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ANALYSIS OF IMPLEMENTATION THE ERP-SYSTEM FOR ACHIEVING SUSTAINABLE ENTERPRISE DEVELOPMENT IN THE CONTEXT OF DIGITAL TRANSFORMATION*

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Digital technologies are a key factor in economic growth, increasing the competitiveness of enterprises and sustainable development. The implementation of enterprise resource planning systems (ERP systems) is one of the tools of digital transformation that has greater potential than alternative approaches. This article is devoted to the analysis of the main advantages and capabilities of ERP systems, as well as their comparison with alternative ways of digital transformation, such as the improvement of existing systems. The study reveals the problems associated with the use of outdated production management systems and demonstrates that such systems are not able to provide the necessary coordination and interaction between different functional units of the enterprise, which leads to reduced production efficiency, increased costs and deteriorated competitiveness. Modern technologies, in particular ERP systems, allow overcoming these limitations. ERP systems are complex information systems that combine all the main business processes (BP) of an enterprise in a single information space. This allows to optimize processes, automate production, monitor activities in real time and increase adaptability to the market changes. The article defines the technical and strategic aspects of the transition to an ERP system and emphasizes that this is not only a technological step, but also a strategic decision to create a sustainable and competitive basis for the further business development. The authors propose to conduct a thorough analysis of the feasibility of implementing an ERP system, taking into account the specific needs and features of the enterprise, market changes and technological progress for optimal selection and successful implementation of such systems. This strategy allows the enterprise to choose the optimal version of the ERP system and successfully implement it.

Key words: digital transformation, ERP system, sustainable development, economic efficiency, technological progress.

JEL Classification: O10, Q01, O33

Statement of the problem. In the context of the digital transformation of enterprises, business process automation is a key factor in increasing efficiency and competitiveness. However, the existing management of the manufacturing enterprise systems (MME) do not meet modern requirements. Many industrial facilities in Ukraine have implemented MME systems that are

not capable of fully automating processes, which leads to decreased productivity, increased costs, and reduced product or service quality. The main problems of the existing system are significant costs for maintenance and update services, complexity of timely implementation of changes, insufficient functionality for automating new business processes, significant costs for the involvement

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of IT specialists for the development and implementation of changes, and insufficient functionality of MME systems in general. Considering this issue, it should be noted that the current situation complicates the implementation of innovations and the transition to new business processes. The use of outdated technologies can lead to limitations in automation capabilities and inefficiency of the enterprise's operational activities as a whole. The need for digital transformation is becoming more relevant, as modern technologies can provide more productive and efficient automation and management tools, in accordance with the needs and requirements of the modern enterprise. The use of a modern ERP system allows to reduce the costs of support and update services, as it has built-in tools for automatic updating and support and a flexible architecture that allows easily implement changes in the system. In addition, the system has built-in tools for automating business processes, which makes it possible to quickly apply them without additional involvement of IT specialists. The ERP system has a modern and understandable interface that makes it easy to train staff to use it. The availability of settings at the user level leads to a decrease in the need for IT specialists for its maintenance. Optimization of these costs and ensuring effective management of labor resources are becoming an urgent task for an enterprise that seeks to maximize the benefits of digital transformation. In the modern dynamic business environment, it has become obvious that the existing management system has certain limitations and does not meet the growing needs of the enterprise. The solution of this problem involves updating technological platforms, integrating new ERP systems, and gradually transforming of business processes. The introduction of modern technologies is a key condition for successful digital transformation and sustainable development of the enterprise.

Analysis of the recent research and publications.

Such scientists as Alves M. [1], Batiuk A. [2], Vovk I. [3], Chalyi S. [4], Yanchuk T. [5], Tomchuk V. [6], Kalachyk A. [6], Oksamitna L. [7], Pryaha R. [7], Pylypenko L. [8], Redko M. [8], Zhus O. [9], Rakytska S. [9], Tozhieva G. [9], Smolych D. [10] and others were engaged in studies of the implementation of ERP systems as a tool for the digital transformation of business, which allows enterprises to increase their efficiency, competitiveness and adaptability to changes in the market environment.

