

MODEL OF DIGITIZATION OF INTERNAL BUSINESS COMMUNICATIONS OF AN ENTERPRISE BASED ON AUTOMATION OF BUDGETING

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Modern enterprises operate in an environment of constant dynamic changes and high uncertainty, which requires management to have prompt access to relevant financial data, transparency of information flows, and automation of management decision-making procedures. In this study, the ERP system is considered as an integrated digital platform that ensures the formalization of internal communications and supports comprehensive financial resource planning. The aim of the article is the theoretical substantiation and practical analysis of budgeting automation as a tool for digitalizing the internal business links of an organization, as well as determining the organizational and management effects of its implementation. It is proven that transitioning internal communications to a digital format based on budgeting modules allows for transforming traditional non-formalized flows into a structured system of verified data exchange, minimizing the influence of the human factor. It is substantiated that the deep integration of budgeting functions with ERP accounting and analytical subsystems ensures the automatic reflection of actual indicators in real-time, supports multi-variant scenario modeling, and significantly reduces the time spent on approving management documentation. The scientific novelty of the research lies in the development and substantiation of an original three-stage model for digitalizing internal business communications based on the implementation of ERP solutions. Unlike existing approaches, the proposed model contains a specific iterative «refinement» stage, which ensures a two-level alignment of the enterprise's strategic goals with the technical parameters of the information system. This includes the unification of directories, the normalization of large data sets, and the automation of irregular cost item exchange. This approach increases information relevance and allows for the integration of budget models with management reporting systems. The practical significance of the results obtained lies in the formation of a universal, scalable approach to modernizing management processes. The implementation of the proposed model contributes to the creation of a «single source of truth» information space, the minimization of manual data processing, and the optimization of cross-functional interaction between structural units of the organization, which collectively increases its strategic flexibility and competitiveness.

Keywords: ERP systems, budgeting automation, digitalization of internal communications, management decisions, digital transformation of business processes.

JEL Classification: M15

Formulation of the problem. The current stage of the world economy is characterized by the active spread of digital technologies and the transformation of enterprise management processes. In these conditions, the effectiveness of organizations increasingly depends on the ability to integrate information flows, ensure operational data exchange between departments and use digital tools

to support management decisions. One of the key areas of such transformation is the digitalization of internal business communications, which allows formalizing the processes of interaction between structural units and increasing the transparency of management.

Despite the active implementation of enterprise resource management information systems, in the

practice of many enterprises, the problem of fragmented information flows and excessive dependence on manual data processing, in particular in the processes of financial planning and budgeting, persists. The use of spreadsheets or isolated software solutions leads to an increased risk of errors, an increase in the time for approval of management documents and a decrease in the efficiency of internal communications.

According to researchers, the digitalization of the economy ensures the integration of production and management processes into a single information space, and the potential economic effect of the use of digital technologies can be from 4.5 to 15.5% of the world's gross domestic product [1]. In this context, the use of ERP systems, which allow integrating financial, accounting and management processes of the enterprise, is of particular importance. As Porter M. and Millar V. point out, information technologies create new opportunities for gaining competitive advantages, as they provide systematic data processing and integration of information flows within the organization [2].

At the same time, the scientific literature has not sufficiently explored the issue of transforming internal business communications of enterprises as a result of the implementation of complex ERP solutions, in particular through budgeting automation mechanisms. This necessitates in-depth research into the role of budget systems as a tool for digitalizing communication processes and increasing the efficiency of enterprise management.

Analysis of the recent research and publications. Much academic attention is paid to the study of business processes of enterprises and the problems of increasing the efficiency of their functioning. Chornobay L. and Duma O. [3] analyzed the economic essence of business processes of an enterprise and determined their role in the formation of the organizational structure of management. The methodological principles of business process management and their systematization are considered in the work of Netepchuk V. [4]. In turn, a group of scientists led by Prokopenko O. [1] studied the efficiency of business processes in the digital economy and emphasized the importance of integrating digital technologies into the enterprise management system. A separate area of scientific research is devoted to the issues of modeling and automation of business processes. Kopyyka O. [5] studied the features of modeling and automation of processes in the telecommunications industry, while Korzachenko O. [6] focused on the problems of optimizing business processes of Ukrainian enterprises and identified the main barriers to their effective transformation.

