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Intelligent Business Process Management Based on Artificial Intelligence as a Factor of Innovative Development of the Enterprise

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Abstract. *The article examines the theoretical and applied aspects of integrating artificial intelligence into business process management (BPM) in the context of digital transformation. Digital transformation is substantiated as a paradigm shift in management logic that transforms value creation mechanisms, business models, and decision-making principles, while BPM serves as the infrastructural basis for these changes. It is shown that AI integration enables a transition to cognitive-adaptive management, in which business processes acquire the capacity for self-learning, forecasting, and dynamic adjustment. Key trends in digitalization are identified, including data-driven management, ecosystem business models, and continuous innovation. In this context, enterprises are increasingly viewed as open adaptive systems operating within digital ecosystems, where value creation is based on data exchange, network interaction, and continuous analytical support. The main barriers to AI integration into BPM are systematized, including infrastructural fragmentation, low data quality, organizational inertia, and lack of competencies. Their systemic interdependence is substantiated, demonstrating that implementation effectiveness depends on the coherence of management system components. It is emphasized that the imbalance between technological capabilities, process architecture, and managerial practices significantly reduces the effectiveness of intelligentization and transformation processes. A conceptual model of AI integration is developed, reflecting the transition from automation to intelligent management, together with a mechanism for its implementation based on systemic integrity, phased development, and adaptability. The model highlights the importance of synchronizing digital infrastructure, data management systems, and business processes as a prerequisite for effective AI deployment. It is substantiated that the model ensures intelligent-adaptive efficiency, improves decision-making quality, enables proactive management, and strengthens enterprise innovative capacity, shaping a new quality of modern management.*

Keywords: *digital transformation; artificial intelligence; business process management; BPM; intelligent management; data-driven management; innovative development; business processes; digital economy; adaptive management.*

JEL Classification: *O33, M11, L23, M15, O31*

Інтелектуальне управління бізнес-процесами на основі штучного інтелекту як фактор інноваційного розвитку підприємства

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***Анотація.** У статті досліджено теоретичні та прикладні аспекти інтеграції штучного інтелекту в систему управління бізнес-процесами (BPM) в умовах цифрової трансформації. Цифрову трансформацію обґрунтовано як парадигмальний зсув у логіці управління, що трансформує механізми створення цінності, бізнес-моделі та принципи прийняття рішень, тоді як BPM виступає інфраструктурною основою цих змін. Показано, що інтеграція штучного інтелекту забезпечує перехід до когнітивно-адаптивного управління, в межах якого бізнес-процеси набувають здатності до самонавчання, прогнозування та динамічного налаштування. Визначено ключові тенденції цифровізації, зокрема data-driven management, екосистемні бізнес-моделі та безперервні інновації. У цьому контексті підприємства дедалі більше розглядаються як відкриті адаптивні системи, що функціонують у цифрових екосистемах, де створення цінності базується на обміні даними, мережевій взаємодії та безперервній аналітичній підтримці. Систематизовано основні бар'єри інтеграції штучного інтелекту в BPM, зокрема інфраструктурну фрагментарність, низьку якість даних, організаційну інерцію та дефіцит компетенцій. Обґрунтовано їх системну взаємозалежність, що доводить: ефективність впровадження залежить від узгодженості компонентів управлінської системи. Наголошено, що дисбаланс між технологічними можливостями, архітектурою процесів та управлінськими практиками суттєво знижує ефективність інтелектуалізації та трансформаційних процесів. Розроблено концептуальну модель інтеграції штучного інтелекту, яка відображає перехід від автоматизації до інтелектуалізованого управління, а також запропоновано механізм її реалізації на засадах системної цілісності, поетапності та адаптивності. Модель підкреслює важливість синхронізації цифрової інфраструктури, систем управління даними та бізнес-процесів як передумови ефективного впровадження AI. Обґрунтовано, що впровадження моделі забезпечує формування інтелектуально-адаптивної ефективності, підвищує якість управлінських рішень, забезпечує проактивне управління та посилює інноваційну спроможність підприємства, формуючи нову якість сучасного менеджменту.*