The authors [6] identified the main benefits of ERP implementation:

- availability and consistency of data – data entered once become available within the framework of a complete system, which in turn allows avoiding the stage of data reconciliation and additional confirmation;
- monitoring the work of employees – a common database excludes the possibility of abuse, since the manager can detect inconsistencies in indicators and their causes in real time;
- reducing the probability of errors related to the so-called "human factor", since all data will be transmitted automatically without distortions.

The classification of ERP systems by purpose: complex, branch, for small business, is one of the most common in the scientific literature [7]. Complex systems allow to automate a wide range of business processes in various industries. Such programs include various tools and modules aimed at supporting the efficient functioning of the enterprise, and developed mechanisms for integration with other systems and programs. Branch ERP systems are focused on companies that operate in one specific economic sector, as well as specialized enterprises. For example, on companies selling air tickets. Formally, IT systems for small businesses cannot be attributed to the ERP class due to the minimal set of functions. However, such software products fully cover the needs of companies. They are most often used to optimize the work of technical service stations (STO), consulting companies and other small enterprises. ERP systems are tools that allow enterprises to automate and integrate their business processes. They provide centralized data and process management, which increases the efficiency and competitiveness of enterprises.

According to researchers [8], the main part of ERP system customers are representatives of the industrial sector of the economy, a significant amount is also implemented in the areas of finance, distribution and information technology. The smallest share of implementations is observed in the field of telecommunications, health care and education. The scientists noted that an important condition for the implementation of the ERP system and the selection of the appropriate software product is a deep analysis of the specifics of the enterprise, its organizational structure, business processes, the corresponding information flows and the information needs and requests of the users of this system in the process of managing the enterprise's activities.

In the scientific paper [9], the efficiency of implementing an ERP system to stabilize the activities of construction enterprises is substantiated. The authors defined the enterprise resource planning system ERP as a software product designed for planning and analysis of enterprise activities, automation and optimization of production processes. The study found that the unique needs of construction companies require specialized ERP software. Such systems should include the management of general contractors, subcontractors, financial management, the level of material supply, calculation of wages, costing, construction of an optimal schedule of construction works, monitoring of project stages and service operations in a single central database. ERP systems enable seamless transfer of information between all business functions and business units, within and across geographic areas. The competitive advantages provided by ERP software became especially relevant in 2020, at the beginning of the COVID-19 pandemic and the introduction of quarantine restrictions.

The author [10] believes that in order to minimize risks and maximize the benefits of implementing an ERP system, it is necessary to carefully plan and evaluate each stage of the project. First, it is important to set business

goals, conduct a diagnosis of current business processes and IT systems, model the desired effect of the system implementation, plan the project budget and time frames for its implementation, and only as the next step to select software that will meet the functionality set by the company's goals. The researcher identifies the main stages of implementing an ERP system at an enterprise:

- organizational stage – it is necessary to form a working group of representatives of various divisions of the enterprise, which will be responsible for the implementation of the ERP system. The group develops a system implementation plan, determines funding sources and selects an integrator company;

- the stage of surveying the enterprise and designing the ERP system – studying and analyzing the main business processes of the enterprise. It is necessary in order to accurately determine the terms and cost of work on the implementation of the ERP system. Programmers identify the main requirements for the basic modules of the ERP system, the need to load initial data, as well as the configuration parameters for transferring information from the programs used by the organization;

- the stage of determining the effect of the implementation of the ERP system – the working group determines plans for achieving key indicators after the implementation of the system. The main indicator for evaluating the effect of the implementation of the ERP system is the costs incurred for implementation;

- the stage of implementation of the ERP system at the enterprise – the installation of ERP system programs on staff workplaces, setting of access rights and reports, downloading of data from previously used computer programs by the enterprise;

- the stage of putting the system into operation – user training is carried out and instructions for working in the system are developed;

- the stage of evaluating the effective implementation of the ERP system – the effect of using the software is evaluated after one year of active operation.

Based on the above, it can be determined that the successful application of the ERP system, which will contribute to the sustainable development of the enterprise, requires careful development and implementation of an implementation strategy.

Highlighting previously unresolved parts of the general problem and formulating the goals of the article.

