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MANAGING INNOVATIVE ACTIVITIES OF ENTERPRISES IN THE DIGITAL ECONOMY

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Abstract

This article examines modern approaches to managing organizational innovation in the digital economy, characterized by rapid technological change, digital transformation of business processes, and the growing role of data as a strategic resource. It analyzes key factors that determine the effectiveness of organizational innovation, including the implementation of digital technologies, artificial intelligence, big data, cloud platforms, and management automation tools. Particular attention is paid to changing the innovation management system, developing digital competencies of employees, forming an innovation culture, and improving the mechanism for making management decisions based on data analysis. An analysis of modern innovation management models is conducted, and the main obstacles to the digital transformation of organizations are identified. The need to integrate digital technologies into the strategic innovation management system is proven as a prerequisite for increasing the competitiveness, sustainability, and adaptability of enterprises. It is concluded that the use of an integrated approach to innovation management based on digital tools and flexible organizational mechanisms helps to accelerate the innovation process, increase the efficiency of resource use, and ensure the long-term economic development of enterprises.

Scientific Novelty. The scientific novelty of this study lies in the development of theoretical and methodological principles for managing enterprise innovation in the digital economy through the integration of digital technologies into strategic and operational management systems. This paper proposes a comprehensive approach to managing innovation that takes into account the impact of digital transformation on the development, implementation, and commercialization of innovations. The relationship between an enterprise's digital maturity and innovation effectiveness is substantiated, and key

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management factors that enhance innovation, adaptability, and competitiveness of organizations in a dynamically changing digital environment are identified. The obtained results expand scientific understanding of innovation management mechanisms and can serve as a basis for improving corporate strategies for the innovative development of enterprises.

Purpose of the Study. The purpose of the study is to develop theoretical and practical recommendations for improving the management of enterprise innovation in the digital economy based on an analysis of modern digital technologies, innovation management models, and digital transformation mechanisms that enhance the efficiency of innovation processes, competitiveness, and sustainable development of enterprises.

Keywords: Digital economy, innovation activity, innovation management, digital transformation, innovation management, digital technologies, artificial intelligence, big data, enterprise competitiveness, strategic management.

Introduction

For several centuries, innovation has been a key factor in economic growth, technological progress, and increased enterprise competitiveness. Historically, the development of innovation management has been closely linked to the evolution of industrial production and scientific and technological progress. As early as the First Industrial Revolution, the introduction of mechanized production necessitated the systematic management of technological change. The Second Industrial Revolution, characterized by mass production, electrification, and the development of mechanical engineering, increased the importance of scientific research as a source of competitive advantage for enterprises.

The foundation of modern innovation theory was laid in the first half of the 20th century by the works of Joseph Schumpeter. The Austrian economist substantiated the role of innovation as a key driver of economic progress. According to his concept, innovation encompasses the implementation of advanced production methods, the development of new markets, and the search for alternative resources. Schumpeter also formulated the principle of "creative

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destruction," according to which economic development occurs through the continuous displacement of inefficient technologies and business models by more advanced alternatives.

In the second half of the 20th century, the development of innovation management was accompanied by the emergence of a systems approach to managing enterprise research and development. Significant contributions were made by Peter Drucker, who viewed innovation as the result of targeted management activity, and Michael Porter, who demonstrated the relationship between enterprise innovation and the formation of sustainable competitive advantages. During this period, innovation management began to be viewed as a continuous process, integrating scientific research, product development, technology commercialization, and strategic management.

At the turn of the 20th and 21st centuries, the global economic system underwent fundamental changes, transitioning to a digital economy. The development of technologies such as artificial intelligence, cloud computing, the Internet of Things, and blockchain has radically transformed the business environment. In today's reality, data and digital platforms have become key factors of competitiveness, and companies' success now directly depends on the pace of their innovation.

The modern digital economy has fundamentally changed the nature of innovation. While innovation was previously focused primarily on improving production processes and creating new products, today's innovation targets include business models, digital services, platform solutions, intelligent management systems, customer experience, and ecosystems of interaction between market participants. Consequently, traditional methods of innovation management are increasingly proving ineffective, as they fail to provide the necessary flexibility, speed of decision-making, and the ability of enterprises to adapt to dynamic changes in the external environment.

Despite a significant amount of research devoted to innovation management and digital transformation, issues of integrated management of enterprise innovation in the digital economy continue to be the subject of academic debate. Approaches to integrating digital technologies into strategic innovation management systems, assessing the impact of enterprise digital maturity on

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innovation, and developing effective mechanisms for managing innovation processes in the context of constant technological change remain insufficiently developed.

