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METHODOLOGICAL ASPECTS OF DIGITAL SYSTEMS IMPLEMENTATION BASED ON BUSINESS PROCESS MODELING IN CREATIVE INDUSTRY ENTERPRISES

The article examines methodological aspects of implementing digital systems in creative industry enterprises based on business process modelling. In the digital economy, enterprises in this sector operate in an environment characterized by intensive use of information resources, a high proportion of intangible assets, and project-based activities, necessitating modern digital management systems. It has been established that the use of disparate information systems leads to data fragmentation, duplicate operations, reduced transparency in business processes, and decision-making complications.

As a result of the study, the main problems in the IT infrastructure of creative industry enterprises that hinder effective digital transformation were analysed: fragmentation of information systems, insufficient data integration, limited operational automation, and limited analytical support for management. The feasibility of using ERP systems as an integrated digital platform for managing an enterprise's business processes is justified.

An optimised model for managing the IT infrastructure of a creative industry enterprise has been developed using IDEF0 notation, which systematises the main functions of digital management and ensures the interconnection between the planning, implementation, control, and improvement stages of digital processes. A model of the business process for ERP system implementation in EPC notation has also been constructed, reflecting the sequence of stages in digital project implementation – from determining the enterprise's needs to industrial operation and further system development. The practical value of the results lies in the ability to use the proposed process models to plan and implement digital transformation projects in creative industries, thereby improving the efficiency of business process management, automating operational activities, and strengthening enterprise competitiveness in the digital economy.

Keywords: digital management systems, ERP systems, business processes, business process modelling, digital transformation, creative industries, IT infrastructure.

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МЕТОДИЧНІ АСПЕКТИ ВПРОВАДЖЕННЯ ЦИФРОВИХ СИСТЕМ НА ОСНОВІ МОДЕЛЮВАННЯ БІЗНЕС-ПРОЦЕСІВ НА ПІДПРИЄМСТВАХ КРЕАТИВНИХ ІНДУСТРІЙ

У статті досліджено методичні аспекти впровадження цифрових систем на підприємствах креативних індустрій на основі моделювання бізнес-процесів. В умовах цифрової економіки підприємства цієї сфери функціонують у середовищі інтенсивного використання інформаційних ресурсів, високої частки нематеріальних активів та проєктного характеру діяльності, що зумовлює необхідність застосування сучасних цифрових систем управління. Встановлено, що використання розрізнених інформаційних систем призводить до фрагментації даних, дублювання операцій, зниження прозорості бізнес-процесів і ускладнення прийняття управлінських рішень.

У результаті дослідження проаналізовано основні проблеми IT-інфраструктури підприємств креативних індустрій, що перешкоджають ефективній цифровій трансформації, зокрема фрагментацію інформаційних систем, недостатній рівень інтеграції даних, низьку автоматизацію операцій та обмежені можливості аналітичної підтримки управління. Обґрунтовано доцільність використання ERP-систем як інтегрованої цифрової платформи для управління бізнес-процесами підприємства.

Розроблено оптимізовану модель управління IT-інфраструктурою підприємства креативної індустрії з використанням нотації IDEF0, що дозволяє систематизувати основні функції цифрового управління та забезпечити взаємозв'язок між етапами планування, реалізації, контролю та вдосконалення цифрових процесів. Також побудовано модель бізнес-процесу впровадження ERP-системи у нотації EPC, яка відображає послідовність етапів реалізації цифрового проєкту – від визначення потреб підприємства до промислової експлуатації та подальшого розвитку системи.

Практична цінність отриманих результатів полягає у можливості використання запропонованих процесних моделей для планування та реалізації проєктів цифрової трансформації підприємств креативних індустрій, що сприятиме підвищенню ефективності управління бізнес-процесами, автоматизації операційної діяльності та зміцненню конкурентоспроможності підприємств у цифровій економіці.

Ключові слова: цифрові системи управління, ERP-системи, бізнес-процеси, моделювання бізнес-процесів, цифрова трансформація, креативні індустрії, IT-інфраструктура.

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STATEMENT OF THE PROBLEM

In the modern digital economy, the digital transformation of enterprises operating in the creative industries is becoming increasingly important [8]. This sector includes enterprises whose activities are based on the creation and commercialisation of intellectual products, creative ideas, cultural content, and innovative design solutions. Unlike traditional manufacturing industries, enterprises in the creative industries are characterised by a high share of intangible assets, a project-based nature of activities, intensive use of information resources, and the need for rapid interaction between creative teams, managers, and clients. Under such conditions, the effectiveness of enterprise management largely depends on the level of digitalisation of business processes and the use of modern information systems [3; 12].

The rapid development of digital technologies and the growing volume of information flows necessitate the formation of an integrated information environment within enterprises [2] to ensure the coordination of managerial decisions, operational data exchange, and transparency in business processes. For enterprises in the creative industries, this issue is particularly significant, as their activities often involve implementing numerous short-term projects, collaborating with various stakeholder groups, and coordinating creative, managerial, and operational processes continuously.