The critical analysis of the scientific literature showed that, despite the significant number of studies devoted to the topic of ERP system implementation and their significant contribution to solving the problem, there are still some previously unresolved issues. In particular, the features of implementing ERP systems in comparison with the alternative way of digital transformation of business, the impact of implementing an ERP system on the efficiency of enterprise management, and the factors of successful implementation of ERP systems have not been sufficiently studied. The goal of this article is to identify and analyze the key relationships and features of the implementation of

the ERP system, in comparison with alternative methods of digital transformation of an enterprise. The results of the study, based on the use of various methodological approaches, have scientific and practical significance for businesses at various stages of digital transformation, as they allow to gain a deep understanding of this problem and make an effective decision on the implementation of the ERP system.

Summary of the main research material. In today's digital economy, businesses need to constantly innovate and improve their efficiency to stay ahead of the competition. ERP technologies are one of the tools of digital transformation and improving business efficiency. The ERP system is a software application that integrates all of a company's core business processes, such as manufacturing, procurement, finance, sales, and human resources [11].

Modern ERP systems offer a number of capabilities and benefits that can help businesses improve their efficiency and competitiveness [12; 13]:

- integration of processes: ERP systems integrate all aspects of production and management, from raw material accounting to the export of finished products. They integrate finance, logistics, production, warehouse management and other enterprise departments. This allows to obtain consistent information and improves decision-making;

- production planning: ERP systems help manufacturing companies optimize production planning. They take into account available resources, deadlines, and product demand, allowing businesses to maintain optimal capacity and avoid unnecessary costs;

- inventory management: ERP systems help with inventory control of raw materials and finished products. They automate the processes of ordering, receiving, and shipping goods, which reduces the risks of overstocking or stock shortages;

- improving product quality: ERP systems help establish quality standards and track production deviations from them. This contributes to the improvement of product quality and satisfaction of consumer needs;

- financial management: ERP systems allow for financial accounting, including raw material costs, labor costs, taxes, and other financial transactions. It helps businesses to carry out effective financial management;

- analytics and reporting: ERP systems provide the ability to analyze data and build reports, which contributes to a better understanding of production efficiency and the financial state of the enterprise;

- easy access to information: ERP systems provide the ability to access data and manage business processes from anywhere and at any time thanks to cloud technologies.

The use of ERP technologies as a tool of digital transformation will help the enterprise to solve problems with the existing management of the manufacturing enterprise systems. Taking into account the above, it is advisable to consider the option of transition of the enterprise to a new modern system of resource planning.

Table 1 shows a comparative analysis of software complexes of MME and modern ERP systems.

Based on the data in the table, it should be noted that the modern ERP system has advantages compared to the old MME. Considering various aspects, such as functionality, technical architecture, security, and interface, it becomes obvious that new ERP systems offer better opportunities for supporting business processes. The modern ERP system has extended functionality and an intuitive interface that makes it easier for employees at all levels. It is important to note that ERP based on a new technological platform and it allows the use of web browsers, mobile applications and cloud technologies for convenient access to data. The modular architecture of the ERP system simplifies the process of adding new functions and adapting to changes in business processes. Active developer support, regular updates and bug fixes help the system evolve and improve to meet modern requirements. The modern ERP system is distinguished by increased security due to the multi-level architecture and the use of web access. It also has

the ability to integrate with new operating systems and devices, making it versatile and compatible with various technology standards. Another important aspect is the fast execution of tasks and improved mobility through the web client and cloud technologies. This ensures efficient use of the system and the ability to access it regardless of the user's location. The conducted analysis shows that the old MME system is limited in many areas, such as functionality, technology platform, architecture, support, interface, security, compatibility, speed and mobility. In general, the transition from the old MME system to a modern ERP system is a justified and strategically important step for an enterprise that seeks to optimize its business processes and increase productivity in order to achieve the goals of sustainable development.