Therefore, research into the management of enterprise innovation in the digital economy is of significant scientific and practical interest. Developing modern approaches to organizing innovation processes using digital technologies can improve management efficiency, accelerate the commercialization of innovations, ensure sustainable growth in enterprise competitiveness, and create the conditions for their long-term development in the emerging digital economy.

Theoretical foundations for managing enterprise innovation. In today's environment, innovation is a key factor in ensuring sustainable economic growth, increasing competitiveness, and adapting to a dynamically changing external environment.

Today, the growing influence of the digital economy is changing global relations across all economic sectors. To ensure a stable competitive environment for industrial enterprises, it is necessary to update enterprise development strategies aimed not only at meeting current demand but also at integrating advanced technologies into the production process and, consequently, implementing an innovative approach [1].

The globalization of markets, the acceleration of scientific and technological progress, the digitalization of the economy, and increased competition necessitate a constant search for new management solutions, technological improvements, and the development of innovative products. Under these conditions, innovation is no longer viewed solely as scientific research and is becoming a comprehensive system for managing enterprise development.

The concept of innovation has undergone a long process of theoretical development, a key stage of which was the work of the Austrian economist Joseph Schumpeter. He substantiated the role of innovation as a fundamental driver of economic growth. His theory defines innovation as the implementation of new production combinations, encompassing the production of innovative products, the adoption of advanced technologies, entry into new markets, the search for alternative resources, and the optimization of management processes.

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Schumpeter introduced the concept of "creative destruction," according to which entrepreneurial initiative facilitates the displacement of inefficient technologies by more advanced ones, which ultimately strengthens the competitiveness of the entire economic system.

Innovation theory was further developed by Peter Drucker, who viewed innovation as the result of systematic management activity. He noted that innovation is an organized process for identifying new opportunities for enterprise development, based on the analysis of changes in the organization's external and internal environment. Unlike the traditional understanding of innovation solely as technological developments, the modern approach embraces organizational, marketing, managerial, financial, and digital innovations.

According to the international Oslo Manual, developed by the Organization for Economic Cooperation and Development, innovation is defined as a new or significantly improved product, process, marketing method, or organizational approach implemented in an enterprise's operations. This definition reflects the comprehensive nature of innovation and emphasizes the need for its integration into all areas of an organization's functioning.

Within the current management paradigm, the innovation cycle is interpreted as a continuous, logically structured process. It begins with the formation of a concept based on a synthesis of market demand, technological potential, and corporate strategy. Subsequent stages include R&D to establish a technological foundation, design, and testing of a prototype, along with a cost-benefit analysis. The final phase encompasses the integration of the innovation into the production cycle, its market launch, and performance monitoring.

Today, the systematization of innovations relies on a multi-criteria approach. Depending on the application area, the following are distinguished:

1) Product - creation or high-quality updating of goods/services.
2) Process - optimization of production technologies and operational methods.
3) Organizational - transformations in the management system, company structure and business processes.
4) Marketing - implementation of innovative approaches to sales, pricing and communication with customers.

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Based on their degree of novelty, innovations are classified as radical, incremental, and imitative. Radical innovations lead to the formation of new markets and technological paradigms, significantly altering existing economic relations. Incremental innovations are aimed at improving existing products and processes. Imitative innovations involve adapting existing solutions to the specific needs of a particular enterprise or industry.

Digital innovation, which represents the integration of digital technologies into production, management, and commercial processes, is becoming particularly important in the modern economy. This includes the use of artificial intelligence, big data technologies, cloud computing, the Industrial Internet of Things, digital platforms, robotic process automation, and distributed ledger technologies. Their use significantly reduces the innovation cycle, improves the accuracy of management decisions, and reduces the costs of new product development.

The effectiveness of innovation management is determined by a combination of internal and external factors. Internal factors include the level of scientific and technical potential of an enterprise, personnel qualifications, the amount of financial resources, the quality of corporate governance, organizational culture, and the organization's digital maturity. External factors include government innovation policy, the level of digital infrastructure development, the competitive environment, the investment climate, the availability of modern technologies, and the dynamics of consumer demand.

In the digital economy, innovation is becoming a continuous process. Companies are forced to continually improve existing products, implement new technologies, and adapt business models to changes in the digital environment. This requires a shift from traditional innovation management methods to flexible innovation management models based on digital platforms, data analytics, artificial intelligence, and modern decision support information systems.