At the same time, many enterprises in the creative industries rely on fragmented information systems [2; 5] that perform only individual management functions, such as accounting, document management, inventory control, or customer relationship management. Such fragmentation of digital infrastructure leads to data duplication, increased manual operations, slower information exchange, and difficulties in generating managerial analytics. As a result, enterprise management often faces problems of insufficient transparency into business processes, limited access to operational information for decision-making, and reduced resource efficiency.

Moreover, the development of the digital economy increases enterprises' requirements for responsiveness to market changes, individual customer demands, and innovation challenges. Under these conditions, traditional approaches to organising enterprises' information infrastructure become ineffective. This necessitates implementing integrated digital management systems, including ERP, CRM, and other corporate information systems [4; 5; 14], capable of ensuring comprehensive automation of business processes and a unified enterprise information environment.

However, implementing digital management systems is a complex organisational and technological process [1; 7; 6] that requires a systematic approach to analysing the current state of the IT infrastructure, modelling business processes, selecting appropriate software solutions, and organising the implementation. Insufficient methodological justification of these processes may lead to increased costs, delays in implementing IT projects, and a mismatch between the results and the enterprise's expectations.

In this regard, an important scientific task is to substantiate the methodological aspects of implementing digital systems in creative industry enterprises and to develop process models that systematise the stages of enterprise digital transformation and improve the efficiency of managing its information infrastructure.

THE PURPOSE OF THE RESEARCH

The aim of the article is to substantiate the methodological aspects of implementing digital systems in creative industry enterprises and to develop process models for managing IT infrastructure and implementing ERP systems as a tool for enterprise digital transformation.

PRESENTATION OF THE MAIN RESEARCH MATERIAL

Digital management systems, including ERP, CRM, and analytical platforms, ensure data integration, business process automation, increased transparency of management decisions, and optimized resource utilization [2; 4]. For companies in the creative industries, the implementation creates opportunities for effective project management, coordination of creative teams, control of order fulfillment, management of financial flows, and performance analysis. At the same time, the implementation of digital systems requires a comprehensive methodological approach that combines analysis of the current state of IT infrastructure, business process modeling, selection of the optimal software solution, and assessment of the economic efficiency of its use [3; 12]. The modern development of an enterprise is impossible without an effective, integrated IT infrastructure that ensures data transparency, rapid decision-making, and high operational efficiency. Existing information systems perform only basic functions and do not provide the necessary level of integration between departments. This leads to operational duplication, data fragmentation, low automation, and staff overload with routine tasks. The identified problems require a systematic approach to modernizing the IT environment, the key element of which is implementing an ERP system (Table 1).

Table 1

Key challenges for creative industries and IT infrastructure companies and ways to address them

Problem	Solutions
Lack of a unified ERP system, leading to fragmented information and duplication of operations	Implementation of an integrated ERP system that will combine all key business processes (finance, warehousing, procurement, logistics, sales) in a single information environment
Fragmented data and weak integration between departments	Creation of a centralized database and unified reference books, configuration of automated information exchange and end-to-end business processes
Prevalence of local systems and file server storage	Transition to a modern server or hybrid cloud infrastructure with extensive integration capabilities and centralized management
Growing dependence on external IT contractors and shortage of in-house IT resources	Reducing the need for external support through a standardized ERP solution, implementation of service level agreements (SLAs), and gradual development of in-house competencies
Limited analytical support for management and lack of operational reporting	Implementation of ERP analytics and management reporting modules (Dashboard, BI) that provide real-time analysis of key performance indicators
High requirements for information security and access control	Centralization of security policies, separation of roles and access in ERP, automation of control and backup
Low automation of routine operations and staff overload	Automation of operational procedures within ERP, reduction of data re-entry, formation of electronic document flow
Slowing down of management processes due to manual operations and fragmentation of systems	Optimization of business processes, implementation of end-to-end scenarios for procedures in ERP

At the same time, the problems of digital integration are particularly acute for creative industries. This is due to the project-based nature of their activities, the need for constant interaction among creative teams, designers, managers, and customers, and the high proportion of intangible assets and intellectual property. In such conditions, digital systems perform not only accounting or operational functions but also serve as tools for coordinating creative processes, managing projects, controlling order fulfilment, and analysing the effectiveness of creative products.

An analysis of the main problems of the IT infrastructure of creative industry enterprises, summarised in the table, shows that the current state of the enterprise's information systems does not meet the current requirements of the digital economy and the modern model of business process management. Throughout the company's history, the information environment has evolved primarily through the introduction of individual software solutions for accounting, warehouse logistics, finance, document management, and other operations. This approach enabled basic automation of functional areas, but it also created systemic shortcomings that are now hindering further development and scaling of activities. In particular, the key problem that underlies most of the other shortcomings is the lack of an integrated ERP system that would combine the enterprise's main business functions in a single digital environment.