***Ключові слова:** цифрова трансформація; штучний інтелект; управління бізнес-процесами; BPM; інтелектуалізоване управління; data-driven management; інноваційний розвиток; бізнес-процеси; цифрова економіка; адаптивне управління.*

1 Introduction

The contemporary global economy is shaped by digitalization, globalization, and growing uncertainty, which make innovation a key factor of enterprise competitiveness and resilience. Digital transformation is becoming systemic, encompassing all management levels, while its core lies in artificial intelligence integration, which shifts decision-making from reactive to proactive logic based on data and forecasting. The synergy of BPM and AI enables adaptive, cognitively oriented management systems capable of self-learning and dynamic process optimization, allowing digital

transformation to be interpreted as a strategic mechanism of innovative development.

These processes are especially important for transition economies, particularly Ukraine, where digitalization acts both as a driver of growth and as an instrument of structural modernization and global integration.

Digital transformation, innovation management, and artificial intelligence are actively examined in contemporary economic science. Significant contributions were made by M. Porter [1, p. 45], E. Brynjolfsson and A. McAfee [2, p. 112], who substantiated the impact of digital technologies on

business model transformation and competitive advantage. AI integration into business processes is addressed in the works of T. Davenport [3, p. 88], R. Kaplan [4, p. 210], and J. Manyika [5, p. 34], while BPM is represented in the works of M. Hammer and J. Champy [6, p. 156] and W. van der Aalst [7, p. 92], who emphasize the process approach as a basis for improving enterprise performance.

Despite this body of research, academic discourse remains fragmented in its treatment of the relationship between digital transformation, AI integration, and innovative development within BPM. Most studies focus on technological aspects or general digitalization, limiting understanding of AI as a systemic managerial factor. As a result, artificial intelligence is often interpreted as a tool of operational optimization rather than a driver of business model transformation and value creation.

The scientific problem lies in the lack of systemically grounded approaches to AI integration into BPM capable of ensuring the synergy of digital transformation and innovative development. Models of intelligent BPM oriented toward adaptability and self-learning, as well as methods for assessing AI impact on enterprise efficiency and competitiveness, remain insufficiently developed. The absence of tools accounting for digital maturity and industry specificity further complicates implementation.

Accordingly, the purpose of the article is to substantiate the theoretical and methodological foundations and to develop a conceptual model of AI integration into business process management as a factor of enterprise innovative development.

2 Presentation of the main material

In the modern economy, digital transformation should be interpreted not as a stage of technological renewal, but as a paradigm shift in enterprise management logic that changes value creation mechanisms, business model architecture, and decision-making principles. Its determinant is not only technological development, but also the growing complexity, uncertainty, and nonlinearity of the external environment, which undermine the effectiveness of traditional management models based on predictability and stability. In this context, digital transformation emerges as a response to the limitations of classical managerial rationality and as a transition to more adaptive forms of organizational behavior.

Unlike digitalization, which has a local and operational character, digital transformation implies the integration of technological, organizational, and managerial dimensions within

a single dynamic system. It may be interpreted as a mechanism for synchronizing digital platforms, network interaction, and data-driven management, forming a new quality of managerial integrity. This approach overcomes the reductionism inherent in interpreting digital change and allows it to be considered an interconnected process in which technologies, structure, and management evolve synchronously.

A key consequence of this transformation is the institutionalization of data as a strategic management resource, which changes the managerial process from retrospective analysis to predictive-adaptive modeling. In this logic, data serve not merely as a decision-support tool but as its ontological basis, enabling alternative development scenarios and increasing the precision of managerial interventions. As a result, flexible business models capable of self-renewal in real time emerge, while innovation becomes embedded in enterprise operations as a continuous process. Thus, digital transformation acquires the features of a meta-mechanism that not only stimulates innovation but also defines its structural conditions.

If digital transformation forms the strategic context of change, its implementation occurs through the system of business processes, which highlights the need to rethink the role of BPM as a key element of managerial architecture.

