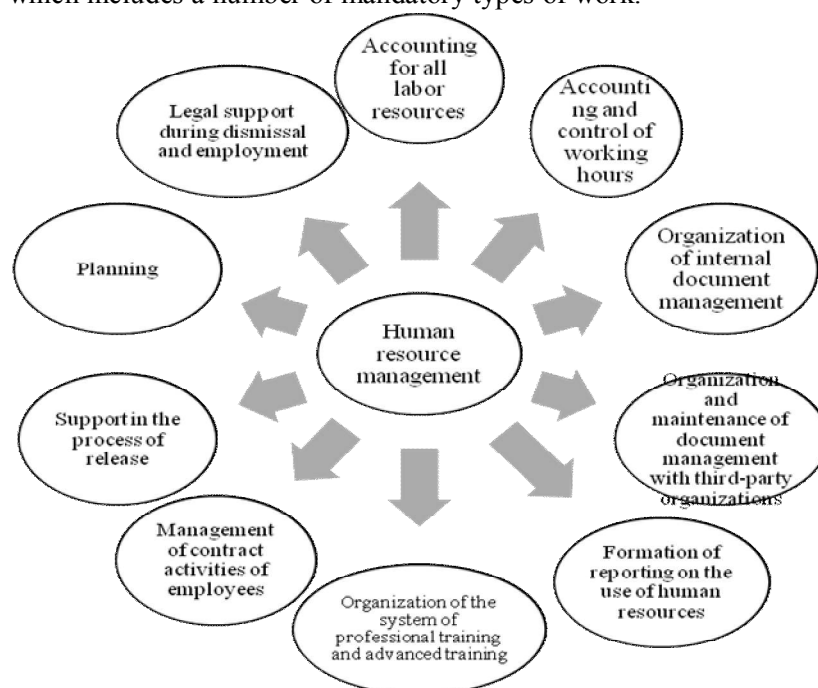


Fig.5. The structure of the business process of human resource management in a manufacturing enterprise (compiled by the authors)

The next business process is general management (Fig. 6).

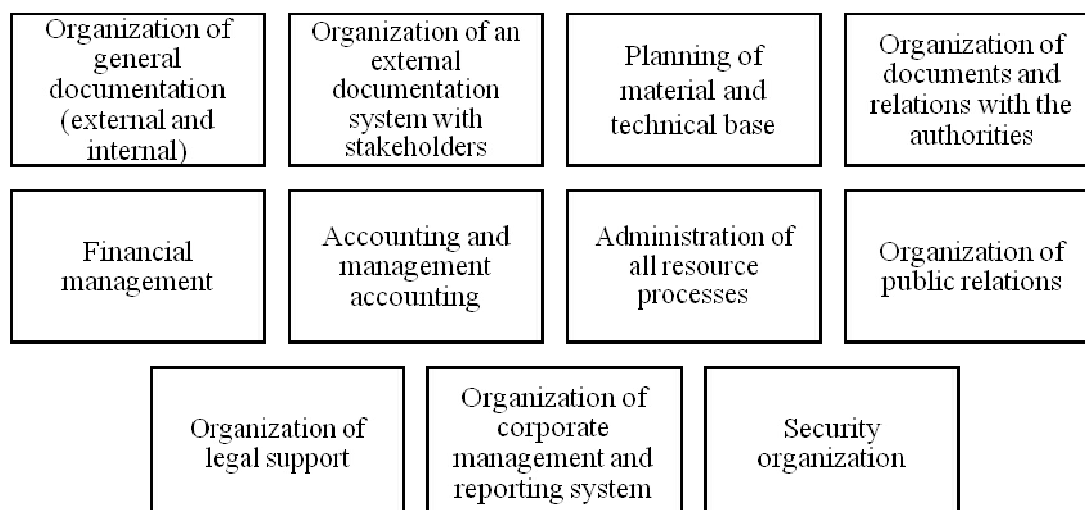


Fig.6. The main activities that are included in the business process of general management (compiled by the authors)

The next business – process – technology and process development (Fig.7).