A significant contribution to the study of business communications of enterprises has been made by researchers who analyze the features of information interaction between economic entities and the use of modern communication tools. Thus, the impact of globalization processes on the communication activities of business entities was studied by Bozhkova V., Shypulina Yu. and Bozhkov. D [7]. At the same time, recent studies emphasize that the development

of digital information systems significantly transforms organizational communication processes and facilitates more efficient data exchange within enterprises [8]. A typology of business communications of innovatively active enterprises was developed by Kyryev O. [9]. Certain aspects of internal communications, particularly marketing, were considered in the studies of Bashynskaya I. and Filippova S. [10], while the assessment of communications quality in industrial enterprises was analyzed by Teletov O. and Ivashova N. [11].

In modern research, there is also increasing attention to the use of digital technologies to automate management processes. Bhardwaj, V. [12] summarized modern approaches to the use of robotic process automation in a business environment and demonstrated its potential in reducing administrative burden and increasing the efficiency of enterprises' operational activities.

Highlighting previously unresolved parts of the general problem and formulating the goals of the article. Despite the significant number of scientific works devoted to the study of business processes, business communications and digitalization of management systems, the scientific literature does not sufficiently cover the issue of transformation of internal business communications of enterprises as a result of the comprehensive implementation of ERP systems. Special attention needs to be paid to the study of the role of budgeting automation as a tool for digitalization of enterprise communication processes. The use of such systems creates the prerequisites for the integration of information flows between structural units, reducing the time for approval of management documents, reducing the number of errors associated with manual data processing, as well as increasing the transparency of financial planning and the effectiveness of management decisions.

The aim of the study is to theoretically substantiate and analyze the role of budgeting automation as a tool for digitizing internal business communications of enterprises, as well as to determine the organizational and managerial effects of its implementation. To achieve the goal, the following main tasks were identified in the study: to investigate the advantages and prospects of implementing ERP systems in the activities of enterprises; to formalize the process of digitizing business communications of an enterprise based on a case study of budgeting automation; to develop a conceptual model of digitizing internal business communications based on the integration of budgeting, accounting, and management reporting modules.

Presentation of the primary research material. The implementation of digital technologies into the activities of enterprises, particularly the automation of budgeting, significantly transforms the processes of internal business communications. In the current conditions of globalization of economic processes and the growth of the role of digital management tools, the analysis of such transformations becomes particularly relevant. Research into the impact of digitalization on the communication flows of enterprises allows us to better understand the changes in their business

models, as well as assess the effectiveness of interaction between structural units and other stakeholders.

As world practice shows, automation of business processes provides a significant reduction in the workload of personnel [12]. The introduction of digital management solutions contributes not only to the optimization of resource use, but also to the reduction of administrative burden, increased efficiency of internal business communications, and acceleration of operational activities of enterprises.

In this context, it is advisable to consider the process of implementing budgeting automation as one of the fundamental elements of digitalization of communication processes based on ERP systems. The main functional capabilities of budgeting within the ERP environment include the creation and maintenance of financial models, automatic display of actual data, modeling of alternative development scenarios («what-if analysis»), management of budget regulations, as well as analysis of the achievement of planned financial indicators.

The implementation of an ERP system ensures a gradual transition from traditional approaches to managing production and financial activities to the comprehensive digitalization of business processes. Within the framework of such a transition, key elements of the management system are integrated, in particular, customization of budget models in accordance with the specifics of the enterprise's activities, detailing of actual financial data in real time, formation of management reporting based on budget models using advanced analytics, as well as sales planning taking into account key market indicators.

Customizing the budget model plays a critical role in enhancing the efficiency of internal business communications. It involves defining the main analytical sections both at the level of the enterprise as a whole and at the level of individual structural units. In addition, an important element is the organization of the budget approval procedure using a system of statuses and electronic signatures, which ensures the formalization of the process of internal approval of management documents.

The formation of budget items by income and expenses is carried out with a high level of analytical detail. Continuous monitoring of indicators by product groups (brands and assortment categories), sales channels (partners and distributors), as well as strategic business units (regional offices and production units) is ensured. This approach allows transforming business communication from a chaotic exchange of messages into a structured process of exchanging verified data, which significantly increases the efficiency of enterprise management.

International practice demonstrates that the automation of business processes leads to a substantial reduction in the workload of employees and improves the efficiency of operational management. The implementation of digital management tools not only optimizes resource allocation but also reduces administrative burdens, improves the quality of internal business communications, and accelerates operational activities. In this context, budgeting

automation becomes an important component of enterprise digital transformation, as it integrates financial planning, accounting processes, and managerial reporting into a unified information environment.