The lack of a centralised management platform leads to fragmented information resources, data duplication, and the need to perform many routine operations manually. Each department works with its own information base, set of programs, and local services, which complicates coordination and reduces the efficiency of data exchange. For example, information about purchases, sales, inventory, contractors, or order fulfilment may be stored in different systems and require multiple duplications, which not only increases unnecessary work but also creates risks of errors, discrepancies, and data irrelevance. In turn, such fragmentation complicates the formation of a complete picture of the enterprise's state, which is critical for operational management, strategic planning, and increasing competitiveness.

Another significant problem is weak integration between structural units. In the traditional enterprise model, information flows pass through separate systems and communication channels, which increases data processing time and slows down decision-making. In the context of growing market dynamics, increased competition, and rising operational volume, this model is becoming less effective. Modern enterprises operate in an environment where the time it takes to respond to market changes, customer requests, or internal deviations directly affects their stability and profitability. The lack of an integrated management system makes this process slow and dependent on the human factor, reducing the reliability of information exchange and increasing the likelihood of critical errors.

The prevalence of local systems and file-server data storage models is another consequence of the lack of a centralised IT architecture. On the one hand, such a model is easy to implement and requires only a modest initial investment. However, as data volumes grow, so do the requirements for availability, security, and backups, making such infrastructure outdated and restrictive. Basing the enterprise's operations on local servers complicates integration with external services, remote access, and internal support and maintenance. As a result, the load on the IT department increases, while the speed of change implementation decreases.

An additional challenge is the dependence on external IT contractors. When a company uses several disparate systems that require updates, upgrades, and support, managing the IT landscape becomes complex and expensive. If it lacks its own specialists, the company is forced to engage external service providers, which creates risks of delays, additional costs, and dependence on third-party organisations. At the same time, the market for IT specialists is highly competitive, which can complicate access to specialists capable of developing the company's local systems. Thus, the existing model is not sustainable in the long term.

Another important problem is the limited analytical support for management. The lack of a unified database means reporting can only be done manually or with a set of incompatible tools, which complicates trend analysis, forecasting, and the control of key performance indicators. In today's environment, enterprises need operational

analytics that allow them to monitor the state of the business in real time and respond quickly to changes in the external and internal environment. Without the ability to obtain reliable management data in a timely manner, management is forced to rely on assumptions or outdated information, which reduces the quality of decisions and increases uncertainty.

Information security issues are also critically important. When data is stored in different databases, on local servers, or even on employees' personal computers, it becomes almost impossible to ensure centralised access control. This creates risks of unauthorised access, loss, damage, or compromise of important information. In addition, manual or non-automated backups cannot guarantee adequate protection or data recovery in emergencies. Modern information security standards require a high level of automation, clear access and control procedures, event logging, and a systematic approach to building protective mechanisms, which requires an appropriate digital platform.

All these issues directly affect staff productivity. Low levels of automation of routine operations lead to employee overload, increase the time required to perform functional tasks, and reduce their efficiency. Employees spend a significant portion of their working time duplicating data, manually generating documents, approving requests, and searching across various sources for information. This limits the company's ability to scale quickly, slows customer service, and hinders innovation.

All these problems have one thing in common: they are systemic, complex, and interrelated. Solving them requires not isolated local upgrades, but a transition to an integrated digital platform. An ERP system is the optimal solution to address the identified shortcomings and to form a modern management model. Its implementation allows you to combine all key business functions into a single information environment, provide centralised access to data, eliminate information duplication, and create end-to-end processes for performing operations “from order to shipment.” ERP provides automated management analytics, advanced planning capabilities, performance monitoring tools, and increased information transparency. In addition to operational efficiency, ERP implementation helps strengthen the enterprise's competitiveness. In a market environment where the speed of response to change and the level of customer service are decisive factors for success, an integrated system reduces decision-making time, reduces errors, improves the predictability of results, and lays the foundation for further digital transformation. The ERP system serves as the foundation for implementing modern tools such as BI dashboards, automated monitoring systems, predictive analytics, inventory optimisation, risk management, and others, enabling the strategic development of the enterprise.

Thus, a detailed analysis of the issues shows that implementing an ERP system in creative industries is not just a modernisation of the information infrastructure, but a key strategic step to improve the efficiency, manageability, and sustainability of the enterprise. Business process modeling in this study is based on the IDEF0 functional modeling methodology [3].