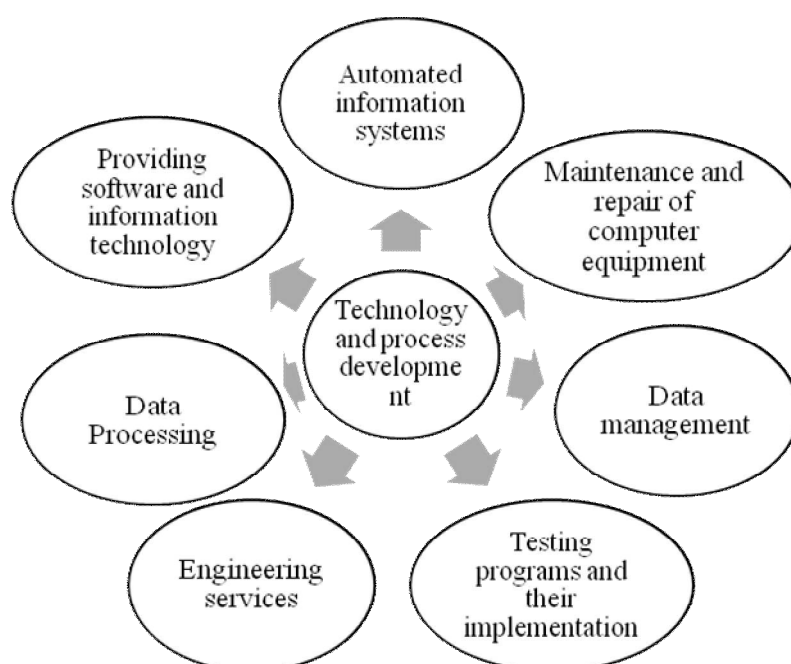


Fig.7. The main activities that are included in the business process technology and process development (compiled by the authors)

Thus, business process management of a manufacturing enterprise contains three main components: methods and concepts that allow to evaluate the effectiveness, establish evaluation criteria and conduct analysis;

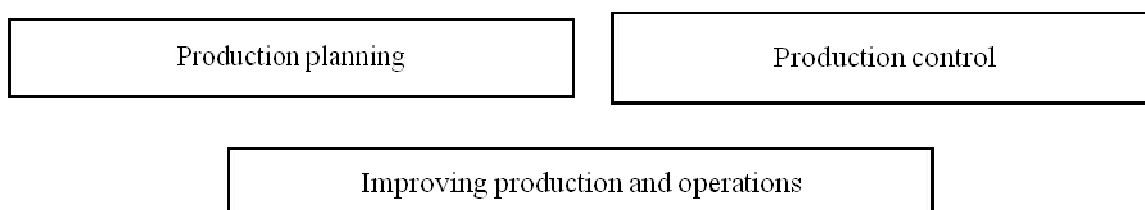
process management life cycle: process identification (compiling a process map, determining process parameters and internal structures), process measurement (setting the process performance indicator, determining the desired value of the indicator, measuring the achieved value), process improvement;

process management principles: integrity principles, ownership (each process has an owner responsible for efficiency and continuous improvement), documentation (all processes are identified, visualized and noted in the documentation of the company to which the standards and regulations relating to suppliers and customers are attached), measurement (each process is measured on the basis of basic

parameters: time, cost and quality) and control (process owners must control the flow of the process, detect depletion and elimination).