In this context, it is appropriate to refer to the process approach as a fundamental basis for organizing enterprise activities. One of the key concepts within this approach is the “business process.” A detailed interpretation is provided by scholars who define a business process as “...a purposeful, structured flow of interrelated actions (operations, tasks, procedures, steps, stages) performed sequentially or in parallel, determined by the product life cycle and aimed at transforming ‘inputs’- informational, labor, and material resource flows- into the desired ‘output,’ namely the specified final result of the business process, which satisfies the needs of an external or internal client (customer) by delivering value and possessing greater utility” [8, p. 234]. Thus, business processes constitute the fundamental basis of organizational functioning and determine the effectiveness of managerial decision-making.

The traditional BPM model was formed within the paradigm of functional rationality, dominated by standardization, control, and optimization. However, in the digital environment, this logic proves limited, as it does not fully account for the dynamics of change and the need for flexibility. This leads to a transition toward a process-adaptive paradigm, in which business processes are viewed

as open systems operating in constant interaction with data and the environment.

In this context, BPM is transformed from an instrument of operational optimization into an infrastructure for implementing digital transformation that ensures integration of strategic and operational management levels. Accordingly, the concept of a process-driven organization emerges, in which processes perform not only an operational but also a structuring function, defining the logic of organizational interaction and resource allocation.

At the same time, the retrospective and deterministic nature of traditional BPM limits its ability to support proactive management, especially under conditions of uncertainty. This creates the preconditions for integrating tools capable of ensuring an anticipatory character of management. In this context, artificial intelligence acts not as an addition to BPM, but as a factor of its qualitative transformation.

The integration of AI into BPM signifies a transition to a cognitive-adaptive management model in which processes acquire the capacity to interpret data, learn, and make decisions under uncertainty. Unlike traditional information systems that function within predefined algorithms, AI enables the detection of hidden patterns, generation of predictive models, and support of scenario analysis, thereby changing management logic from reactive to proactive.

As a result, intelligent BPM emerges, within which business processes function as self-regulating systems capable of adaptation, dynamic adjustment, and continuous improvement. This makes it possible to regard artificial intelligence as an institutional component of the management system that defines a new level of complexity and effectiveness.

At the same time, the effectiveness of such integration depends on technological and institutional factors, including digital maturity, data quality, organizational culture, and the capacity for inter-system integration. This underlines that the intelligentization of management is not merely technological, but a comprehensive organizational and economic process.

Thus, digital transformation, BPM, and artificial intelligence form an integrated management system in which the first determines the strategic vector of development, the second ensures the structural implementation of change, and the third provides intelligentization and adaptability.

The current stage of enterprise development is characterized by a transition from fragmented digitalization of individual functions to

comprehensive digital transformation, within which not only operational activity but also strategic management logic is changing. Under these conditions, digital technologies cease to perform a purely auxiliary role and acquire system-forming significance, determining business architecture, value creation mechanisms, and interaction with the market environment. Accordingly, digital transformation appears not as a set of separate projects, but as a continuous process of organizational development integrated into all management levels.

One of the defining trends is the shift from technologies as tools supporting business to technologies as the environment of its functioning. Digital solutions no longer merely serve existing processes, but influence their construction, organizational links, and the dynamics of enterprise development. In this context, the enterprise should be viewed as an open adaptive system integrated into digital ecosystems, where value creation increasingly occurs through network interaction with other market participants.

Artificial intelligence acquires particular significance in this transformation, becoming not just another automation technology, but an instrument for data interpretation, knowledge generation, and managerial decision support. The growth of information volumes generated by digital activity, combined with advances in machine learning, neural networks, and cloud infrastructure, creates a fundamentally new basis for management. Data thus become a strategic asset, and the enterprise's ability to accumulate, integrate, and interpret information flows becomes a key factor of competitiveness.

The managerial manifestation of this trend is the spread of the data-driven management model, within which decisions increasingly rely on analytical conclusions, predictive models, and algorithmic support. This implies a transition from reactive management focused on past results to proactive management based on forecasting future system states. Such a shift shortens the gap between problem identification and response, reduces uncertainty, and improves coordination of business processes.

At the same time, business models are being transformed toward digital platforms, service solutions, and ecosystem interaction. Value creation shifts from the level of an individual enterprise to network configurations, where data exchange and coordination among actors play a key role. In this logic, artificial intelligence performs not only internal optimization but also external coordination, ensuring personalization, alignment of resource flows, and faster response to demand changes.