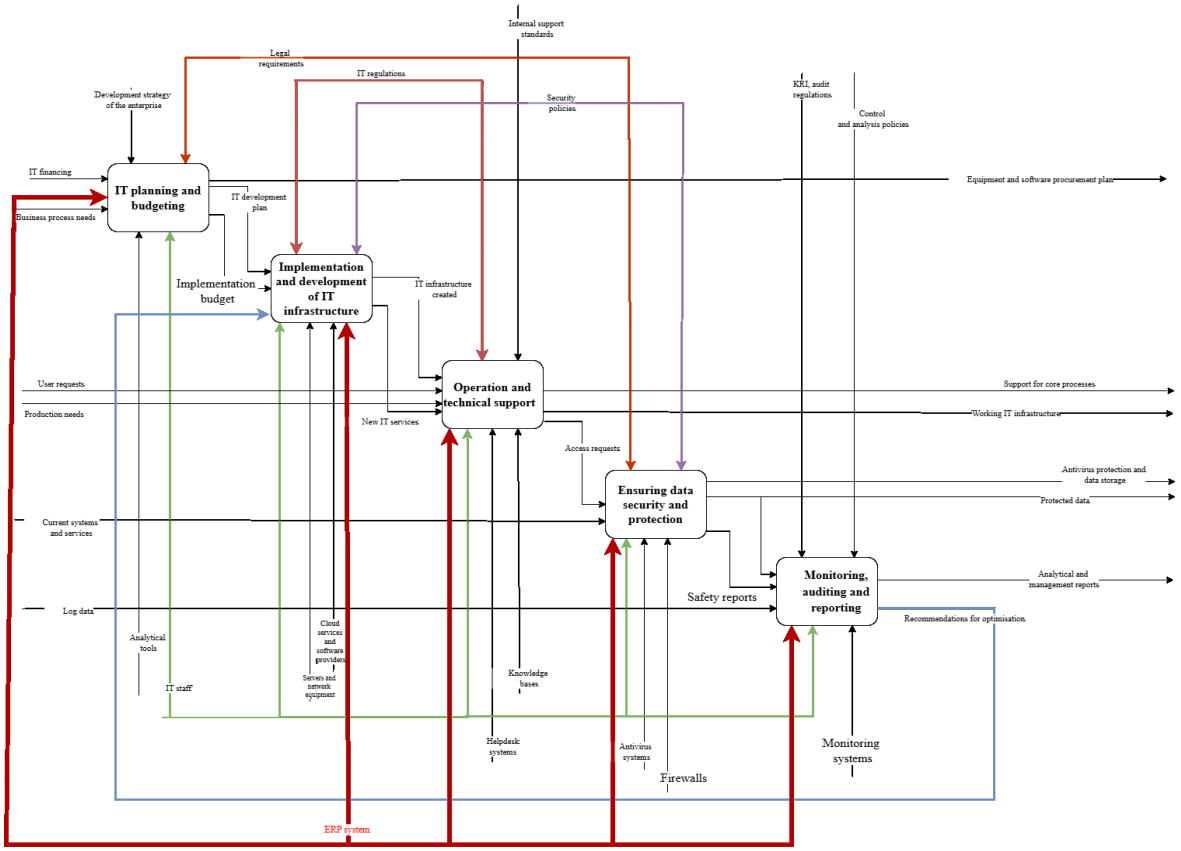

Fig. 1. Optimized model of the business process of managing the IT infrastructure of a creative industry enterprise in IDEF0 notation
Source: developed by the author

This decision will eliminate systemic shortcomings, ensure centralised process management, increase staff productivity, expand management's information capabilities, and create a technological foundation for the company's continued growth and market competitiveness. That is why an optimised business process for IT infrastructure management has been developed (Fig. 1). In Fig. 1, the elements highlighted in red indicate the recommended modifications to the IT infrastructure management process arising from the implementation of the proposed digital system.

An analysis of the ERP system's role across all stages of the IT process management life cycle shows that it is a key element of the enterprise's modern digital infrastructure. In the initial stages of needs assessment and planning, ERP provides access to the necessary data and serves as a tool for analytics and informed decision-making. This allows the enterprise to more accurately identify problems, priorities, and requirements for developing the IT environment.

During the implementation of digitalisation projects, ERP is the primary technical platform for implementing modules, configuring integrations, and automating business functions. At the operational stage, it becomes a working environment for staff and a platform for the main exchange of information and the recording of operations.

At the final stage of monitoring and improvement, ERP provides data aggregation, KPI definition, and analytical reports necessary for monitoring effectiveness and decision-making on the further development of automation. Thus, an ERP system is not limited to technical functions — it is integrated into the entire IT and business process management cycle, creating a basis for synchronising operations, increasing efficiency, enhancing strategic transparency, and boosting the enterprise's competitiveness.

To illustrate the business process for implementing an ERP system in a creative industry enterprise, a business process model was developed using EPC notation [9; 11] (Fig. 2-6).