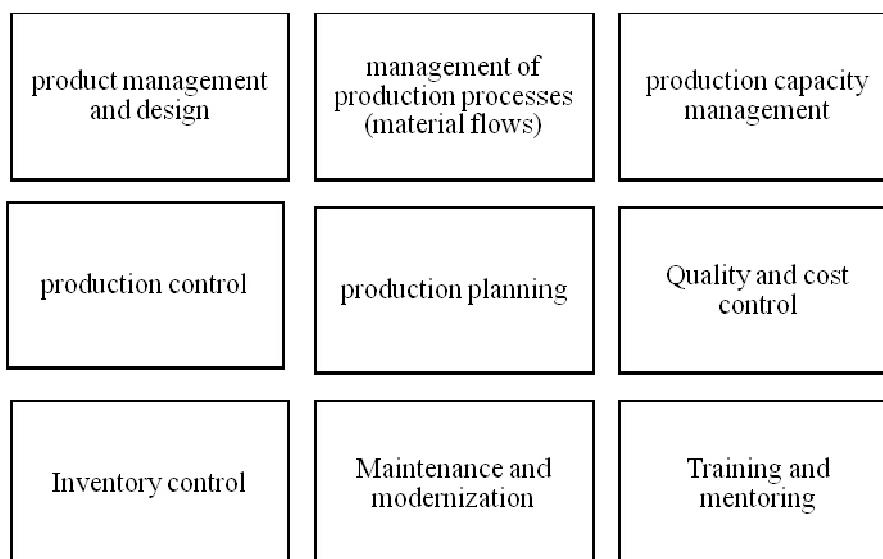
In essence, the principles of process management can be divided into three groups [10-12]: the principles attached to the work (integration and compression, delimitation, the most appropriate implementation place), process (teamwork, motivation, process-oriented, process responsibility, variant of the process of understanding, 3S: self-management, self-organization, self-management) and entrepreneurial activity (flexible autonomy) of process teams, knowledge and information without barriers).

Thus, business processes allow you to structure all types of work in the organization so that they can be evaluated and focused on business. At the level of production (operational level) business processes are aimed at solving three main tasks (fig. 8).



**Fig.8. The main tasks that are key to business processes at the production level
(compiled by the authors)**

The solution of these problems depends on the managers of the operational level, who are responsible for the management and supervision of the conversion process, play a vital role in a modern firm. They control about three-quarters of the firm's assets, including inventories, wages and benefits. They also work closely with other major divisions of the firm, such as marketing, finance, accounting and human resources. The marketing staff helps to decide what products to do or what services to offer. Accounting and human resources help them face the challenge of pooling people and resources to produce high quality goods on time and at a reasonable cost. Thus, in the production of administration involves the implementation of the following functions (Fig.9).



**Fig. 9. The main functions of the process of administration of a manufacturing enterprise
(compiled by the authors)**

This approach assumes that in accordance with the functional distribution of the management system will be allocated tasks and tasks of operational level managers. However, to ensure the efficiency of production administration, it is advisable to use a standard Business Process Modeling Notation (BPMN). This Business Process Modeling Notation (BPMN) standard was issued in May 2004 [2]. The standard business process model and notation (BPMN) will allow the company to display internal business procedures in graphical notation to simplify the process of improving them. In addition, graphical notation will facilitate understanding of collaboration between efficiency and business transactions between organizations. This will

allow businesses to understand themselves and their business participants and will allow organizations to quickly adapt to new internal and business situations.

BPMN will provide an opportunity to identify and implement strategic business goals, and then evaluate and manage the financial and operational performance of the enterprise to achieve these goals.

Business Process Modeling and Notation (BPMN) are standardized graphical notations used around the world to model business processes. It is open source, which means that the original code is available for any modification and use. The specification specifies its symbols and forms. BPMN begins and ends with a flow diagram of business processes. This is a technical flow and organization map, presented in a standardized language and available for improvement, sharing and revision (Fig. 10).

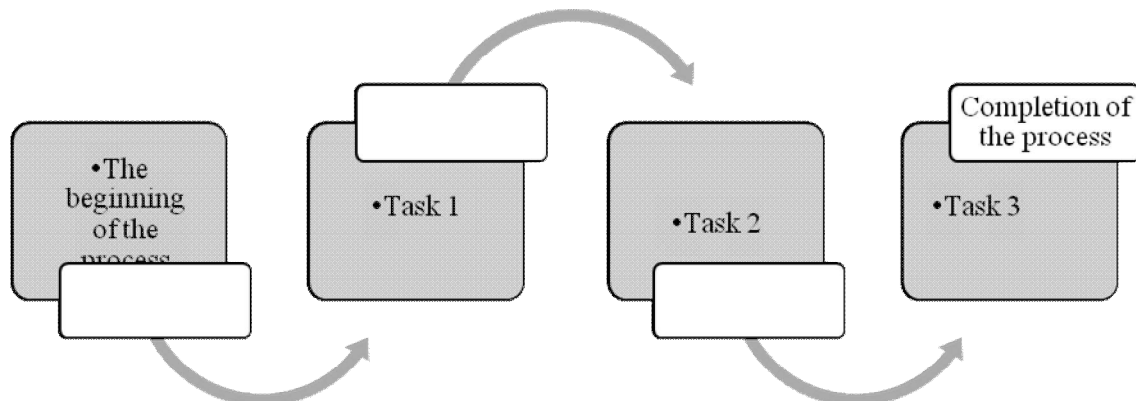


Fig. 10. Description of the business process in the proposed BPMN standard for the enterprise (compiled by the authors)

To do this, use special symbols (Table 2).