The evolution of innovation management concepts. The development of innovation management is the result of a long-term evolution in economic thought, reflecting the changing role of innovation in ensuring the sustainable development of enterprises and national economies [2]. As production processes become more complex, scientific and technological potential grows, and global

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competition intensifies, approaches to understanding innovation, its organization, and management mechanisms have evolved. While innovation was initially viewed primarily as the result of scientific discoveries and technical inventions, today it represents a complex system of interactions between technologies, human capital, digital platforms, and management decisions.

The development of the scientific foundations of innovation management is linked to the work of Joseph Schumpeter, who first identified innovation as the primary source of economic development. In his work "The Theory of Economic Development," the scholar demonstrated that economic growth is achieved not by capital accumulation, but by the introduction of new combinations of production factors. According to his concept, the entrepreneur is the primary agent of innovation, capable of transforming scientific knowledge into commercially successful products and technologies. Schumpeter also formulated the concept of creative destruction, according to which each new technology gradually displaces less effective solutions, creating new economic sectors and changing market structure [3].

In the second half of the 20th century, the development of innovation management was linked to the rapid growth of research and development departments in large industrial companies. During this period, a linear model of the innovation process emerged, according to which innovations were created through a sequential process of fundamental research, applied development, pilot production, and product commercialization. Scientific activity was considered the primary source of innovation, and innovation management was based on centralized research and development planning.

The subsequent evolution of the global economy revealed the inadequacy of the linear innovation model. Experience has shown that the success of innovation depends not only on research and development, but also on the continuous exchange of information between a company, its customers, partners, and investors. This has led to the introduction of an interactive model based on feedback loops at all stages of the innovation cycle. This approach has enabled companies to respond more quickly to market transformations.

Peter Drucker made a significant contribution to the development of innovation management, viewing innovation as a systematic management process. He

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Website: usajournals.org

believed that innovation should be based not on random discoveries, but on a constant search for new opportunities for enterprise development. He identified changes in market structure, demographic processes, new knowledge, technological advances, changing consumer preferences, and internal organizational transformations as sources of innovation. This approach was the first to link innovation management with strategic organizational management.

Michael Porter's research had a significant influence on the development of modern innovation management theory. Within the framework of his theory of competitive advantage, he demonstrated that a company's sustainable market position is determined not by the amount of available resources, but by its ability to continually create and implement innovations. Companies with high innovative potential adapt more quickly to environmental changes, utilize technology more effectively, and build long-term competitive advantages.

At the end of the 20th century, the concept of continuous improvement, developed by the Japanese school of management, gained widespread acceptance. This approach was based on the Kaizen philosophy, which advocates the constant improvement of production and management processes through small, consistent changes. Unlike radical innovations, which require significant financial investment, the concept of continuous improvement focuses on maximizing a company's internal resources, engaging staff in the process of operational improvement, and fostering an innovative organizational culture.

A new stage in the development of innovation management was the emergence of the concept of open innovation, proposed by Henry Chesbrough at the beginning of the 21st century. According to this concept, companies should not limit themselves to using only their own scientific developments. The most effective innovation activities involve active collaboration with universities, research centers, startups, venture capital funds, and other participants in the innovation ecosystem. This approach significantly accelerates the development of new technologies, reduces research costs, and expands the possibilities for commercializing innovative projects.

Along with the development of open innovation, the concept of innovation ecosystems emerged. "Unlike traditional models based on the activities of individual enterprises, an innovation ecosystem views the innovation process as

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Volume 01, Issue 08, November, 2025
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the result of the interaction of multiple participants, including government agencies, educational institutions, research organizations, technology companies, financial institutions, and consumers. It is the interaction between these actors that becomes the most important factor in shaping the innovative potential of a region or country" [4].

The current stage of innovation management development is linked to the emergence of the digital economy. The use of artificial intelligence, big data, cloud computing, digital platforms, the Industrial Internet of Things, machine learning technologies, and intelligent analytics has fundamentally changed innovation management processes. While management decisions were previously based primarily on expert assessments, today's companies have the opportunity to utilize big data processing, predictive analytics, and intelligent decision support systems.

Digital transformation has significantly changed the organization of innovation processes. A significant portion of research and development is conducted using digital collaboration platforms, virtual modeling, digital twins, and automated design systems. This significantly reduces the time it takes to develop new products, reduces the number of errors during the design stage, and improves resource efficiency.