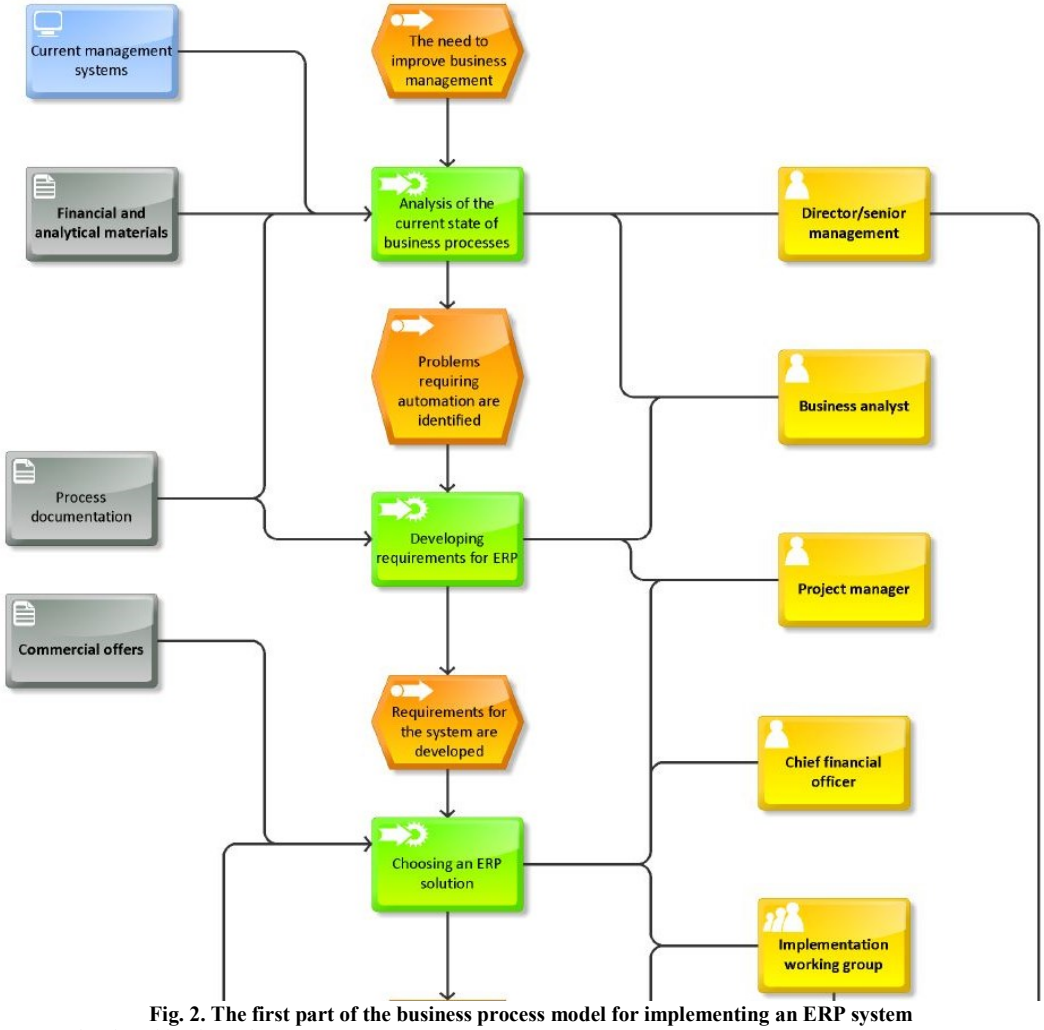

Fig. 2. The first part of the business process model for implementing an ERP system

Source: developed by the author

The first part of the ERP system implementation business process model outlines a logical, consistent preparatory phase aimed at identifying real business needs and defining reasonable requirements for the future solution. The process begins by identifying the need to improve company management, which aligns with the strategic guidelines and is reinforced by an analysis of the current state of business processes. At this stage, various data sources are involved – documents, financial and analytical information, and materials from existing accounting systems.

The analysis identifies key issues that need to be automated, such as duplicate operations, low transparency of functions, slow data access, or data fragmentation. This allows us to move on to defining requirements for the ERP system, where business analysts, project managers, and other participants clarify the solution's functional and technical expectations. External factors are also taken into account in the process: supplier commercial offers, budgetary constraints, IT constraints, and company regulations.

After summarisation, the requirements are agreed upon and finalised, which creates the basis for the next step—the selection of a specific ERP solution. Thus, the first part of the model is characterised by in-depth work in collecting, systematising, and interpreting information, which provides a thorough and objective basis for subsequent project implementation and minimises the risk of selecting the wrong system or setting unrealistic expectations.