The SWOT matrix, developed on the basis of the received data and reflected in Table 2, is a tool for considering options and opportunities for restructuring the further business concept through digital transformation. The analysis will help to develop an implementation

Table 1 – Comparative analysis of the functions and capabilities of software complexes of MME and modern ERP systems

| Aspect | MME | Modern ERP system |
|---------------------------------------|--|---|
| Functionality | Limited capabilities, lack of modern functions related to the operation of most interface objects in web mode and thin client mode. | Advanced capabilities and modern features that allow users to work more efficiently, the ability to work all interface objects in web browser mode and thin client mode. |
| | An old technology platform that was originally developed without the use of web and cloud data access technologies. | A powerful new technology framework focused on web browser and mobile app mode. Increasing management efficiency due to the use of cloud technologies. |
| | The system architecture is not evolving. | Modularity of the system, the ability to add new sections for the emerging needs of automation of activities and new production BP. Progressive methodology and new management functions. |
| Support | Most developers announce the end of support for old software, update releases and bug fixes in the near future. | Developers of new software actively provide support, fix bugs and release updates. |
| Interface | Outdated, unintuitive. | Modern, convenient and intuitive interface, which makes it easier to work with it. |
| Security | Vulnerabilities, insufficient security, if the mode of operation is only the file base. | Improved security, updated protection measures against potential threats and cyber-attacks due to the presence of a multi-level architecture, the use of web access and modern encryption algorithms. |
| Compatibility | Does not support or has limited support for new hardware operating systems and standards. | Compatibility with the latest versions of operating systems, optimized for work on new devices and architecture. |
| Speed | Slow operation, loading. | Quick execution of tasks. |
| Mobility and accessibility | Outdated access mechanism, limited application functionality. | Availability of a web client and the possibility of using cloud technologies. |
| Cost | The cost of support and update services is several times higher due to the fact that outdated systems require more resources to support regulated changes. | The low price of the service package compared to the cost of purchasing the main program. |
| Prospects for development and scaling | Lack of prospects for the possible development of the system in the future. | Prospects and possibility of development and support of the system in the future. Ability to scale. |
| Integration with other systems | Lack of built-in integration mechanisms, the need to involve IT specialists for the development and implementation of new services. | It can easily interact with other programs and services, the presence of built-in universal data exchange mechanisms. |

Source: compiled by the authors

Table 2 – SWOT matrix as an example of substantiating the decision to purchase and implement a modern ERP system for an industrial enterprise

| Strengths | | Weaknesses | |
|---------------------------------------|---|-------------------------------|---|
| Improved automation and functionality | A modern ERP system can significantly improve the automation of business processes. | Implementation time | Maybe delays during the transition to the new system. |
| Integration | Ability to integrate all business processes into one digital platform. | Personnel training | The need for employee training. |
| Support | Excellent support is expected from the system vendor. | Cost | Implementation costs and staff training. |
| Security | Improved security, updated protection measures against potential threats and cyber attacks. | | |
| Prospects for development and scaling | Possibility of development and scaling of the system in the future. | | |
| Opportunities | | Threats | |
| Optimization of processes | Reducing time spent on tasks and increasing productivity. | Staff resistance | Employee resistance is possible when switching to a new system. |
| Expanding functionality | Ability to add new modules and functions. | Technical problems | Risk of failures or malfunctions during implementation. |
| Analytics | Access to analytical reports and data for making informed and well-considered decisions. | Changes in business processes | The need for internal changes to adapt to the new system. |

Source: compiled by the authors

strategy, identify main risk management points, and ensure the successful integration of the new system into the enterprise's operations.

The analysis of the main disadvantages and advantages allows to draw a conclusion about the expediency of making a decision to purchase and implement a modern ERP system at the enterprise as the main tool of digital transformation.