Modern companies are increasingly adopting agile methods for managing innovation projects. The most widely used are Agile, Scrum, Lean Startup, and Design Thinking [5]. Their use accelerates the development of innovative products, reduces time to market, increases project management flexibility, and fosters closer engagement with end customers.

A distinctive feature of modern innovation management is the integration of digital technologies into strategic enterprise management. Innovation is no longer a standalone activity but an integral part of corporate strategy, ensuring the organization's digital transformation, developing intellectual capital, and enhancing business resilience in an environment of high technological uncertainty.

Modern American Journal of Business, Economics, and Entrepreneurship
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Website: usajournals.org

Modern approaches to innovation management in economics. The global economy is currently experiencing accelerated scientific and technological progress, the active digitalization of business processes, shorter product life cycles, and increased global competition. In this context, innovation management is becoming strategically important, as a company's ability to quickly create, implement, and commercialize innovations determines its sustainability and long-term competitiveness. Unlike traditional management models, modern approaches are focused on developing a flexible innovation system capable of quickly responding to changes in the external environment and effectively leveraging digital technologies.

Research shows that one of the most widespread modern approaches is a strategic approach to innovation management. Its essence lies in the integration of innovation activities into the overall strategic management system of an enterprise [6]. Innovations are viewed not as isolated projects, but as a long-term direction for the organization's development, ensuring the achievement of strategic goals. Within this approach, enterprise management formulates an innovation strategy, determines priority areas for technological development, allocates resources, and evaluates the effectiveness of innovation projects.

The strategic approach involves continuous monitoring of the external environment, analyzing technological trends, and forecasting market changes. Particular attention is paid to managing the innovation portfolio, which allows for the simultaneous implementation of short-term and long-term projects with varying levels of risk and expected returns. This approach ensures sustainable development of the enterprise and facilitates the efficient allocation of investment resources.

In recent years, the concept of open innovation has gained widespread popularity. Unlike the traditional model, which relies solely on internal research and development, open innovation involves active collaboration between a company and external participants in the innovation process. These include universities, research organizations, startups, technology companies, investors, government development institutions, and end consumers.

The open innovation model significantly reduces research costs, accelerates the implementation of new technologies, and improves the commercialization of

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intellectual property. Furthermore, collaboration with external partners facilitates knowledge sharing, the development of new competencies, and the expansion of the company's technological capabilities.

One of the most dynamically developing areas of modern economic science is the ecosystem approach to innovation management. This concept views an enterprise as an element of a unified innovation ecosystem, including research organizations, educational institutions, financial institutions, government agencies, technology companies, and consumers. The effectiveness of innovation is determined not only by the organization's internal resources but also by the quality of its interactions with other participants in the innovation environment.

Innovative ecosystems facilitate faster knowledge sharing, promote collaborative research, create new technological solutions, and enhance the investment appeal of innovative projects. This is why the world's largest technology companies are building their own digital ecosystems, bringing together developers, hardware manufacturers, software providers, and end users.

In the digital economy, a digital approach to innovation management is particularly relevant. It is based on the use of modern information technologies to organize innovation processes, analyze data, and make management decisions. Digital platforms enable the automation of innovation project management, ensure continuous information exchange between company departments, and significantly reduce the time it takes to develop new products.

The use of artificial intelligence and machine learning technologies makes it possible to forecast market demand, identify promising research areas, optimize resource allocation, and assess the likelihood of successful commercialization of innovative projects. Big data is becoming the foundation for analytical support of management decisions, ensuring high forecasting accuracy and reducing uncertainty.

The process approach plays a significant role in modern innovation management systems. It considers innovation activity as a set of interconnected business processes, each with specific inputs, management mechanisms, and expected results. This approach ensures the standardization of innovation activities,

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Volume 01, Issue 08, November, 2025
Website: usajournals.org

increased transparency of management procedures, and the ability to continuously improve individual stages of the innovation process.

The development of digital technologies has facilitated the widespread adoption of agile methods for managing innovation projects. The most well-known are Agile, Scrum, Kanban, and Lean Startup. Their use allows for small iterations, promptly responding to changing market demands, and quickly adapting innovative products to customer needs. The use of agile methods significantly reduces innovation development timelines and reduces the risks of implementing innovation projects.

Another modern trend is the concept of enterprise digital maturity. It involves assessing an organization's readiness to implement digital technologies, automate business processes, and implement innovative projects. A high level of digital maturity is characterized by a developed digital infrastructure, the availability of qualified specialists, an effective data management system, and the integration of digital technologies into the enterprise's development strategy. Recent research shows that digital maturity has a direct impact on the innovative activity of enterprises. Organizations with a high level of digitalization adapt more quickly to market changes, utilize modern technologies more effectively, and demonstrate higher productivity, investment attractiveness, and competitiveness.