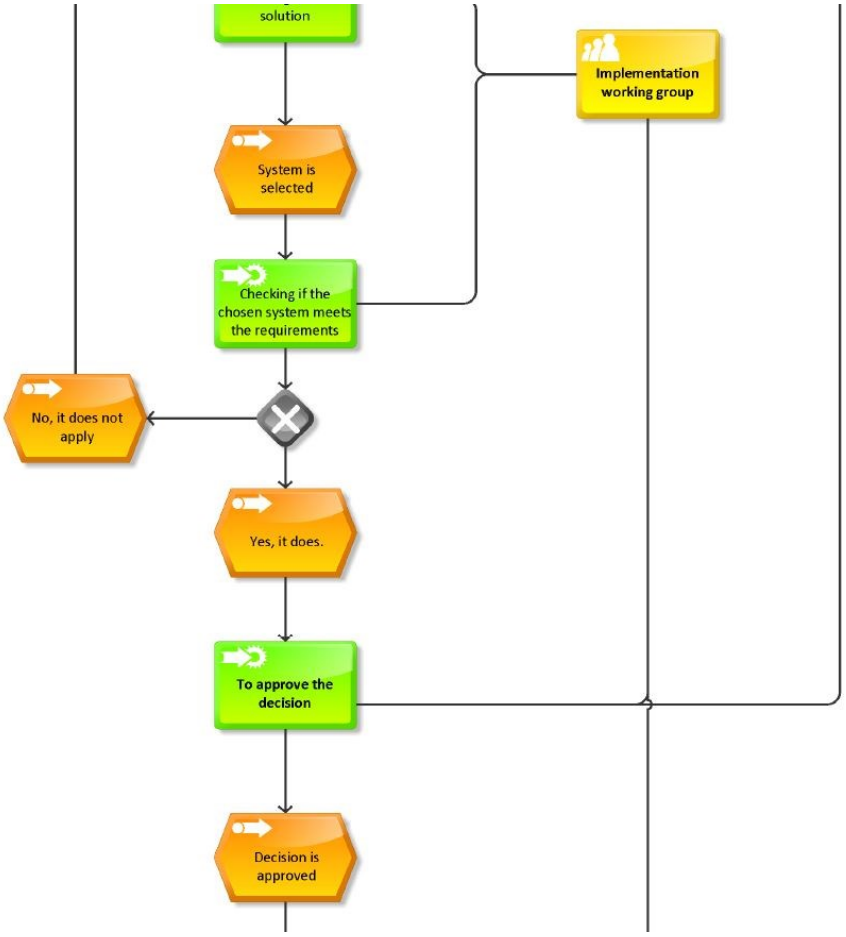

Fig. 3. The second part of the business process model for implementing an ERP system
Source: developed by the author

At this stage of the business process, the procedure for evaluating and selecting an ERP solution is completed. After the working group analyzes the options and determines the most suitable system, the selected solution is checked for compliance with the established requirements. If the system does not meet the criteria, the process returns to the previous stage for re-analysis and the selection of another option, ensuring the quality of the choice and minimising the risk of error. If the solution meets the criteria, it is agreed upon with management. The final decision by management ensures that IT development is aligned with the corporate strategy, the enterprise's financial capabilities, and its priorities. This completes the ERP system selection stage, and the company moves on to the next phase—direct implementation. This stage plays a key role, as it determines whether the implemented solution will solve existing problems, deliver the expected business impact, and ensure transparency, control, and accountability in management decision-making.

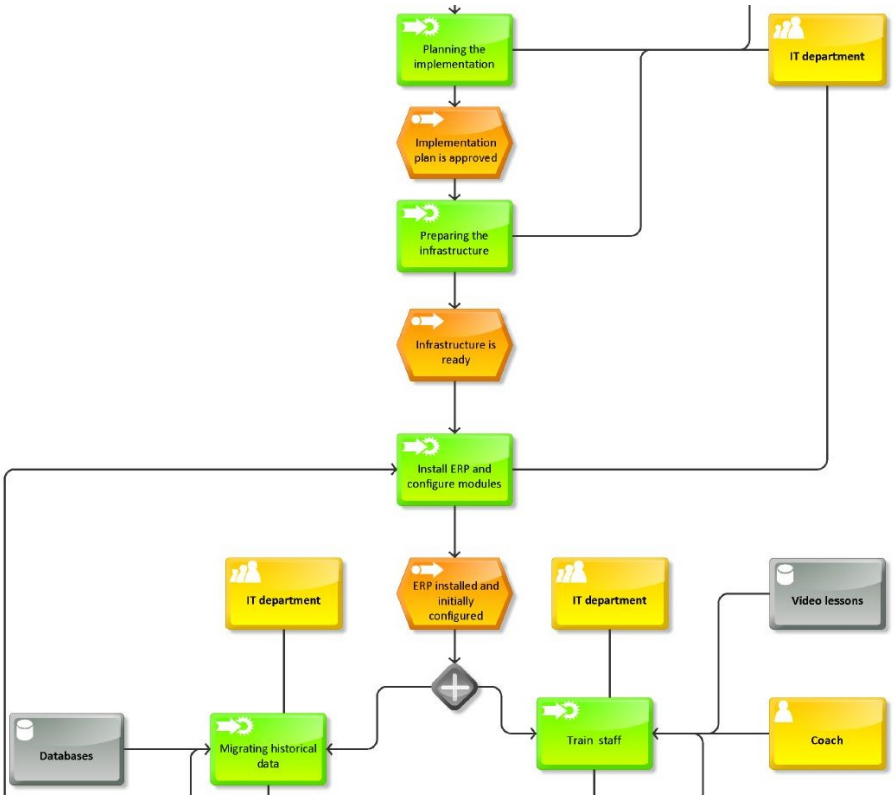

Fig. 4. The third part of the business process model for implementing an ERP system

Source: developed by the author

The test phase of ERP system implementation is critical for bringing the solution into stable industrial operation. It is at this stage that the company gets its first realistic idea of how the system works in real business processes, as well as possible limitations, errors, and inconsistencies. Conducting a full-fledged test operation allows not only to verify the technical correctness of settings, the quality of historical data transfer and integrations, but also to assess the readiness of personnel for everyday work in a new software environment.