Analysis of the economic feasibility of implementing an ERP system for digital business transformation has some key elements. First of all, it is necessary to determine the total cost of implementing the ERP system, including licenses, configuration, staff training, and support. The next step is to consider the expected savings through automation of business processes, reduction of errors and optimization of staff work. An important factor is to determine the approximate implementation time of various ERP solutions, because a longer implementation period can lead to additional costs. It is necessary to evaluate the integration of the ERP system with the existing systems at the enterprise, to compare the functionality of different ERP systems and their compliance with the needs of the company. The assessment of the level of support and maintenance provided by the ERP supplier is one of the determining aspects. If possible, it is worth forecasting the expected profit gains through optimization of business processes, increased productivity and improved service quality. Implementation risks and additional effects on business processes and employees must be considered. It is necessary to compare the implementation of the ERP system with alternative ways of digital transformation,

such as improving existing systems or using individual tools. When conducting a comparative analysis, the specific needs and characteristics of the company, changes in the market situation and technological progress should be taken consider. The analysis of these aspects will help to make an informed decision regarding the choice of an ERP system for the digital business transformation. Table 3 demonstrates a comparative analysis of the implementation of an ERP system with alternative ways of digital transformation, such as improving of existing systems.

In order to analyze the structure of the decomposition of work and estimate labor costs for improving existing systems, will use the PERT (Program Evaluation and Review Technique) method, which is a project management tool and allows to estimate and control the duration of tasks in the project [14]. The PERT method uses three time estimates for each task: the best time (O – optimistic), the worst time (P – pessimistic) and the most likely time (M – most likely).

Estimates of labor costs for each task are given in three numbers (O, M, P). For example, if the task is software development, the expert can give the following estimates: A: O = 10 hours, M = 15 hours, P = 26 hours.

To calculate the estimate of labor costs (L), the formula is used: $L = (O + 4M + P) / 6$.

Will get an estimate of labor costs $L = (10 + 60 + 26) / 6 = 16$ hours.

Such calculation will allow to get a numerical value that reflects the average estimate of labor costs for each task.

Table 3 – Comparative analysis of ERP system implementation with alternative ways of digital transformation

| Modern ERP system | Improvement of existing systems |
|---|--|
| Provides integration of all functions in one system | Needs more integration and synchronization between different systems |
| It has wider functionality and capabilities | Aspects that a specific business needs |
| Support from the supplier | An internal technical support team |
| The risk of misuse of the system | The risk associated with improving existing systems |
| Amenable to rapid technological improvement | Can be more flexible in responding to changes |

Source: compiled by the authors

Consider the ERP system "Business automation software for enterprise resource planning" (BAS ERP) [15] and the labor costs for the development of the "CRM and marketing" subsystem, which consists of a set of metadata:

- general modules: client-server assortment, server assortment, formula management, client-server formula management pricing, client pricing, client-server pricing;
- reference data: loyalty programs, types of loyalty cards, types of gift certificates, types of customer agreements, types of prices, payment schedules, product collections, marketing activities, brands, partners, rules for accruing and redeeming loyalty points, customer complaints, causes of demand complaints, causes of lost deals, projects, sales ratings for products, roles of contact persons in deals and projects, roles of partners in deals and projects, customer agreements, product segments, partner segments, discounts on prices, warehouses, deals with customers, process statuses, product categories, terms for granting price discounts, store formats;
- documents: questionnaire, assortment change, survey assignment, accrual and redemption of loyalty points, customer mailing, registration of supplier product prices, assortment quota setting, product price setting;
- reports: ABC-XYZ analysis of assortment, ABC-XYZ distribution of customers, ABC analysis of customer dependence, assortment performance analysis, BCG customer base analysis, XYZ customer loyalty analysis, survey analysis, primary interest analysis, primary demand analysis, loss reason analysis, analytical score report, probabilistic forecast, sales breakout, assortment price change dynamics, partner property filling, change in customer distribution, contact information, assortment segment intersection, partner segment intersection, price list, applied discounts in the document, assortment price agreement results, segment composition, assortment status, partner segment comparison, comparative analysis of assortment and sales dynamics, current assortment fill, current assortment quotas.

The analysis of the work decomposition structure for the development of the general modules of the BAS ERP "CRM and Marketing" subsystem is given in Table 4.

The cost of the ERP system BAS ERP is currently 216 000 UAH and has typical functionality that does not depend on the volume of operations at the enterprise. Separately, there are industry solutions on sale, for example BAS AGRO ERP, which has a slightly higher cost of 259 200 UAH, but is supplemented with the typical functionality for accounting of agricultural enterprises.