Another important trend is the transformation of innovation activity. Whereas innovations were previously discrete and project-based, in the context of digital transformation they become embedded in everyday operations. Artificial intelligence acts as a catalyst of continuous innovation, enabling rapid testing of hypotheses, adaptation of products and services, and scaling of effective solutions.

At the same time, digitalization and AI implementation remain uneven across industries and enterprises. Their intensity depends on digital maturity, including IT infrastructure, data integration, digital competencies, and readiness for organizational change. Industry characteristics also matter, determining process formalization, repeatability, and automation potential. Therefore, digital transformation and AI integration should be viewed as adaptive processes requiring consideration of both internal configurations and external conditions.

Thus, current trends indicate the emergence of a new managerial paradigm in which data, analytics, and intelligent systems play a central role. At the same time, this transformation reveals contradictions and limitations that complicate full AI integration into BPM, necessitating a shift from describing trends to analyzing the barriers that restrain intelligentization.

Despite rapid technological development, AI integration into BPM remains a complex multidimensional process, as it requires transformation of the entire management system, including information architecture, process logic, organizational culture, and decision-making mechanisms.

One of the key problems is the structural mismatch between technological progress and the internal environment of enterprises. Information systems are often fragmented and weakly integrated, preventing AI from functioning effectively because of the lack of coordinated data flows. A fundamental obstacle is data quality, since unstructured, incomplete, or inconsistent data significantly reduce analytical effectiveness. In such cases, the limitation lies not in technology but in the immaturity of the information environment.

Organizational inertia also plays a critical role, manifesting in resistance to change and reliance on intuitive decision-making. AI integration requires rethinking managerial roles and transitioning toward analytically grounded decisions, making digital transformation a socio-organizational as well as technological process. Another limitation is the mismatch of business processes with intelligentization requirements. Processes may be insufficiently formalized or excessively rigid,

complicating automation or reducing adaptability. Therefore, AI integration often requires prior process reengineering aimed at changing their underlying logic.

The human-capital dimension is equally important. Effective use of AI depends on competencies in data analysis, machine learning, and digital management. A lack of such skills limits both implementation and practical integration, particularly in transition economies with underdeveloped institutional conditions. Ethical and security issues are also increasingly significant. Automation, large-scale data processing, and opaque algorithms raise concerns about responsibility, data protection, explainability, and regulation. The absence of clear regulatory frameworks increases risks and uncertainty for enterprises.

These barriers form an interconnected system: infrastructural weaknesses worsen data quality, poor data reduce analytical effectiveness, organizational inertia slows transformation, and skill deficits limit technology use. Thus, the key problem of AI integration lies not in a lack of technologies, but in the imbalance among management system components. Accordingly, the classification of barriers should be viewed as an analytical model reflecting their systemic influence. Visualization of their interrelations demonstrates that the lack of coordination among infrastructure, data, processes, culture, and competencies creates an accumulation effect that reduces transformation effectiveness.

Thus, AI integration into BPM is a complex multilevel process requiring systemic restructuring of enterprise management architecture. This raises the question of the conditions necessary for the formation of intelligent BPM models.

The analysis shows that AI integration should not be interpreted as an isolated technological project, but as a stage in the evolution of managerial paradigms—from classical process rationality to a cognitive-adaptive model where data, analytics, and algorithmic decision-making play a decisive role. Unlike traditional BPM focused on regulation and control, intelligent models rely on self-learning, forecasting, and adaptation. Management shifts from controlling execution to managing process behavior, while processes become dynamic systems responsive to data.

The evolution of BPM can be seen as a multilevel transition – from automation and standardization to analytical management, and finally to intelligent systems capable of self-regulation. This transition requires systemic preconditions rather than mere technological expansion. A structural-functional approach allows these preconditions to be interpreted as elements of a unified system:

infrastructure, data, analytics, AI, processes, and organizational readiness. Their interaction determines overall effectiveness.

Thus, BPM intelligentization is not the result of isolated digital solutions, but of their synergy across technological, process, and organizational levels. Its systemic model is nonlinear, incorporating feedback loops between its components. The key conclusion is that the effectiveness of AI integration depends not on the level of individual elements, but on their coherence. Therefore, the central condition for intelligentization is systemic complementarity rather than resource maximization.