Table 2

Symbols used to display BPMN-based business processes [2]

Symbol	Essence
Loop object	
in the form of a rectangle with rounded corners	Actions – work or tasks performed by a person or system
in the form of circles	Events are what happen during the process. Divided into initial, intermediate and final
in the form of diamonds	Gateways – depict a cycle of sequences in the process. Additionally, decision points can be affected.
Data objects	
as a page with a curved corner and an arrow to the right	Input data is a dependent task. They cannot be executed until specific data has been collected.
as a page with a curved corner and an opaque right arrow	Source data – indicates the stage of the process in which data is created.
in the form of a page with a curved corner and three opaque lines at the bottom center	Data collection – refers to the collection of data required in the process (for example, during the survey).
in the form of a container	Data warehouses are used as a place to store data collected in the process.
connecting elements	
in the form of an opaque right arrow	Sequence cycles represent the order in which actions are performed.
in the form of a dotted arrow to the right with a circle to the left	Message loops represent messages and the order in which the elements of the cycle move between participants.
in the form of a dotted line	Associations associate text and artifacts with a specific event.

It should be noted that the primary goal of the BPMN standard is to develop a guide that is understandable to all business users: from analysts who create initial process projects to developers responsible for technology implementation and, finally, businessmen, managers who control business processes.

VRMN automates and streamlines business processes that are important for increasing productivity from hiring staff to processing a purchase order. VRMN facilitates the restructuring, control and management of processes involving people and systems to perform work more efficiently. The advantages that the company receives when implementing VRMN are as follows (Fig. 11).

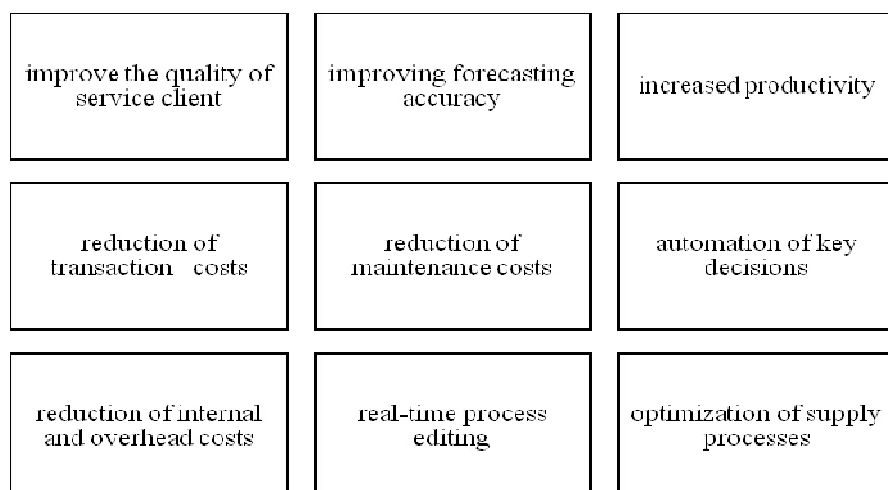


Fig. 11. Benefits of implementing VRMN business processes (compiled by the authors)

Based on Business Process Modeling Notation, visual modeling of business processes is possible. The software toolkit for this international standard is IBM WebSphere Business Modeler, which contains a simulation mechanism and allows you to simulate the created business process models. For each task in the process, execution time, cost and other characteristics are assigned, which can be variables. The essence of simulation is that the input of the created business process model receives a given number of requests in a certain time interval. The number of requests corresponds to the number of times that the process must be completed. Accordingly, when processing the next request, statistics on the execution of various stages of the business process are accumulated. The collected statistics allow to analyze the compliance of satisfaction with the requirements. In IBM WebSphere Business Modeler, analysis can be performed for the entire process, resources, tasks, and queues before and after modeling. IBM WebSphere Business Modeler provides the ability to visualize, analyze, and document business processes. In order to continuously improve, you can model business processes, and then implement and monitor them, taking certain measures based on key performance indicators (Key Performance Indicators, KPI).