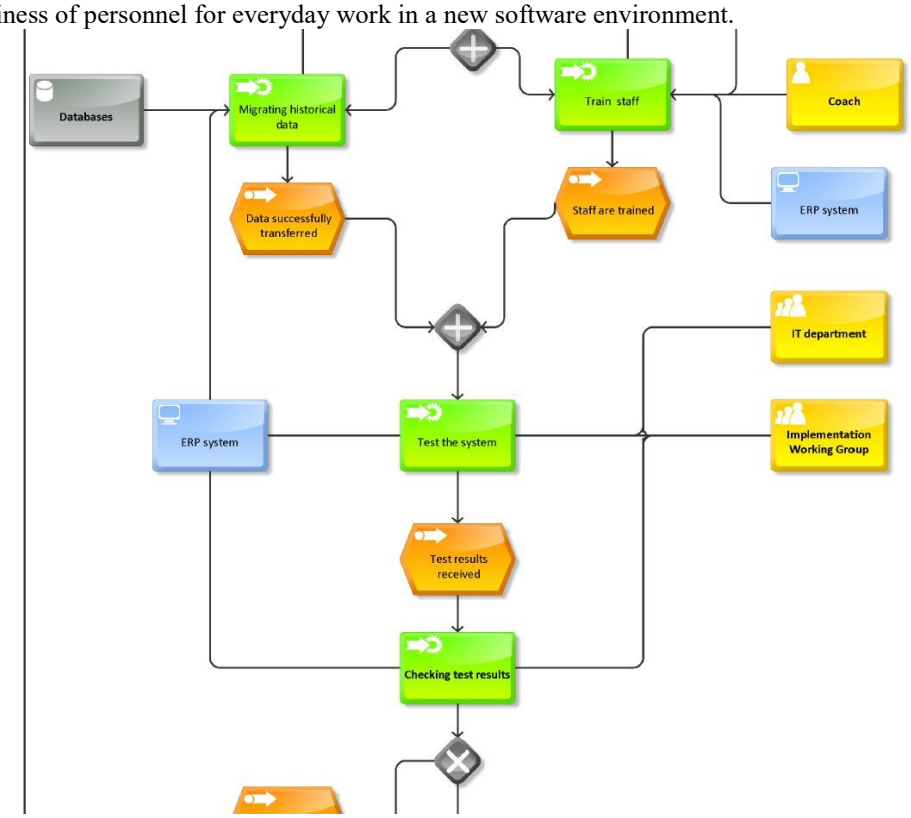

Fig. 5. The fourth part of the business process model for implementing an ERP system

Source: developed by the author

Analysis of the results provides a basis for decision-making and for determining priorities for further development. The working group, IT department, and key users can identify weaknesses, compile a list of functional shortcomings, clarify requirements, and adjust the system configuration. It is important that, during this period, not only technical improvements are made, but also the enterprise's internal regulations and procedures are adapted to the new digital logic.

After the shortcomings have been eliminated, the system undergoes a re-check, which confirms its stability, the completeness of its configuration, and compliance with the expected business results. Only if the results are positive is a decision made to transfer the ERP system to industrial use. Thus, the testing stage serves as a guarantee of risk minimisation, ensures a smooth transition for users to working with the new information platform, and increases the likelihood of a successful ERP implementation across the enterprise.