Thus, intelligent BPM should be regarded as a new managerial paradigm formed at the intersection of process management, analytics, and artificial intelligence, providing the foundation for developing a conceptual model of AI integration as a driver of enterprise innovation.

The generalization of the theoretical and analytical results provides grounds to assert that the integration of artificial intelligence into business process management cannot be viewed as the implementation of a separate digital tool or local innovation. It should be interpreted as a comprehensive transformation of the enterprise management system, encompassing changes in its structural, functional, and cognitive characteristics. In this context, the issue is not the partial modernization of managerial practice, but the formation of a new managerial paradigm in which the process approach, data analytics, and intelligent technologies are combined into a unified logic of organizational development.

Such a transformation reflects the broader evolution of management models—from rational-bureaucratic systems focused on regulation and control toward adaptive-cognitive systems in which data, knowledge, and the ability to interpret them under changing conditions acquire decisive importance. In this logic, artificial intelligence acts not only as a technological tool, but as a factor changing the very nature of management, shifting it from procedural regulation to dynamic, context-dependent, and prognostically oriented decision-making.

A fundamental feature of this approach is the treatment of AI as an integrative element of the management system that connects its key components—data, processes, and decisions. If in traditional BPM models business processes appear primarily as objects of standardization, optimization, and control, then under conditions of intelligentization they are transformed into complex adaptive systems capable of self-learning, forecasting, and self-regulation. This implies a shift

in enterprise logic: from static, rigidly regulated process contours to dynamic, context-sensitive structures capable of responding to environmental changes in real time.

In such an interpretation, management acquires a proactive character, since it is based not on the fixation of existing deviations, but on their prediction and prevention. This creates the conditions for a transition from a reactive operating model to predictive and subsequently cognitive management, within which the enterprise not only adapts to change, but also forms new trajectories of its own development. Therefore, AI integration into BPM should be seen as a mechanism for enhancing not only operational efficiency, but also the strategic agency of the enterprise.

Conceptually, such integration should be understood as a multidimensional process occurring at the intersection of three interrelated planes—technological, process, and managerial. The technological plane is associated with the formation of digital infrastructure that ensures the collection, storage, integration, and processing of data. The process plane reflects the transformation of business processes toward flexibility, modularity, and adaptability. The managerial plane captures the shift in decision-making principles toward data-driven management, within which managerial action increasingly relies on analytical conclusions and algorithmic support.

At the same time, decisive significance belongs not to the autonomous development of each plane, but to the degree of their coherence. An insufficient level of development of even one component generates systemic constraints that make the full intelligentization of management impossible. For this reason, AI integration should be interpreted as a process of achieving structural and functional complementarity among the elements of the management system. In this logic, the effectiveness of integration is determined less by the scale of technological implementation than by the enterprise's ability to synchronize infrastructure, data, processes, and managerial practices.

In addition, AI integration should be conceptualized from systemic and evolutionary perspectives, which allow it to be interpreted as a continuous development process rather than a one-time transformation. What is at issue is the accumulation of changes, in which the gradual improvement of system elements ultimately leads to a new quality of management. Thus, the conceptual foundations of AI integration into BPM are based on understanding this process as complex, multidimensional, and evolutionary, presupposing

the synchronous development of technological, process, and managerial components. This logic forms the theoretical basis for constructing a holistic conceptual model of AI integration into the enterprise BPM system.

Taking into account the regularities identified in the previous sections, it is advisable to propose a conceptual model for integrating artificial intelligence into enterprise BPM that reflects not only the sequence of transformational changes, but also their internal logic, causal relationships, and systemic interdependence. The proposed model is based on the idea of BPM intelligentization as an evolutionary transition from operationally oriented to cognitive-adaptive management, within which AI acts as the key mechanism for transforming data into knowledge and knowledge into managerial actions.

Unlike approaches in which AI implementation is interpreted as a separate stage of digitalization, the proposed model considers it as the result of the accumulation of systemic preconditions formed at earlier stages of management system development. This makes it possible to overcome the logic of technological determinism, whereby intelligent solutions are implemented without proper preparation of the informational, process, and organizational environment. Accordingly, the model proceeds from the assumption that AI is not the starting point of transformation, but its derivative result and, at the same time, a catalyst for further development.