Modern approaches to innovation management are also focused on ensuring sustainable enterprise development. The concept of sustainable innovation, which calls for the development of technologies and products taking into account economic, environmental, and social factors, is becoming increasingly widespread. This approach is consistent with global principles of sustainable development and contributes to the development of long-term competitive advantages for enterprises.

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Website: usajournals.org

Table 1. Comparative characteristics of modern approaches to managing innovative activities of enterprises

Approach	Main characteristics	Advantages	Restrictions
Strategic	Integrating innovation into corporate strategy	Long-term development of the enterprise	Requires significant resources
Open innovation	Using external knowledge sources	Accelerating innovation development	Dependence on partners
Ecosystem	Interaction with participants in the innovation environment	Expanding innovative potential	Difficulty of coordination
Digital	Use of digital technologies and data analytics	Automation of management, increasing the speed of decision-making	High demands on digital infrastructure
Flexible management (Agile, Scrum)	Iterative development of innovative projects	Rapid adaptation to market changes	Difficulty of application in large projects
Knowledge management	Using the intellectual capital of an organization	Increasing innovative activity	The need to develop a culture of knowledge sharing

The Impact of the Digital Economy on Enterprise Innovation Management

The current stage of global economic development is characterized by a transition to a digital economy, which is becoming the foundation for the formation of new models of management, production, and consumption. Unlike the traditional economy, where labor, capital, and material assets were the primary production resources, the digital economy is based on the use of data, digital technologies, and intellectual capital. Digitalization accelerates innovation processes, improves enterprise management efficiency, and creates new competitive advantages.

Modern American Journal of Business, Economics, and Entrepreneurship
ISSN (E): 3067-7203
Volume 01, Issue 08, November, 2025
Website: usajournals.org

The concept of the digital economy first gained widespread currency in the mid-1990s following the publication of Don Tapscott's "The Digital Economy: Promise and Peril in the Age of Networked Intelligence." Tapscott viewed the digital economy as a new form of economic organization based on the use of information and communication technologies, global data networks, and digital platforms. Subsequently, the development of this concept was accompanied by the active implementation of the internet, mobile technologies, cloud computing, artificial intelligence, the internet of things, and big data analytics [7].

Another characteristic of the digital economy is the widespread adoption of platform business models. While traditional enterprises focused primarily on manufacturing, modern digital companies are creating ecosystems that unite a large number of market participants. These platforms facilitate the rapid exchange of information, the integration of business processes, the automation of interactions between participants, and the creation of new sources of added value. As a result, innovation becomes a continuous process of collaborative creation of new products and services.

The development of the digital economy is accompanied by active digital transformation of enterprises. Digital transformation refers to a comprehensive change in business models, organizational structure, production processes, and management methods based on the implementation of modern digital technologies. Moreover, digital transformation extends far beyond the simple automation of individual operations, as it affects the entire organization's management system and requires changes in corporate culture, decision-making systems, and personnel competencies.

The main areas of digital transformation for enterprises include automation of production processes, implementation of intelligent information systems, use of artificial intelligence technologies, development of digital channels for interaction with clients, application of cloud services, robotization of business processes, and use of analytical platforms to support management decisions.

At the same time, the concept of Industry 4.0 is developing, combining digital technologies, automated production, the Industrial Internet of Things, robotic systems, digital twins, and cyber-physical systems. This concept enables companies to create fully integrated production systems capable of

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Website: usajournals.org

independently adapting to changing external conditions and ensuring continuous improvement of production processes.

In the digital economy, human capital requirements are changing significantly. Employees' digital competencies, ability to work with analytical systems, innovative project management skills, and a willingness to engage in continuous professional learning are becoming increasingly important. Therefore, human capital development is becoming a critical factor in the successful digital transformation of enterprises.

Despite the significant advantages of the digital economy, the digital transformation process is accompanied by a number of serious challenges. These include high initial investment, a shortage of qualified specialists, information security risks, insufficient digital infrastructure, resistance to organizational change, and the lack of unified methodological approaches to assessing the effectiveness of digitalization.

