The concept of increasing the efficiency of the enterprise in modern conditions

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Abstract. In today's highly competitive business environment, improving the efficiency of enterprise activities is a crucial task for successful functioning and development. To achieve efficiency, it is necessary not only to analyze the current situation but also to plan, make decisions, and control the implementation of the strategy. This article focuses on the methods of improving the efficiency of enterprise activities in a rapidly changing economic situation. The authors present the concept and mathematical model of effective enterprise development, describing the key parameters and principles. The study explores the main methods of business optimization and management tools that can help enterprises become more competitive and successful in the market. In addition, the article discusses the importance of investing in innovation and balancing financial capabilities with development prospects to increase the efficiency of enterprise activities. The limitations of the presented mathematical model and possible directions for further research are also considered, along with other factors that may be incorporated into the model but were not discussed in the article. The findings of this study could be of great value to managers, decision-makers, and researchers working in the field of business management and optimization.

1 Introduction

The relevance of improving the efficiency of enterprise activities in modern conditions lies in the fact that modern businesses have become highly competitive, and only efficient enterprises can survive in such an environment. In addition, modern conditions are characterized by rapid dynamics of changes, digital technologies, globalization, and uncertainty, which require enterprises to quickly adapt and make decisions.

Improving the efficiency of enterprise activities in modern conditions also has important social significance. More efficient enterprise activities can lead to the creation of new jobs, improvement of the quality of products and services, increase in economic growth, and improvement of the standard of living of the population.

Moreover, improving the efficiency of enterprise activities can also have a positive environmental effect. More efficient production processes and the use of new technologies can reduce the negative impact of enterprises on the environment.

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Digitization has become one of the main factors affecting the efficiency of enterprise operations in modern conditions. One study conducted in this area was "Digital transformation and innovativeness: benefits and limitations in improving business efficiency" [1]. In this study, the authors argue that digital transformation can improve enterprise efficiency, but only if it is used in accordance with the organization's characteristics and business model.

Globalization also has a significant impact on the efficiency of enterprise operations. One study in this area is "Globalization and competitiveness of small and medium-sized enterprises" [2]. In this study, the authors argue that globalization provides new opportunities for small and medium-sized enterprises, but only if they are able to adapt to new conditions and change their business models.

The geopolitical situation also affects the efficiency of enterprise operations. One study in this area is "Geopolitical risks and management decisions to improve business efficiency" [3]. In this study, the authors argue that geopolitical risks can reduce the efficiency of enterprise operations, but only if management is unable to adapt to changing conditions and make appropriate decisions.

Innovations are also an important factor in improving the efficiency of enterprise activities. One of the studies conducted in this area is "Innovations and improvement of enterprise efficiency under uncertainty"[4]. In this study, the authors claim that innovations can help enterprises overcome uncertainty and improve their efficiency. However, they note that innovations must be organized and used rationally in accordance with the business model of the enterprise.

Personnel management also influences the efficiency of enterprise activities. One of the studies conducted in this area is "Personnel management and improvement of enterprise efficiency" [5]. In this study, the authors claim that effective personnel management can increase enterprise productivity and improve the quality of products and services.

Research shows that digitization, globalization, geopolitical situation, and innovations all play an important role in improving the efficiency of enterprise activities in modern conditions. Personnel management also has a significant impact on enterprise efficiency. However, all of these factors require rational organization and use in accordance with the enterprise's business model.

2 Materials and Methods

Literature review: A comprehensive review of existing research on the topic of enterprise efficiency was conducted to identify the key parameters and principles of effective enterprise development. Various sources, including academic journals, books, and reports, were examined to gain a broad understanding of the topic and identify potential research gaps.

Mathematical modeling: A mathematical model of effective enterprise development was developed based on the findings of the literature review, case study analysis, and expert surveys. The model incorporates key parameters such as revenue, costs, investment, and innovation, and uses mathematical equations to describe the relationships between these parameters.

Overall, the materials and methods used in this study were aimed at providing a comprehensive understanding of the factors that contribute to enterprise efficiency in modern conditions, and developing a mathematical model that can help companies optimize their operations and achieve success in the market.
3 Results

There are various methods and tools that can help improve the efficiency of a business. Let's consider some of them:

Process approach to management. This approach allows optimizing processes within the enterprise and increasing its efficiency. Within the process approach, process analysis can be conducted, bottlenecks identified, and opportunities for optimization determined [6].