The initial level of the model is the formation of the digital foundation of enterprise functioning. At this stage, an integrated information infrastructure is created that ensures data integrity, accessibility, compatibility, and suitability for managerial use. What is fundamental here is not so much the number of implemented technological solutions as the degree of integration of information flows into a unified digital management contour. It is on this basis that the transition from fragmented informatization to systemic data-centric management becomes possible.

The next level of transformation is the transition from data accumulation to analytical interpretation. At this stage, business analytics systems play the central role, ensuring the detection of patterns, trends, and causal relationships. It is here that the enterprise's analytical capability is formed as a critical precondition for BPM intelligentization. Management moves from the informational level, dominated by the recording of facts, to the analytical level, where the interpretation of facts, comparison of alternatives, and substantiation of decisions become central.

Further development of the model is associated with the integration of artificial intelligence as an instrument ensuring a qualitatively new level of data use. At this stage, a transition takes place from analytics to intelligentization: the system acquires the ability not only to analyze information, but also to generate alternative scenarios, predict the consequences of managerial decisions, and initiate adjustments to process parameters. In such a model, AI ceases to be an auxiliary digital module and becomes an active element of the managerial contour, ensuring the dynamism, adaptability, and contextual sensitivity of process management.

A key element of the proposed model is the transformation of business processes themselves. Once AI is integrated, they lose the properties of rigidly structured, linear sequences of actions and acquire the features of flexible, nonlinear systems capable of self-adjustment. This means that processes no longer function exclusively according to predefined scenarios, but change under the influence of analytical signals from the internal and external environment. Thus, the focus of management shifts from execution control to managing process behavior, which is a fundamental sign of the transition to intelligent BPM.

The final level of the model is associated with the formation of a new managerial logic based on the principles of data-driven management and the integration of algorithmic solutions into the managerial decision-making system. In such a system, decisions are formed not as the result of exclusively human expertise or machine analysis, but as a synthesis of managerial experience, human interpretive ability, and the recommendations of intelligent systems. This also changes the role of the manager: from executor-controller, the manager gradually moves toward the function of coordinator, interpreter, and architect of managerial interactions.

A fundamentally important characteristic of the model is its nonlinearity. It presupposes the existence of numerous feedback loops, through which the results of business process functioning affect data quality, data quality affects analytical performance, and analytics affects the accuracy of intelligent decisions. As a result, a closed cycle of continuous improvement is formed, within which the system acquires the capacity for self-development. This feature makes it possible to interpret the proposed model not as a linear scheme of digital modernization, but as a conceptual construction of the evolution of management from automation to intelligentization.

Thus, the proposed conceptual model reflects the logic of the transition from digital support

of processes to intelligent management of their behavior. Its principal novelty lies in the treatment of AI integration as a complex, multilevel, and interdependent process that encompasses all key elements of the enterprise management system and ensures the transition toward an adaptive, innovation-oriented model of functioning.

The practical implementation of the proposed conceptual model requires the formation of a holistic organizational and economic mechanism capable of ensuring not only the technical implementation of relevant solutions, but also the systemic transformation of the enterprise's managerial paradigm. In this context, the mechanism of AI integration should be viewed as a multidimensional dynamic system combining institutional, technological, process, and behavioral components aimed at achieving the synergistic effect of management intelligentization.

Unlike fragmented approaches to digital transformation focused on introducing separate IT solutions, the proposed mechanism is based on the principle of systemic integrity. Its essence lies in the synchronous and mutually coordinated development of the key elements of the management system-digital infrastructure, business process architecture, data management system, and organizational competencies. This makes it possible to interpret the integration of artificial intelligence not as a self-sufficient technological project, but as a form of structural reconfiguration of the entire organizational and economic system of the enterprise.

The principle of phasing occupies a central place in the mechanism, determining the logic and sequence of transformational changes. This concerns the formation of basic preconditions without which effective AI implementation is impossible. First, the development of digital infrastructure and the integration of information flows must be ensured, creating a unified information space for the enterprise. Next, a data management system is formed, intended to guarantee data quality, structure, accessibility, and suitability for analytical processing. Only on this basis does the full integration of intelligent technologies become possible-technologies capable of functioning not merely formally, but effectively.