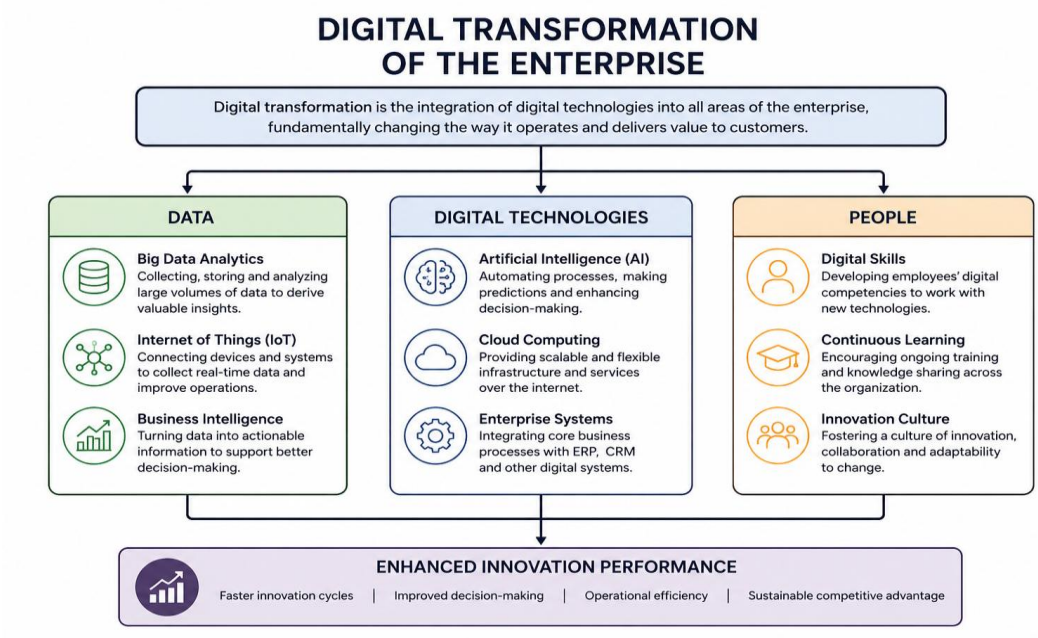

Figure 1. Digital Transformation Framework for Enterprise Innovation Management.

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Volume 01, Issue 08, November, 2025
Website: usajournals.org

Digital technologies as a driver of innovative enterprise development. The development of the digital economy is accompanied by the rapid spread of technologies that significantly alter the functioning of enterprises and become a key factor in increasing their innovative potential. "In today's environment, digital technologies serve not only as a tool for automating individual business processes but also as a strategic resource, determining the ability of organizations to create new products, improve production processes, and develop sustainable competitive advantages" [8]. Therefore, digital technologies are considered the primary driver of innovative enterprise development.

In economic literature, digital technologies are defined as a set of software, hardware, and communications solutions that enable the processing, storage, transmission, and use of data to improve the efficiency of management and production activities. Their implementation allows companies to significantly accelerate innovation processes, improve the accuracy of management decisions, optimize resource utilization, and reduce the time it takes to bring new products to market.

One of the most significant technologies in the digital economy is artificial intelligence. Machine learning algorithms and intelligent data analysis enable the automation of decision-making processes, the prediction of market changes, the identification of promising areas for innovative development, and the assessment of the potential effectiveness of investment projects. Modern intelligent systems are capable of analyzing large amounts of information much faster than humans, significantly improving the quality of strategic innovation management.

The use of big data analytics facilitates the transition to information-driven management, significantly reducing uncertainty in the implementation of innovation projects. This enables companies to more effectively allocate investment resources, minimize risks, and increase the likelihood of successful commercialization of innovations.

One of the most important areas of digital transformation is the implementation of cloud technologies. Cloud platforms provide remote access to computing resources, software, and corporate information systems. This significantly reduces the cost of creating an in-house digital infrastructure, ensures the

Modern American Journal of Business, Economics, and Entrepreneurship
ISSN (E): 3067-7203
Volume 01, Issue 08, November, 2025
Website: usajournals.org

scalability of information resources, and facilitates collaboration among employees regardless of their geographical location.

Modern enterprises actively utilize digital twin technologies, which are virtual models of production facilities, technological processes, or products. Digital twins allow for the simulation of various enterprise operating scenarios, assessing the impact of management decisions, and testing innovative developments without the need for costly field experiments. This technology significantly reduces the time required to develop new products and lowers the costs of experimental design work [9].

The use of digital platforms is becoming a key element of digital transformation. They facilitate the integration of various enterprise departments, automate the exchange of information between innovation process participants, and create a unified digital project management space. The use of platform solutions helps reduce the time required for management decision-making, increase the transparency of innovation activities, and improve interaction between all participants in the innovation ecosystem.

