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DIGITAL TRANSFORMATION OF ENTERPRISE BUSINESS PROCESSES IN THE CONDITIONS OF MODERN INDUSTRIAL REVOLUTIONS

Industry 4.0 involves the digitalization of all spheres of human life, as well as the integration of services and physical objects into a unified industrial network. The concept of Industry 5.0 builds upon Industry 4.0, expanding its capabilities through the use of artificial intelligence (AI) and Big Data for deeper analytics and ethical decision-making; collaborative robots working alongside humans; virtual models of real objects for risk-free testing of changes (Digital Twins); and the personalization of products tailored to specific customers.

Due to the rapid development of innovation, technology, and science, the conditions for doing business, enterprise activities, and personnel management are changing. Active digitalization, integration, and unification of machine and human labor into a single network, along with the corresponding digital transformation of business processes, make it possible to obtain information about the entire product life cycle. This, in turn, reduces defects, errors, and production waste. An important prospect for further business digitalization in Ukraine is the growth of employee productivity and increased customer satisfaction, as well as enhancing the reputation of enterprises as modern and progressive organizations. Therefore, studying digital transformation and its role in optimizing business processes is highly relevant today and requires deeper research.

The digital transformation of enterprise business processes is currently viewed as a multifaceted and systemic phenomenon that encompasses a much broader range of changes than simply implementing new technologies. It involves transforming the entire logic of enterprise management—from strategic planning and business process organization to building flexible communication systems with customers, suppliers, and partners. This process also changes the structure of business models, the nature of labor relations, and the principles of value creation and distribution [1].

Digitalization refers to the process of converting analog data, processes, or services into digital formats. Essentially, it involves replacing traditional analog methods of storing, processing, and transmitting information with digital technologies. For example, this may include scanning documents, converting physical archives into electronic form, and automating routine processes using modern digital solutions. Digitalization typically applies to individual business elements or functions [2].

At the same time, it is important to distinguish between digitalization and digital transformation. While digitalization mainly involves converting information and certain processes into digital form, digital transformation entails deeper structural changes in enterprise operations. It requires a comprehensive rethinking of business processes, resource management, customer interaction, and the development of new business models based on modern digital technologies. In the context of Industry 4.0 and 5.0, digital transformation becomes a key factor in enhancing enterprise competitiveness. Technologies such as cloud services, artificial intelligence, the Internet of Things (IoT), and automated management systems enable optimization of business processes, cost reduction, faster decision-making, and improved interaction among all stakeholders. Moreover, digital transformation enhances enterprise flexibility and adaptability to environmental changes. By leveraging digital technologies, companies can quickly analyze large volumes of data, forecast market trends, and respond more effectively to customer needs, thereby creating new value and innovative business models.

One of the most significant effects of digital transformation is the automation of business processes, which allows enterprises to improve operational efficiency and quickly adapt to market changes. The implementation of modern digital platforms, including ERP and CRM systems, robotic process automation (RPA), and data analytics, helps reduce the time required for routine tasks, lower costs, and minimize errors related to human factors [3]. For example, studies of Ukrainian enterprises show that integrating CRM systems not only optimizes customer interaction but also enables analysis of customer needs and behavior, allowing for personalized offers and increased customer satisfaction.

One of the most important areas where digital technologies are applied is logistics and supply chain management. Technologies such as RFID tags and sensors allow tracking the movement of goods and monitoring their quality. This helps enterprises reduce logistics costs and improve service quality. Digital technologies also enhance marketing campaigns and help attract a larger audience. Tools such as contextual advertising and retargeting enable businesses to target specific audiences and acquire new customers. Additionally, the use of social media and internet marketing allows companies to interact with customers and improve their satisfaction. However, digital technologies not only simplify and accelerate processes but also create new business opportunities. For instance, blockchain technologies are used to develop new financial instruments such as cryptocurrencies, which are already applied in various fields, including finance, logistics, and law [4].

An important stage of digital transformation is the deep integration of artificial intelligence (AI), which acts as the fundamental “intelligence” of the new cyber-physical reality and smart industry. Unlike traditional automation, AI enables systems to independently interpret continuous streams of external data, learn from experience, and flexibly adapt to changing goals. In practice, this allows companies to implement the concept of “Quality 4.0,” identify problems at the design stage, and ensure predictive maintenance, significantly optimizing operational costs. Conceptually, AI is evolving beyond a simple IT tool and gradually becoming an autonomous participant in business processes—an “electronic entity” capable of making independent business and production decisions. This suggests a fundamental shift in corporate governance paradigms: traditional hierarchies are transforming into partnership ecosystems where algorithmized physical and cognitive labor is delegated to AI agents, and human capital focuses primarily on creative, cognitive, and social-communicative functions [5].

In conclusion, the digital transformation of business processes is a key response of enterprises to the challenges of modern industrial revolutions. It involves not only digitalizing individual processes but also comprehensively rethinking company operations, resource management, customer interaction, and business model development. Through modern technologies, enterprises can automate routine processes, optimize costs, and improve decision-making efficiency. Digital tools also enhance business model flexibility, enabling companies to quickly adapt to market changes and customer needs. Thus, digital transformation becomes not only a tool for increasing productivity but also a strategic factor in enterprise development. In today’s competitive and rapidly changing environment, successful companies will be those that can combine process digitalization, flexible business models, and effective customer interaction to ensure sustainability, innovation, and competitiveness.

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