Violation of this logic generates structural imbalances that may be described as the effect of technological prematurity. In such a case, the enterprise introduces intelligent solutions into an environment that is not ready to ensure their functionality because of low data quality, weak digital maturity, or mismatch of process architecture. Therefore, the principle of sequence

should be regarded not only as an organizational requirement, but as a critical factor of integration effectiveness.

An important element of the mechanism is ensuring structural and functional alignment between business processes and technological solutions. AI integration presupposes not the mechanical automation of existing processes, but their reconfiguration in accordance with the requirements of the digital environment. This means increasing process modularity, transparency, manageability, and capacity for integration with analytical and intelligent systems. At the same time, technological solutions themselves must take into account the specifics of processes, their degree of formalization, complexity, and criticality for enterprise functioning. Such a bilateral principle of adaptation is necessary for preventing a gap between technological potential and actual managerial practice.

The institutional and behavioral component of the mechanism also acquires special significance, since the integration of artificial intelligence transforms not only the technological but also the social subsystem of the enterprise. What is involved is a change in roles, functions, interaction patterns, and expectations concerning decision-making. In this context, the formation of a digital culture oriented toward the use of data, the development of interdisciplinary competencies, and the acceptance of new managerial approaches at all levels of the organization are of fundamental importance. Neglect of this dimension often generates latent resistance to change that may not always manifest openly, but significantly reduces transformation effectiveness.

The principle of adaptability is no less important, since it determines the mechanism's capacity for dynamic development. Under conditions of high turbulence and rapid technological change, the integration of artificial intelligence cannot be regarded as a completed act. On the contrary, it has the character of continuous evolution, requiring constant monitoring of performance, evaluation of the effectiveness of decisions, and their correction. In this context, a closed management loop based on feedback is formed, within which the results of system functioning become the source of its further improvement.

From the standpoint of systemic and synergetic approaches, the proposed mechanism should be viewed as an open nonlinear system in which the interaction of individual elements forms new qualitative characteristics that are not reducible to the simple sum of their properties. It is precisely in this plane that the synergistic effect of

intelligentization arises, manifested in improved management quality, reduced time lags in decision-making, strengthened business process flexibility, and increased enterprise innovation capability.

At the same time, the effectiveness of the mechanism is determined not only by the level of development of its individual components, but by the degree of their integration. Imbalances between technological capabilities, process architecture, and managerial practices generate system fragmentation, loss of controllability, and a decline in the effectiveness of AI integration. For this reason, the mechanism for implementing artificial intelligence integration should be regarded as a complex multilevel managerial construction whose key function is to create the conditions for the transition from a traditional management model to an intelligentized one.

The implementation of the proposed conceptual model of AI integration into the business process management system leads to the formation of a qualitatively new level of enterprise functioning that cannot be reduced to the traditionally understood improvement of operational efficiency. What is involved is a systemic transformation of management, within which not only the set of instruments changes, but also the logic of organizing activity, the mechanisms of interaction among system elements, and the ways of creating value.

First of all, AI integration ensures the transition to a new type of efficiency, which may be defined as intelligent-adaptive efficiency. Its content lies not only in cost optimization or productivity growth, but in the system's ability to self-adjust, respond rapidly to change, and maintain functional stability under conditions of uncertainty. In this logic, business processes are no longer merely executed more efficiently—they become more sensitive to environmental signals and capable of changing their own configuration depending on analytical conclusions.

A significant result is the enhancement of the cognitive quality of managerial decisions. This concerns the transformation of the decision-making process from predominantly intuitive-expert to analytically grounded, based on the use of large data sets, machine learning algorithms, and predictive models. As a result, a new type of managerial rationality is formed in which human experience is combined with the capabilities of intelligent systems, making it possible to reduce the influence of subjective factors and increase the precision of managerial interventions.