At the same time, digital technologies are becoming the foundation for the development of intelligent manufacturing, known as Industry 4.0. Manufacturing companies are actively implementing automated production lines, robotic systems, computer vision systems, and intelligent product quality control. The integrated use of these technologies enables the creation of flexible production systems capable of quickly adapting to changing market demands and producing innovative, high-quality products.

It's worth noting that the effectiveness of digital technologies is determined not only by a company's level of technical equipment but also by its digital maturity. A high level of digital maturity requires a modern information infrastructure, an effective data management system, qualified personnel, a developed innovation culture, and the organization's readiness for continuous change. It is the combination of technological and organizational factors that ensures the maximum benefit from digital transformation.

Global experience shows that companies that actively utilize digital technologies demonstrate higher levels of innovation, labor productivity, and financial efficiency. They develop new products faster, utilize resources more efficiently,

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reduce production costs, and adapt more successfully to environmental changes. As a result, digital technologies are becoming an integral element of modern innovation management systems and a critical factor in ensuring sustainable enterprise development.

Key challenges and barriers to digital transformation of innovation. Despite the significant benefits of digitalization, the process of digital transformation of enterprise innovation is accompanied by a number of organizational, economic, technological, and social challenges. Experience shows that the implementation of modern digital technologies alone does not guarantee increased innovation efficiency. The success of digital transformation is determined by a combination of internal and external factors, including the level of digital maturity of the enterprise, the quality of strategic management, human resources, investment opportunities, and the organization's readiness for change.

One of the most significant barriers is the high level of capital expenditure on digital technology implementation. Implementing digital transformation projects requires significant investments in upgrading production infrastructure, acquiring software, creating corporate information systems, developing data centers, and ensuring cybersecurity. This problem is particularly acute for small and medium-sized enterprises, whose financial resources are significantly limited. As a result, many organizations delay the implementation of innovative digital solutions, which reduces their competitiveness and slows innovation development.

Employee resistance to organizational change poses a serious constraint. The introduction of digital technologies is accompanied by changes to traditional work practices, a redistribution of functional responsibilities, and the need for continuous employee training. Insufficient awareness among employees about the goals of digital transformation can lead to psychological barriers related to fear of job loss, a loss of professional significance, or the need to master new competencies. Such resistance can significantly slow down the implementation of innovative projects and reduce the effectiveness of digital solutions.

Another pressing issue is the insufficient integration of digital technologies into existing enterprise management systems. In many organizations, information

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systems are being implemented piecemeal, without a unified digital architecture. As a result, individual software solutions operate in isolation, hindering information sharing between departments, reducing the efficiency of management decision-making, and limiting the ability to analyze data comprehensively. This lack of integration leads to duplication of functions, increased costs, and decreased innovation effectiveness.

The insufficient level of digital maturity among enterprises remains a significant obstacle to digital transformation. Many organizations are in the early stages of digitalization and primarily use standalone information systems that do not provide comprehensive management automation. Insufficient digital infrastructure, the lack of a unified digital development strategy, and the limited use of analytical tools significantly reduce the effectiveness of innovation.

Another important issue is the underdeveloped legal framework for the digital economy. Legislation in many countries continues to adapt to new digital realities related to the use of artificial intelligence, big data processing, personal information protection, and the regulation of digital platforms. Legal uncertainty can slow the adoption of innovative technologies and create additional risks for businesses.

The problem of assessing the effectiveness of digital transformation deserves special attention. Traditional enterprise performance indicators do not always allow for an objective assessment of the results of digital technology implementation. The economic impact of digitalization often manifests itself not immediately, but rather in the long term, manifesting itself in increased organizational flexibility, accelerated innovation processes, improved decision-making quality, and improved customer engagement. This increases the need to develop new methodological approaches to assessing the digital maturity of enterprises and the effectiveness of innovation management.

Despite existing challenges, global experience demonstrates that the benefits of digital transformation significantly outweigh the associated risks. Companies that have successfully implemented digitalization programs demonstrate higher productivity, accelerated innovation, improved product quality, reduced operating costs, and increased investment attractiveness. This confirms that

Modern American Journal of Business, Economics, and Entrepreneurship
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Volume 01, Issue 08, November, 2025
Website: usajournals.org

overcoming existing barriers is a key prerequisite for sustainable, innovative enterprise development.