Use of modern information technologies. Modern IT solutions allow automating processes within the enterprise, speeding up work with data, and improving the accuracy and timeliness of decision-making.

Cost management. Cost management is the process of optimizing costs within the enterprise. It includes cost analysis, identification of inefficient costs, and the development of measures to reduce them [7; 8].

Investing in innovation. Investing in innovation is a key factor that contributes to the long-term efficiency of the enterprise. However, it is necessary to maintain a balance between the company's financial capabilities and its development prospects.

Employee development. Employee development is the process of training and developing enterprise employees. Qualified and motivated personnel contribute to increasing the efficiency of the enterprise's work.

It is important to note that each enterprise is unique, and methods for improving efficiency should be chosen based on its specificity and needs.

The concept of effective enterprise development is an approach to business management based on strategic planning and implementation of measures aimed at improving the productivity and sustainability of the enterprise in the long term. This approach involves the use of tools and methodologies that help to identify goals and ways to achieve them, assess risks and benefits, and develop and implement plans and projects that improve the efficiency of the enterprise.

The key principles of the concept of effective enterprise development include:

- Strategic planning: defining the goals, tasks and development strategies of the enterprise in the long term, as well as developing action plans to achieve them [9];
- Risk management: assessment and management of risks associated with business processes and projects, as well as developing plans to reduce risks and increase the sustainability of the enterprise;
- Organizational management: creating an effective organizational structure and managing business processes, including identifying and reducing costs;
- Project management: developing and managing projects aimed at improving the productivity, quality and efficiency of business processes;
- Staff development: creating a system of training and development for employees, increasing their qualifications and motivation;
- Use of modern technologies: applying innovative technologies and methodologies to improve the efficiency of business processes and enhance the competitiveness of the enterprise [10];
- Stakeholder interests: taking into account the interests of various stakeholder groups, including customers, partners, investors and employees, when formulating the goals and strategies of the enterprise.

In general, the concept of effective enterprise development is based on a comprehensive approach that includes analyzing internal and external factors, analyzing the competitive environment, defining a development strategy and implementing it, as well as evaluating results and adjusting the strategy.

One of the key elements of the concept of effective enterprise development is strategic planning. It allows defining long-term goals of the enterprise and developing action plans
necessary to achieve them. These plans include assessing risks and benefits, defining necessary resources, planning budgets and timelines, as well as mechanisms for monitoring and evaluating results.

Another important element of the concept is risk management. This includes assessing risks associated with business processes and projects, and developing plans to reduce risks and increase enterprise resilience. To do this, it is necessary to analyze the external and internal environment, assess possible risks, and develop mechanisms for managing them.

The concept of effective enterprise development also includes organizational management. This means creating an efficient organizational structure and managing business processes, including identifying and reducing costs. To achieve this, it is necessary to analyze current processes and look for ways to optimize and automate them. The concept of process-based cost management, based on modern and highly efficient methods of cost management such as ABC-costing, Lean production, etc., is presented in the work of I. Naugolnova [11].

Project management is also an important element of the concept. This includes developing and managing projects aimed at improving productivity, quality, and efficiency of business processes. To achieve this, it is necessary to define the project goals, develop an action plan, assign responsibility for implementation, and monitor results. Project management is well combined with the process approach. Their combination allows making business more adaptable to volatile external factors.

Staff development is also an important element of the concept. This means creating a system for staff training and development, improving their qualifications, and motivating them to achieve results. To achieve this, it is necessary to analyze the personnel needs, develop training and coaching programs, and evaluate their effectiveness.

The concept of effective enterprise development also includes marketing and sales. This means conducting market and competitor analysis, developing marketing strategies, managing sales and customer relationships.

Fig. 1. The concept of effective enterprise development.

The mathematical model for improving the efficiency of a company's operations can be represented in the following way:

Objective function: Profit.

Constraints:
1. Risk: a constraint on the maximum level of risk, which can be expressed as a fraction of the total production costs.
2. Quality: a constraint on the minimum level of product quality.
3. Cost: a constraint on the maximum production cost the company can afford.
4. Innovation: a constraint on the minimum level of investment in innovation.

The mathematical model for maximizing profit subject to these constraints can be represented as follows:
maximize Profit = revenue – cost

subject to:

Risk ≤ max_risk;
Quality ≥ min_quality;
Cost ≤ max_cost;
Innovation ≥ min_innovation.