Let us consider the process of implementing budgeting automation as a foundation for the digitalization of communication processes based on an ERP system.

The developed conceptual model of digitalization of internal business communications in an enterprise (Figure 1) reflects the logic of transformation of communication processes resulting from the implementation of budgeting automation based on an ERP system. The proposed model integrates the stages of identifying organizational challenges, functional implementation of budgeting modules, and integration of financial data into the management reporting system. A key element of the model is the iterative refinement stage, which ensures the alignment of managerial objectives with the technical capabilities of the information system and supports the continuous improvement of the budgeting model.

Based on the conducted analysis, a three-stage model of digitalization of internal business communications through budgeting automation was developed. The key stages of the proposed model are summarized in Table 1.

The first stage involves identifying organizational and information problems that hinder effective communication between structural units of the enterprise. These problems typically include excessive duration of document approval procedures, a high probability of errors associated with manual data processing, delays in transforming actual financial data for analytical purposes, and the absence of a unified information system supporting managerial decision-making.

The second stage focuses on the functional implementation of budgeting automation within the ERP environment. At this stage, actual financial data are processed within the budgeting model and reflected at different management levels. Advanced analytical tools allow for detailed data analysis, scenario modeling, and computerized management of the budgeting process. As a result, budgeting becomes not only a financial planning tool but also an important mechanism for coordinating communication between organizational units.

The third stage involves the integration of the budgeting model into the enterprise management system. This stage includes the synchronization of actual financial data within managerial documents, the determination of planned financial indicators such as revenues and expenditures, and the planning of sales activities based on key analytical parameters. The integration of budgeting models with management reporting systems enables managers to obtain comprehensive analytical reports and evaluate the achievement of strategic and operational objectives.

An important methodological component of the proposed approach is the refinement stage, which performs the function of feedback between organizational objectives and the technical configuration of the ERP system. This stage ensures the synchronization of managerial goals with