For large holdings, there is a BAS Holding Management solution, which, in addition to the basic configuration cost of 720 000 UAH, includes separate licenses for subsidiaries and branches worth 120,000 UAH each [16]. Based on the obtained results, conclude that the cost of developing only the general modules of the "CRM and Marketing" subsystem, based on the estimation of labor costs using the PERT method and the condition of the average hourly cost of an IT specialist's work of 1 000 UAH, is: $203 * 1000 = 203\ 000$ UAH. That is almost 94 percent of the full cost of the BAS ERP system, which includes new important automation subsystems for the development of the enterprise. The conducted analysis confirms the economic feasibility of choosing an ERP system on the path of digital transformation and sustainable development of the enterprise. The proposed approach and the evaluation confirm that the company will be able to obtain an economic effect from the use of new software in a short period of time from the moment of implementation of BAS ERP.

Conclusions. The research yielded the following findings and conclusions.

Digital transformation is strategically importance for effective enterprise management and achieving competitive advantage. It is a practical step towards improving operational efficiency, increasing productivity and improving the company's ability to adapt to changes in the market. The implementation of the ERP system is one of the most important elements of the digital transformation of the enterprise. It allows to automate and integrate the main business processes of the enterprise, identify optimization opportunities and ensure the uniform flow of information between all structural units.

Thanks to digital transformation through the implementation of a modern ERP system, the company gets the opportunity to monitor and control various aspects of its activities in real time, from financial reporting to the supply chain. Automation of business processes simplifies the work of personnel, reduces the probability of errors and facilitates prompt management decisions. The implementation of ERP systems has a positive impact on such indicators of enterprise activity as management efficiency, productivity, customer service quality, opportunities for business development. The transition of an enterprise to the use of a modern ERP system becomes not only a technical step, but also a strategic decision aimed at forming a stable and competitive basis for further sustainable development.

Table 4 – The analysis of the work decomposition structure for the development of the general modules of the BAS ERP "CRM and Marketing" subsystem

| The type and object of metadata | Key procedures and functions | The number of lines of code | Estimation of labor costs according to the PERT method (hours) |
|--|---|-----------------------------|--|
| 1 | 2 | 3 | 4 |
| General module «Client-server assortment» | <ul style="list-style-type: none"> – assortment checking parameters. | 21 | 1 |
| General module «Server assortment» | <ul style="list-style-type: none"> – types of prices changes in assortment meet the rules; – types of prices by assortment; – enable selection by assortment; – control assortment; – get planning object; – display movements; – get parameters for document approval; – get price by assortment; – check assortment of table of selected goods, check necessity on the basis; – result of package types of prices and goods for setting by assortment; – structure of quota by category, structure of assortment status of goods in format. | 665 | 16 |
| General module «Working with formulas» | <ul style="list-style-type: none"> – add a group of logical operators; – add a group of operators; – add a group of standard operators; – add a group of functions; – add an operand; – add an operator; – get an empty tree of operands; – get an empty tree of operators; – get a standard tree of operators; – build a tree of operators; – check a formula. | 359 | 6 |
| General module «Client-server formula working» | <ul style="list-style-type: none"> – array of operands for the tree; – operands of a text formula; – get the text of an operand for insertion. | 244 | 8 |
| General module «Pricing» | <ul style="list-style-type: none"> – price type price list, display movements; – parameters for document approval; – convert amounts to currency of goods; – convert amounts in a row; – convert amounts in a row by the amount with VAT; – convert amounts in a table part to currency; – get required fields of data composition scheme; – check the correctness of filling in the document of setting the prices of nomenclature; – check the correctness of filling in the document of setting the prices of nomenclature of the supplier; – check the field of the data set; – check the data composition scheme; – check the data composition scheme for required fields; – distribute the amount by stages of payment; – calculate the amounts of mutual settlements in the table part, notify about errors in the correctness of filling in the nomenclature of the supplier; – notify about registration of prices; – notify about errors in the correctness of goods for registration of prices of the supplier; – notify about errors in the presence of duplicates of goods for registration of prices; – notify about errors in the presence of established prices for registration of prices; | 1472 | 160 |