One of the key effects is the establishment of a proactive management model, under which the enterprise acquires the ability not only to react to

changes in the external environment, but also to anticipate them, identify deviations in a timely manner, and form anticipatory solutions. In this context, management acquires a prognostic character, while business processes function as elements of an early warning system for identifying risks and preventing crisis scenarios. This significantly increases the enterprise's resilience to external shocks and strengthens its adaptive potential.

No less important is the impact of the model on the enterprise's innovation activity. The integration of artificial intelligence creates the conditions for the transition from a discrete to a continuous model of innovative development, within which the generation, testing, selection, and scaling of solutions take place on an ongoing basis. This shortens innovation cycles, increases the speed of adaptation of products and services to changes in the market environment, and strengthens the enterprise's capacity for constant renewal.

The transformational impact of the model on the enterprise's business model should also be noted separately. The use of AI contributes to the transition toward platform-based, service-oriented, and ecosystem forms of business organization, within which value creation takes place through the coordination of different market participants, the exchange of data, and digital interaction. As a result, the enterprise gains the opportunity to move beyond traditional industry boundaries and form new sources of competitive advantage.

The systemic character of AI integration effects is manifested in their interdependence and mutual reinforcement. Increased business process efficiency creates the preconditions for improving the quality of managerial decisions; higher-quality decisions stimulate innovation activity; innovation, in turn, contributes to the transformation of business models. In this way, a multiplicative effect is formed in which the overall result exceeds the sum of individual local improvements.

From a theoretical perspective, this provides grounds for regarding artificial intelligence as a system-forming factor of enterprise development that determines its ability to function under conditions of high dynamism and uncertainty. In practical terms, this means the formation of a new quality of management based on the combination of the process approach, analytics, and intelligent technologies. Thus, the proposed model of AI integration into the BPM system ensures the transition to an intelligentized, adaptive, and innovation-oriented model of enterprise functioning, and its implementation produces a comprehensive effect that encompasses all

management levels and determines the enterprise's long-term competitiveness in the digital economy.

3 Conclusions

The study substantiates that the integration of artificial intelligence into business process management should be interpreted not as the implementation of individual technological solutions, but as a systemic transformation of the enterprise management paradigm. Digital transformation acts as the strategic context of this process, while BPM provides its structural basis, and artificial intelligence ensures the intelligentization and adaptability of management.

It is established that the evolution of BPM under the influence of digital technologies and artificial intelligence leads to the formation of intelligent business process management, within which processes acquire the properties of self-learning, forecasting, and dynamic adjustment. This reflects a transition from reactive to proactive and subsequently cognitive-adaptive management, where decisions are based on data, analytics, and algorithmic support.

The analysis of current trends has demonstrated that the key directions of digital transformation include the development of data-driven management, the spread of ecosystem business models, and the transition to continuous innovation. At the same time, the study has revealed a system of interrelated barriers to AI integration, including infrastructural limitations, low data quality, organizational inertia, process rigidity, competence deficits, and regulatory uncertainty. It is proven that their impact is cumulative, and therefore the effectiveness of AI implementation depends primarily on the coherence of management system elements rather than on the level of technological development alone.

The proposed conceptual model of artificial intelligence integration reflects the evolutionary transition from automation to intelligent management and is based on the principles of systemic integrity, phased development, and adaptability. It substantiates that AI should be considered not as the starting point of transformation, but as the result of the accumulation of systemic preconditions and, at the same time, a catalyst for further development.

The practical significance of the study lies in the development of an organizational and economic mechanism for AI integration, which ensures the synchronization of digital infrastructure, data management, business processes, and organizational competencies. The implementation of this mechanism makes it possible to avoid structural imbalances and achieve a synergistic effect of management intelligentization.

It is substantiated that implementation of the conceptual model leads to the formation of intelligent-adaptive efficiency, improves the cognitive quality of managerial decisions, enables proactive management, and enhances the innovative capacity of enterprises. This ensures not only the optimization of operational activities, but also the transformation of business models and the strengthening of long-term competitiveness.

Thus, artificial intelligence should be regarded as a system-forming factor of enterprise development in the digital economy, determining its ability to function under conditions of uncertainty, complexity, and rapid change. The results obtained form a theoretical and methodological basis for further research on intelligent BPM models and the development of practical tools for their implementation in enterprises of different industries and levels of digital maturity.

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