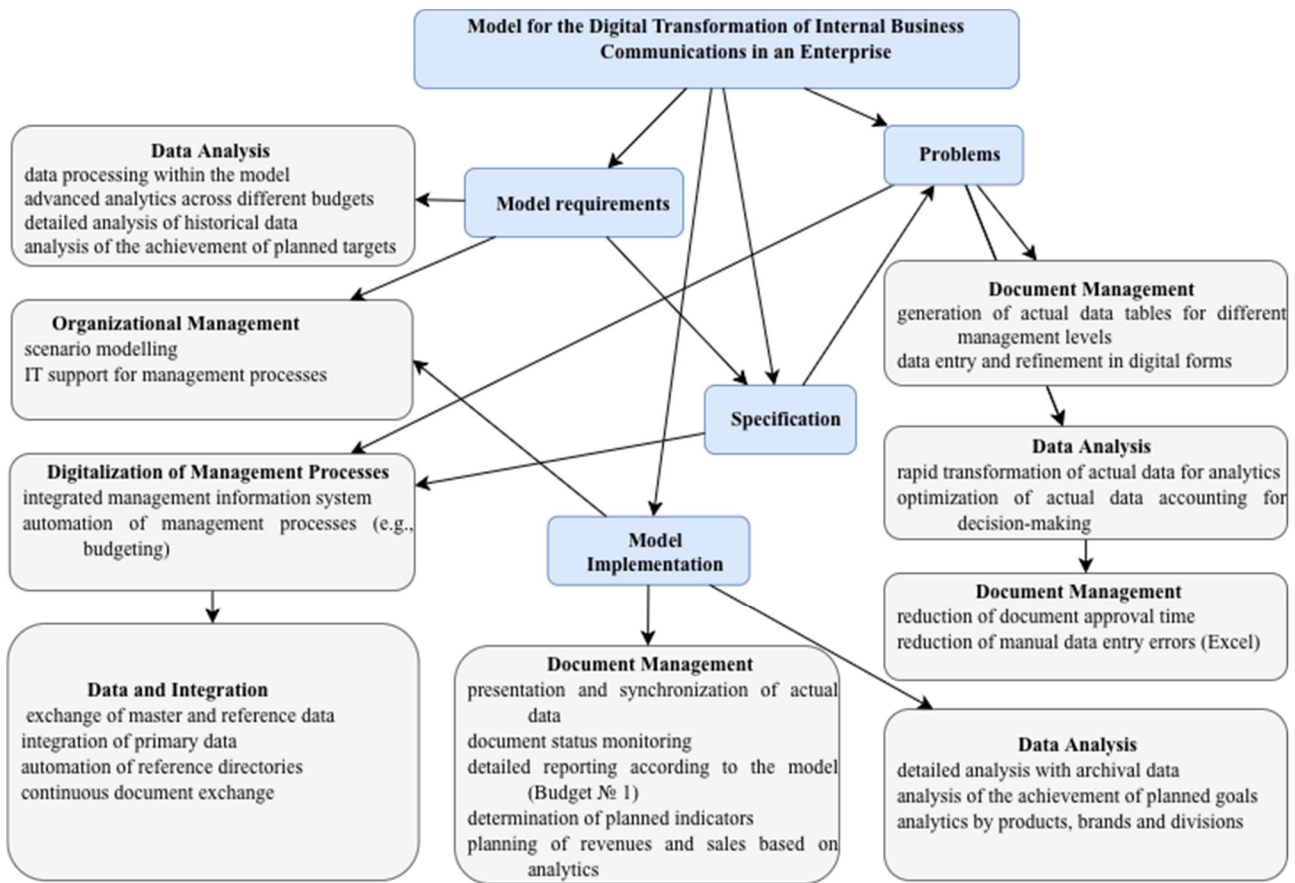


Figure 1 – Conceptual model of digitalization of internal business communications of an enterprise based on budgeting automation

Source: built by the authors

Table 1 – Stages of digitalization of internal business communications through budgeting automation

Stage	Key focus	Managerial effects
Stage 1: Problem identification	Identification of communication gaps, manual data processing issues, fragmented information flows	Understanding organizational inefficiencies and defining automation priorities
Stage 2: Functional implementation	Deployment of budgeting modules, data processing within ERP, analytical modeling and scenario planning	Improved analytical capabilities and structured communication processes
Stage 3: System integration	Integration of budgeting models with management reporting and sales planning	Creation of a unified information environment and enhanced managerial decision-making

Source: compiled by the authors

system capabilities, the unification of analytical directories, and the normalization of primary data. In addition, it supports automated data exchange and facilitates the development of parametric budgeting models that take into account the specific characteristics of different organizational units.

The absence of an effective refinement stage may lead to inconsistencies in analytical indicators and, consequently, to inefficient management processes. By contrast, the iterative refinement approach enables the transformation of heterogeneous data into a coherent enterprise information system, which significantly improves the quality of analytical processing and financial forecasting.

The implementation of ERP-based budgeting automation enables enterprises to obtain detailed financial information regarding revenues and expenditures of structural units, organize centralized planning using a wide range of analytical indicators, transform actual financial data for analytical purposes, and ensure the automation of managerial budgeting processes.

To further illustrate the managerial advantages of ERP-based budgeting automation, a comparative analysis of traditional budgeting approaches and ERP-integrated budgeting systems is presented in Table 2.

The comparative analysis demonstrates that ERP-based budgeting systems significantly enhance the efficiency

Table 2 – Comparison of traditional budgeting and ERP-based budgeting systems

Criterion	Traditional budgeting	ERP-based budgeting
Data processing	Manual data entry, often using spreadsheets	Automated data processing within integrated information systems
Data accuracy	High probability of errors due to manual operations	Reduced errors through automated verification
Data integration	Fragmented data stored in separate files or departments	Unified database integrating financial and operational data
Approval process	Long document approval cycles	Automated workflow with electronic approvals
Analytical capabilities	Limited analytical tools	Advanced analytics and scenario modeling
Communication processes	Informal and unstructured communication	Structured communication based on verified data
Decision-making support	Delayed access to information	Real-time analytical information for management decisions

Source: compiled by the authors

of internal business communications. Unlike traditional budgeting approaches that rely heavily on manual data processing and fragmented information flows, ERP-integrated systems create a unified information environment that supports real-time data exchange, improves analytical capabilities, and accelerates managerial decision-making processes. Consequently, budgeting automation becomes not only a financial planning tool but also a strategic mechanism for coordinating communication between organizational units and improving transparency of managerial processes.