| 1 | 2 | 3 | 4 |
|--|---|-----|-----|
| | <ul style="list-style-type: none"> – notify the user about an error in the registration of supplier prices; – form a query temporary price table without duplicates for price registration; – form a query temporary price table for price registration; – form a query temporary price table for price registration of the supplier; – form a query correctness of filling in the nomenclature of the supplier; – form a query correctness of goods for price registration; – form a query correctness of goods for price registration of the supplier; – form a query availability of duplicates for price registration; – form a query availability of established prices for price registration; – set conditional formatting of types of prices; – set conditional formatting price includes VAT; – prices of the supplier's nomenclature. | | |
| General module «Customer pricing» | <ul style="list-style-type: none"> – ask a question about the price recalculation when the date changes; – recalculation in currency is required; – recalculation of the amount of mutual settlements is required; – notify about the completion of the recalculation of amounts in currency. | 119 | 4 |
| General module «Client-server pricing» | <ul style="list-style-type: none"> – round the price; – parameters for obtaining the prices of the supplier's nomenclature; – get the VAT rate with a number; – get the amount of the document; – apply psychological rounding; – calculate the amount of VAT. | 157 | 8 |
| | Total | | 203 |

Source: compiled by the authors

Analyzing the SWOT matrix for the purpose of acquiring and implementing an ERP system for an industrial enterprise, the following strengths can be identified: improved automation and functionality, modern integration and support, security issues, and prospects for development and scaling. Weaknesses should also be addressed: issues of implementation time, staff training and its cost. Opportunities that can be obtained as a result of the implementation of the ERP system: process optimization, expansion of functionality and analytics. Threats to consider: staff resistance, technical problems and changes in business processes.

The use of the PERT method in project management allows to obtain more accurate and substantiated forecasts of the duration of tasks, which is the key to successful

project planning and execution. The duration of tasks can vary from an optimistic to a pessimistic scenario. Therefore, the analysis of the work breakdown structure and the assessment of labor costs for improving existing systems makes it possible to compare the effectiveness of implementing a new ERP system with the continuous improvement of the existing system.

The study does not consider which specific functions are planned to be implemented in the new ERP system. In further research it is important to focus on a thorough analysis of the company's needs, in order to develop practical recommendations for creating a detailed plan for the implementation of ERP systems and providing practical recommendations for staff training.

REFERENCES:

1. Alves, M. C. & Matos, S. I. A. (2012). ERP adoption by public and private organizations – a comparative analysis of successful implementations. *Journal of business economics and management*, vol. 14(3). DOI: <https://doi.org/10.3846/16111699.2011.652979> (accessed on: 10.12.2023)
2. Batiuk, A. E. (2004). *Information systems in management*: Lviv: Intellect-Zahid.
3. Vovk, I. (2011). Problems of automating enterprise resource management by means of ERP systems. *Socio-economic problems and the state*, vol. 2(5). Available at: <http://sepd.tntu.edu.ua/images/stories/pdf/2011/11vipres.pdf> (accessed on: 10.12.2023)
4. Chalyi, S. F. (2007). Automated management of business processes (models, methods and technologies): dissertation. Dr. Tech. Sciences: specialist 05.13.06. Kharkiv National University of Radio Electronics.