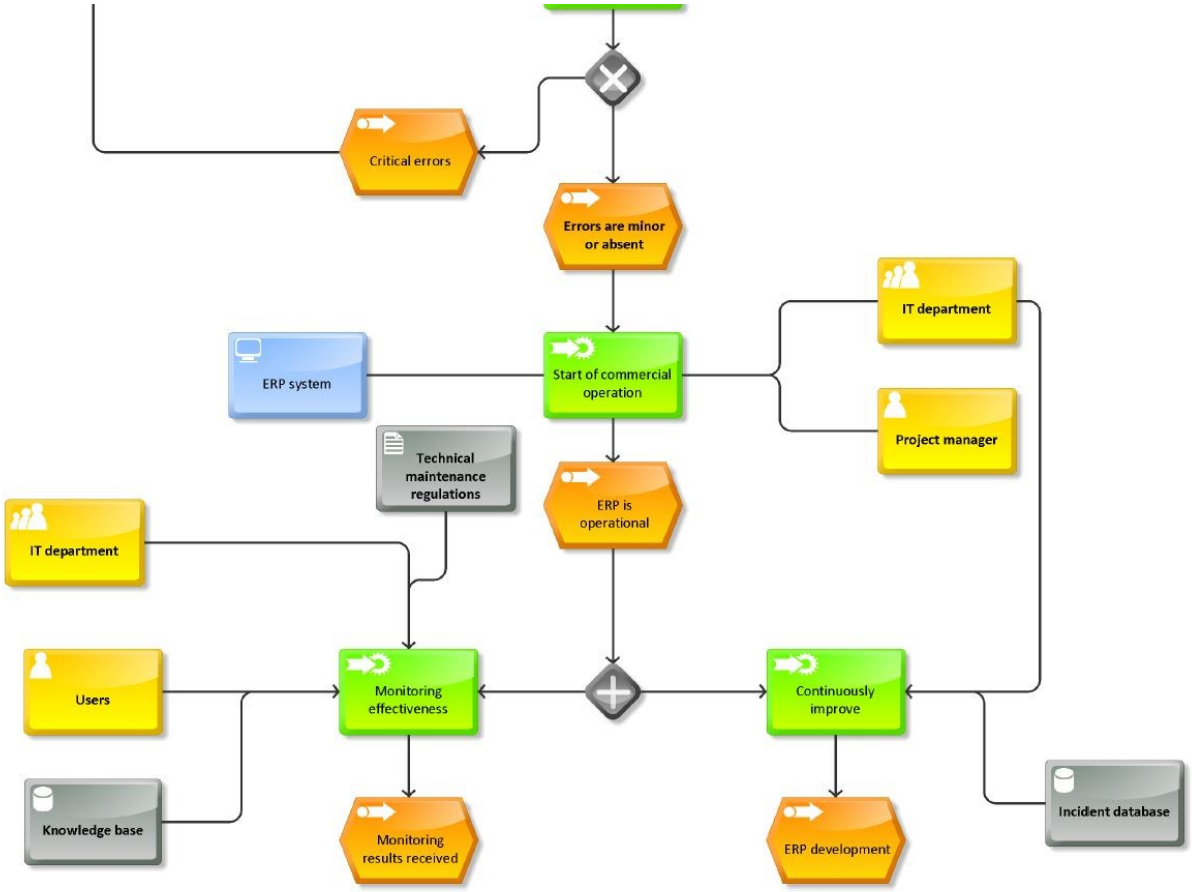

Fig. 6. The fifth part of the business process model for implementing an ERP system
Source: developed by the author

The fifth part of the model reflects the final and longest stage of the ERP system implementation life cycle – its industrial operation and continuous improvement. At this stage, the system officially goes live, and the key tasks become performance monitoring, user support, maintenance, incident response, and functionality optimisation.

After a successful launch, the system operates continuously, providing users with access to corporate data and automated business processes. The IT department plays a key role in support: it monitors system status, tracks technical indicators, handles incidents, and manages the knowledge base for implemented solutions. Users, for their part, provide feedback that helps us assess how much the system increases productivity and advances the company's digital transformation goals.

An important result of this stage is obtaining analytical information about the effectiveness of ERP and identifying new business needs. This creates a closed cycle of improvement: monitoring results are analysed, areas for improvement are identified, and the system is updated, continuing to evolve in line with changes in the market, processes, and company strategy.

Therefore, according to the model's final part, ERP implementation does not end with its launch — the system's effectiveness is ensured only through regular monitoring, support, and flexible improvement, which transform ERP into a dynamic tool for the continuous development of the enterprise.

CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The conducted research confirms that the digital transformation of enterprises in the creative industries requires a systematic approach to organising their information infrastructure and managing business processes. The study showed that many enterprises in this sector operate in fragmented digital environments characterised by separate information systems, data duplication, and a significant number of manual operations. Such conditions reduce the transparency of business processes, complicate managerial decision-making, and limit the efficiency of resource utilisation.

The analysis of the current state of IT infrastructure in creative industry enterprises demonstrated that the lack of integrated digital platforms is a key constraint on improving operational efficiency and ensuring sustainable organisational development. Under these conditions, the implementation of integrated digital systems, particularly ERP systems, becomes a strategically important tool for building a unified information environment and supporting enterprises' digital transformation.

Within the study, the methodological aspects of implementing digital systems in creative industry enterprises were substantiated. Special attention was paid to the role of business process modelling as an instrument for analysing organisational procedures, identifying operational inefficiencies, and designing effective digital management solutions. The application of process modelling approaches allows enterprises to systematise the stages of digital transformation and ensure a structured implementation of information systems.

As a result of the research, an optimised model of the IT infrastructure management business process was developed using the IDEF0 notation. This model reflects the functional structure of managing digital infrastructure and demonstrates the interconnection between planning, implementation, monitoring, and improvement processes within the enterprise. In addition, a detailed business process model of ERP system implementation was constructed using EPC notation, describing the sequence of stages from identifying the need for digital transformation through system implementation and industrial operation to further development.

The proposed process models enable formalising the stages of digital system implementation, improving transparency in project management, reducing the risks associated with selecting and implementing ERP solutions, and increasing the overall efficiency of enterprise management. For enterprises in the creative industries, characterised by project-based activities and intensive interaction between various stakeholders, the use of business process modelling becomes an important factor in improving coordination and organisational effectiveness.

The practical significance of the obtained results lies in the possibility of applying the proposed methodological provisions and process models in the development and implementation of digital transformation projects in creative industry enterprises. Their application contributes to improving the efficiency of business process management, increasing the level of automation of operational activities, enhancing the quality of managerial analytics, and strengthening the competitiveness of enterprises in the digital economy.

Prospects for further research include the development of quantitative approaches to assessing the effectiveness of digital systems implementation, as well as the expansion of methodological tools for modelling and optimising business processes in enterprises operating in the creative industries.

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