Conclusions. Thus, business processes will be closely linked to strategic goals and will need to be adjusted as required, which is very convenient in the face of rapid changes in the business environment. This will increase the efficiency of business processes of the manufacturing enterprise and facilitate the adaptation of the operating system to market requirements.

REFERENCES:

1. Voronkova V.H. (2010) Operational management [Text]: [textbook. manual]. Lviv: Magnolia-2006. [in Ukrainian].
2. Business Process Modeling Notation URL : <http://www.bpmn.org/>
3. Grigorov O.S.(2002) Management of business potential of production systems: Textbook. Benefit Under total. ed. Doctor of Technical Sciences, prof. V.V. Gerasimov. Novosibirsk: NGASU. [in Russian].
4. Halushchak M.P.(2010) Organization of production [Text]: in examples and problems: textbook. K.: Kondor. [in Ukrainian].
5. Davenport T. H. (1993) Process innovation: reengineering work through information technology. Boston, Mass.: Harvard Business School Press. [in English]
6. Polonsky S.Yu. (2005) Theory and methodology of organization of client-oriented business structures: monograph. St.P.: Info-D. [in Russian].

7. Cotter J.P., Cohen D.S.(2004) The essence of change. Non-fictional stories about how people change their organizations (The Heart of Change: Real-Life Stories of How People Change Their Organizations). М.: "Olymp-Business".[in English]
8. Kozachenko A.V. Practical approaches to improving business processes.. URL: <http://easycode.com.ua/2010/11/praktichni-pidxodi-do-polipshennya-biznes-procesiv/> [in Ukrainian].
9. Morshchenok T.S. Theoretical aspects of business process management in the context of implementation of the enterprise development strategy // Business-Inform. 2014. №11. P. 295–302. [in Ukrainian].
10. Parasii-Verhunenko I.M. Operational analysis of the efficiency of using the resource potential of the enterprise: a comprehensive approach // Scientific notes of the National University "Ostroh Academy". Series "Economics": scientific journal. Ostroh: OU Publishing House, March 2017. № 4 (32). Pp. 207–212. [in Ukrainian].
11. Popov V.M. Business planning: [textbook] / [ed. V.M. Popov; S.I. Lyapunov.] М.: Finance and statistics, 2000. [in Russian].
12. Olshanskyi O.V. Development of structure and classification of business processes of trade enterprises // Economy and Society. 2018. № 19. [in Ukrainian].
13. Singh, P.K., 2012. Management of Business Processes Can Help an Organization Achieve Competitive Advantage. International Management Review, 8(2), 19-26. [in English]