5. Yanchuk, T. F. (2016). The importance of the mechanism of information technology implementation in the economic activity of the enterprise. *Economics and management organization*, vol. 4(24). Available at: <https://jeou.donnu.edu.ua/issue/view/74> (accessed on: 10.12.2023)
6. Tomchuk, V. V. & Kalachyk, A. V. (2019). ERP systems and their places in management accounting. *Finance accounting banks*, vol. 1 (24). Available at: <https://r.donnu.edu.ua/xmlui/handle/123456789/762?show=full> (accessed on: 10.12.2023)
7. Oksamitna, L. P. & Pryaha, R. I. (2022). Features of modern ERP systems for managing enterprise business processes. *Management of development of complex systems*, vol. 51. DOI: <https://doi.org/10.32347/2412-9933.2022.51.31-40> (accessed on: 10.12.2023)
8. Pylypenko, L. M. & Redko, M. O. (2019). Analysis of the advantages and disadvantages of implementing the ERP system at enterprises. *Pryazovsky economic gazette*, vol. 6(17). Available at: https://www.pev.kpu.zp.ua/journals/2019/6_17_ukr/6_17_2019.pdf#page=172 (accessed on: 10.12.2023)
9. Zhus, O. M., Rakytska, S. O. & Tozhieva, H. M. (2023). Stabilization of construction industry enterprises through the implementation of the ERP system. *Digital economy and economic security*, vol. 4(04). Available at: <http://dees.iei.od.ua/index.php/journal/article/view/122> (accessed on: 10.12.2023)
10. Smolych, D. V. (2021). Optimizing enterprise resource management by implementing an ERP system. *Economic space*, vol. 166. Available at: <http://srd.pgasa.dp.ua:8080/bitstream/123456789/6406/1/Smolych%20.pdf> (accessed on: 10.12.2023)
11. What is an ERP system and what are its benefits. Available at: <https://kpmg.com/ua/uk/blogs/home/posts/2022/10/shcho-take-erp-systema-ta-v-chomu-yiyi-koryst.html> (accessed on: 10.12.2023)
12. Features of modern erp systems for managing business processes of an enterprise. Available at: https://urss.knuba.edu.ua/files/zbirnyk-51/31-40_0.pdf (accessed on: 10.12.2023)
13. What is an ERP enterprise management system and where is it better to place it? Available at: <https://www.sim-networks.com/ukr/blog/enterprise-resource-planning-systems-and-cloud-infrastructure> (accessed on: 10.12.2023)
14. What is PERT? Available at: <https://experience.dropbox.com/uk-ua/resources/pert> (accessed on: 10.12.2023)
15. BAS ERP. Available at: <https://www.bas-soft.eu/soft/bas-corp/bas-erp/> (accessed on: 10.12.2023)
16. BAS products and prices. Available at: <https://conto.com.ua/ua/prices> (accessed on: 10.12.2023)

АНАЛІЗ ВПРОВАДЖЕННЯ ERP-СИСТЕМИ ДЛЯ ДОСЯГНЕННЯ СТАЛОГО РОЗВИТКУ ПІДПРИЄМСТВА В КОНТЕКСТІ ЦИФРОВОЇ ТРАНСФОРМАЦІЇ

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Цифрові технології є ключовим фактором економічного зростання, підвищення конкурентоспроможності підприємств та сталого розвитку. Впровадження систем планування ресурсів підприємства (ERP-систем) є одним із інструментів цифрової трансформації, який має більший потенціал, ніж альтернативні підходи. Ця стаття присвячена аналізу основних переваг та можливостей ERP-систем, а також їх порівнянню з альтернативними шляхами цифрової трансформації, такими як вдосконалення існуючих систем. Дослідження розкриває проблематику, пов'язану з застосуванням застарілих систем управління виробничими підприємствами, та демонструє, що такі системи не здатні забезпечити необхідну координацію та взаємодію між різними функціональними підрозділами підприємства, що призводить до зниження ефективності виробництва, збільшення витрат та погіршення конкурентоспроможності. Сучасні технології, зокрема ERP-системи, дозволяють подолати ці обмеження. ERP-системи є комплексними інформаційними системами, які об'єднують у єдиному інформаційному просторі всі основні бізнес-процеси (БП) підприємства. Це дозволяє оптимізувати процеси, автоматизувати виробництво, моніторити діяльність в реальному часі та підвищувати адаптивність до змін на ринку. Стаття визначає технічні та стратегічні аспекти переходу до ERP-системи та підкреслює, що це не лише технологічний крок, а й стратегічне рішення для створення стійкої та конкурентоспроможної бази для подальшого розвитку бізнесу. Автори пропонують проводити ретельний аналіз доцільності впровадження ERP-системи, враховуючи конкретні потреби та особливості підприємства, зміни на ринку та технологічний прогрес для оптимального вибору та успішної імплементації таких систем. Запропонована стратегія дозволить підприємствам вибрати оптимальний варіант ERP-системи та успішно реалізувати її впровадження.

Ключові слова: цифрова трансформація, ERP-системи, сталий розвиток, економічна ефективність, технологічний прогрес.

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