Thus, the implementation of ERP-based budgeting automation forms the technological and organizational basis for the digital transformation of internal business communications and contributes to improving the overall efficiency of enterprise management.

Conclusions. The research yielded the following findings and conclusions.

The study theoretically substantiates and practically confirms the role of budgeting automation as a strategic tool for the digitalization of internal business communications within an enterprise. The analysis of the advantages of implementing enterprise resource planning (ERP) systems demonstrated that the automation of business processes is a necessary prerequisite for the formation of a unified information space within organizations. The integration of budgeting, accounting, and management reporting modules enables the transformation of fragmented communication flows into a structured system of verified data exchange, thereby improving the transparency and efficiency of

managerial decision-making. As a result of the research, a three-stage model of digitalization of internal business communications of an enterprise based on automation of budgeting was developed and formalized.

The study revealed that a key element of the proposed methodological approach is the iterative «refinement» stage, which ensures the alignment of managerial objectives with the technical parameters of the ERP system, supports the unification of directories, and facilitates the normalization of information flows. The analysis of practical aspects of budgeting automation implementation indicates that the use of integrated ERP systems significantly optimizes internal management processes. In particular, such implementation contributes to the reduction of the time required for budget document approval, minimizes errors associated with manual data processing, and improves the timeliness of analytical information used for managerial decision-making.

Furthermore, the practical implementation of budgeting automation enhances the transparency of financial planning, reduces administrative workload for personnel, and improves coordination among organizational units. These improvements create favorable conditions for more efficient resource management and support strategic planning processes in the digital economy. Future research may focus on the integration of intelligent data analysis systems and artificial intelligence algorithms into financial planning, forecasting, and managerial decision-support processes in order to further enhance the effectiveness of enterprise management systems.

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МОДЕЛЬ ЦИФРОВІЗАЦІЇ ВНУТРІШНІХ БІЗНЕС-КОМУНІКАЦІЙ ПІДПРИЄМСТВА НА ОСНОВІ АВТОМАТИЗАЦІЇ БЮДЖЕТУВАННЯ

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Сучасні підприємства функціонують у середовищі постійних динамічних змін та високої невизначеності, що вимагає від менеджменту оперативного доступу до актуальних фінансових даних, прозорості інформаційних потоків та автоматизації процедур погодження управлінських рішень. У дослідженні ERP-систему розглянуто як інтегровану цифрову платформу, що забезпечує формалізацію комунікацій та підтримує комплексне планування фінансових ресурсів. Метою статті є теоретичне обґрунтування та практичний аналіз автоматизації бюджетування як інструменту діджиталізації внутрішніх ділових зв'язків організації, а також визначення організаційно-управлінських ефектів її впровадження. Доведено, що переведення внутрішніх комунікацій у цифровий формат на основі бюджетних модулів дозволяє трансформувати традиційні неформалізовані потоки у структуровану систему обміну верифікованими даними, мінімізуючи вплив людського фактора. Обґрунтовано, що глибока інтеграція функцій бюджетування з обліковими та аналітичними підсистемами ERP забезпечує автоматичне відображення фактичних показників у режимі реального часу, підтримує багатоваріантне сценарне моделювання та суттєво скорочує часові витрати на затвердження управлінської документації. Наукова новизна дослідження полягає у розробленні та обґрунтуванні авторської триетапної моделі цифровізації внутрішніх бізнес-комунікацій на основі впровадження ERP-рішень. На відміну від існуючих підходів, запропонована модель містить специфічний ітераційний етап «уточнення», який забезпечує дворівневе узгодження стратегічних цілей підприємства з технічними параметрами інформаційної системи. Це включає уніфікацію довідників, нормалізацію великих масивів даних та автоматизацію обміну нерегулярними статтями витрат. Такий підхід підвищує релевантність інформації та дозволяє інтегрувати бюджетні моделі із системами управлінської звітності. Практичне значення отриманих результатів полягає у формуванні універсального, масштабованого підходу до модернізації управлінських процесів. Реалізація запропонованої моделі сприяє створенню єдиного інформаційного простору, мінімізації ручної обробки даних та оптимізації крос-функціональної взаємодії між структурними підрозділами організації, що у сукупності підвищує її стратегічну гнучкість та конкурентоспроможність.

Ключові слова: ERP-системи, автоматизація бюджетування, діджиталізація внутрішніх комунікацій, управлінські рішення, цифрова трансформація бізнес-процесів.

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