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JEL E3, M1

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Адміністрування бізнес-процесів виробничого підприємства. Досліджено бізнес-процеси на виробничих підприємствах. Визначено й схарактеризовано основні бізнес-процеси виробничого підприємства. Сформовано основні завдання, які є ключовими для бізнес-процесів на виробничому рівні. Установлено основні функції адміністративного процесу на виробничому підприємстві. Запропоновано використовувати стандарт Business Process Modeling Notation (BPMN), котрий дозволить підприємствам зрозуміти себе та учасників свого бізнесу й дозволить організаціям швидко адаптуватися до нових внутрішніх і ситуацій бізнесу. В умовах конкуренції зростають вимоги не тільки до персоналу, а й до системи управління, яка трансформується в професійний менеджмент (що передбачає не тільки виконання завдань, а й досягнення цілей і раціональне використання всіх ресурсів). Однак останнім часом зростають вимоги до якості функціональних завдань і необхідність їхньої оптимізації в усіх підрозділах, які є структурними підрозділами підприємства. Отже, управління виробничим підприємством передбачає оптимізацію всіх матеріальних та інформаційних потоків на підприємстві з метою отримання прибутку і створення умов для сталого розвитку. Управління бізнес-процесами на підприємстві це підхід до управління, котрий фокусується на оптимізації впровадження бізнес-процесів в організаціях. На основі Business Process Modeling Notation можливе візуальне моделювання бізнес-процесів. Програмним інструментарієм для цього міжнародного стандарту є IBM Web Sphere Business Modeler, який містить механізм моделювання й дозволяє моделювати створені моделі бізнес-процесів. Для кожного завдання в процесі призначається час виконання, вартість та інші характеристики, котрі можуть бути змінними. Суть моделювання полягає в тому, що на вхід створеної моделі бізнес-процесу надходить задана кількість запитів у певному часовому інтервалі. Кількість запитів відповідає тому, скільки разів процес має бути завершений. Відповідно при обробці чергового запиту накопичується статистика виконання різних етапів бізнес-процесу. Зібрана статистика дозволяє аналізувати відповідність задоволеності вимогам. В IBM Web Sphere Business Modeler аналіз може виконуватися для всього процесу, ресурсів, завдань і черг до й після моделювання. IBM Web Sphere Business Modeler надає можливість візуалізувати, аналізувати і документувати бізнес-процеси. Щоб постійно вдосконалюватися, ви можете моделювати бізнес-процеси, а потім упроваджувати й відстежувати їх, уживаючи певних заходів на основі ключових показників ефективності. Таким чином, бізнес-процеси будуть тісно пов'язані зі стратегічними цілями і повинні будуть коригуватися в міру необхідності, що дуже зручно в умовах швидких змін бізнес-середовища. Це підвищить ефективність бізнес-процесів виробничого підприємства та полегшить адаптацію операційної системи до вимог ринку.

Ключові слова: бізнес-процес, основний бізнес-процес, допоміжний бізнес-процес, виробниче підприємство, адміністрування.

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Hliebova Alla, PhD (Economics), Associate Professor. **Pyvovar Vadym**, Master student. National University «Yuri Kondratyuk Poltava Polytechnic». **Administration of Business Processes of a Manufacturing Enterprise.** In the article the authors explore business processes in manufacturing enterprises. The main business processes of the production enterprise are defined and characterized. The main tasks that are key-note for business processes at the production level are formed. The authors establish the main functions of the administration process at the manufacturing enterprise. It is proposed to use the Business Process Modeling Notation (BPMN) standard, which will allow businesses to understand themselves and their business participants and allow organizations to quickly adapt to new internal and business situations of business. In conditions of competition, the requirements increase not only for staff but also for the management system, which is transformed into professional management (involving not only the implementation of tasks, but also the achievement of goals and the rational use of all resources). However, in recent years, increasing requirements for the quality of functional tasks and the need for their optimization in all departments, are structural units of the enterprise. Therefore, the administration of a manufacturing enterprise involves streamlining all material and information flows in the enterprise in order to make a profit and create the conditions for sustainable development. The business process management in the enterprise is an approach to management, which focuses on optimizing the implementation of business processes in organizations. Based on Business Process Modeling Notation, visual modeling of business processes is possible. The software toolkit for this international standard is IBM WebSphere Business Modeler, which contains a simulation mechanism and allows you to simulate the created business process models. For each task in the process, execution time, cost and other characteristics are assigned, which can be variables. The essence of simulation is that the input of the created business process model receives a given number of requests in a certain time interval. The number of requests corresponds to the number of times that the process must be completed. Accordingly, when processing the next request, statistics on the execution of various stages of the business process are accumulated. The collected statistics allow to analyze the compliance of satisfaction with the requirements. In IBM WebSphere Business Modeler, analysis can be performed for the entire process, resources, tasks, and queues before and after modeling. IBM WebSphere Business Modeler provides the ability to visualize, analyze, and document business processes. In order to continuously improve, you can model business processes, and then implement and monitor them, taking certain measures based on key performance indicators (Key Performance Indicators, KPI). Thus, business processes will be closely linked to strategic goals and will need to be adjusted as needed, which is very convenient in the face of rapid changes in the business environment. This will increase the efficiency of business processes of the manufacturing enterprise and facilitate the adaptation of the operating system to market requirements.

Keywords: business process, main business process, auxiliary business process, production enterprise, administration.