Where:
revenue – the revenue generated from selling the product;
max_risk – the maximum level of risk the company can tolerate;
min_quality – the minimum level of product quality required to be competitive in the market;
max_cost – the maximum cost of production that the market will bear;
min_innovation – the minimum level of investment in innovation that is required for the company, that is required to stay competitive in the market;

This mathematical model can be augmented with additional constraints, if necessary for a specific company. For example, we can add a constraint on the maximum volume of production the company can produce, or on the minimum level of customer satisfaction with the product.

4 Discussion

The presented mathematical model for improving the efficiency of a company has several constraints that need to be considered. These include the maximum level of risk, the minimum level of product quality, the maximum cost of production, and the minimum level of innovation investment. It is important to note that the minimum acceptable product quality and the maximum possible production cost are determined by the market based on the offerings of competitors and other factors [12].

Investing in innovation is crucial for the long-term success of any business. However, it is essential to maintain a balance between a company's financial capabilities and the prospects for its development with the goal of increasing the efficiency of its activities. It is important to remember that investing in innovation is not a one-time expense, but an ongoing process that requires careful planning and management.

A company must first determine its goals for innovation and the areas in which it wants to invest. This can be achieved by analyzing the needs and demands of its target market, researching the latest industry trends, and assessing the competition. Once the goals are set, the company must create a strategy for achieving them, taking into account its available resources, such as finances, personnel, and technology.

The process of innovation must be carefully managed to ensure that the company is making progress towards its goals while maintaining its financial stability. This may involve setting up a dedicated team for innovation, establishing clear roles and responsibilities, and implementing effective communication and decision-making processes. Additionally, the company must continually monitor and evaluate its innovation efforts to identify areas for improvement and ensure that they are aligned with its overall strategy.

In conclusion, investing in innovation is essential for the long-term success of a business. However, it requires careful planning, management, and monitoring to ensure that the
company is striking the right balance between financial stability and growth. By setting clear goals, creating an effective strategy, and carefully managing the innovation process, a company can increase its efficiency and competitiveness, ensuring its continued success in the years to come.

The specific risks that should be considered in this model may depend on the industry in which the company operates and its characteristics. However, some types of risks that can be taken into account in this model include:

Market risk: changes in demand for products, emergence of new competitors, changes in market prices, etc.
Technological risk: unsuccessful innovations, production issues, etc.
Financial risk: changes in interest rates, exchange rates, investment risks, etc.
Legal risk: changes in legislation, patent issues, intellectual property rights, etc.
Supplier dependence risk: problems with material supplies, dependence on suppliers, etc.

It is important to note that the list of risks may be supplemented or modified depending on the specific company and its activities. Therefore, when building a mathematical model, it is necessary to carefully analyze all possible risks to ensure that the model is realistic and effective.

Further research can focus on refining the mathematical model to account for additional factors that were not considered in this article. For example, environmental impact and sustainability can be important factors for some industries, and should be considered in the model. Another important consideration is the social impact of the company's operations, including labor practices and community involvement. These factors can have a significant impact on a company's reputation and can ultimately affect its profitability.

In addition, it is important to consider the limitations of the mathematical model itself. While the model can provide valuable insights into how a company can optimize its operations, it is based on assumptions and simplifications that may not accurately reflect the complex realities of a company's operations. Therefore, the results of the model should be interpreted with caution and validated through real-world testing and experimentation.

Overall, the mathematical model presented in this article provides a useful framework for companies to improve their efficiency and profitability while accounting for key constraints and risks. However, it is important to continually refine and improve the model to account for additional factors and limitations.

5 Conclusion

Based on the presented research, it is evident that the efficiency of enterprise activities is of paramount importance for successful functioning and development in the highly competitive business environment of today. The authors have provided a comprehensive analysis of the methods of improving efficiency and have presented a concept and mathematical model for effective enterprise development, describing key parameters and principles. The study has explored the main methods of business optimization and management tools that can help enterprises become more competitive and successful in the market.

Moreover, the article highlights the importance of investing in innovation and balancing financial capabilities with development prospects to increase the efficiency of enterprise activities. However, the limitations of the presented mathematical model have also been discussed, and possible directions for further research have been suggested.

Overall, the findings of this study could be of great value to managers, decision-makers, and researchers working in the field of business management and optimization. The study has provided a foundation for further research and has highlighted the need for continued efforts to improve efficiency in the constantly changing economic landscape.
References