Improving the innovation management system for enterprises. Modern economic conditions require the development of an effective innovation management system capable of ensuring the sustainable development of enterprises in the digital economy. The rapid development of digital technologies, shortening product life cycles, and intensifying competition require the continuous improvement of management mechanisms aimed at enhancing the innovative activity of organizations.

One of the key areas of improvement is the development of a digital strategy for innovative development. Such a strategy should identify priority areas for innovation implementation, take into account the company's level of digital maturity, ensure alignment between innovation and corporate strategy, and include a system for evaluating achieved results. A clear strategy enables the rational allocation of resources, minimizes risks, and improves the effectiveness of innovation projects.

The implementation of modern digital management platforms is crucial. The use of ERP, CRM, PLM, business intelligence systems, artificial intelligence technologies, and big data analytics enables the automation of management processes, accelerates the exchange of information between departments, and improves the quality of decision-making. Digital platforms enable management to continuously monitor the implementation of innovative projects and promptly adjust strategic plans.

The next area of improvement is human capital development. The effectiveness of innovation is largely determined by the level of professional training of employees, their readiness for digital transformation, and their ability to work in an environment of constant technological change. Therefore, companies must invest in staff development, digital skills development, training in modern project management methods, and fostering an innovative organizational culture.

The implementation of agile methods for managing innovation projects plays a special role. The use of Agile, Scrum, Kanban, and other modern approaches can

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significantly reduce innovation development timelines, improve companies' adaptability to changing market conditions, and ensure more effective collaboration between project participants. Agile management methods are especially relevant for high-tech companies operating in highly uncertain environments.

An equally important area is the development of open innovation and partnerships. Modern enterprises can no longer effectively implement innovation solely through internal resources. Collaboration with universities, research organizations, technology companies, startups, and government development institutions accelerates the creation of new technologies, reduces research costs, and expands opportunities for the commercialization of innovative developments.

The use of a knowledge management system facilitates the improvement of innovation efficiency. The development of corporate knowledge bases, the use of digital collaboration platforms, and the creation of mechanisms for sharing professional expertise significantly accelerate the dissemination of innovative solutions within the organization and improve the quality of management decisions.

Ensuring information security is a key prerequisite for successful digital transformation. The growth of digital data and the use of cloud technologies require the creation of a reliable information security system, the prevention of cyber threats, and the protection of enterprise intellectual property. Therefore, digital security issues must become an integral part of the innovation management system.

The effectiveness of innovation management in the digital economy is determined by a company's ability to ensure sustainable innovative development, quickly adapt to changes in the external environment, and efficiently utilize available resources. Implementing the proposed management improvements not only enhances innovation but also improves the company's economic performance.

One of the key results of implementing the digital strategy is the reduction in innovation development and implementation timelines. The use of digital platforms, automated project management processes, and analytical tools

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significantly accelerate management decision-making and improve the efficiency of departmental coordination. This helps reduce the time to market for new products and strengthen the company's competitive position.

A significant benefit is the improved quality of management decisions. The use of artificial intelligence technologies, big data analysis, and business analytics systems provides managers with objective information on the company's performance, market dynamics, and the effectiveness of innovative projects. Decision-making based on analytical data reduces uncertainty and minimizes the risks of implementing innovative projects.

Developing digital competencies among employees also has a significant impact on innovation performance. Improving employee skills facilitates the more effective use of digital technologies, accelerates the company's adaptation to change, and stimulates the generation of new ideas. Fostering an innovative culture creates favorable conditions for the continuous improvement of production and management processes.

Expanding collaboration with external participants in the innovation ecosystem also has a positive impact. Interaction with research organizations, universities, startups, and technology companies provides access to modern knowledge, new technologies, and additional investment resources. This contributes to the accelerated commercialization of innovations and increased efficiency in research and development.

It should be noted that assessing the effectiveness of innovation management should be comprehensive. When analyzing results, it is necessary to consider not only financial indicators, but also the company's level of innovation activity, digital maturity, the speed of implementation of new technologies, the quality of management decisions, the level of automation of business processes, and customer satisfaction with innovative products.

Experience shows that companies that consistently implement digital transformation programs achieve higher rates of productivity growth, reduce operating costs, improve product quality, and strengthen their market position. Furthermore, the use of modern digital technologies enhances the investment attractiveness of organizations and expands opportunities for further innovative development [10].

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Conclusion

This study examined the theoretical foundations of enterprise innovation management and identified the specifics of its development in the digital economy. It was established that digital transformation has a significant impact on the content of innovation processes, changing management methods, decision-making mechanisms, and approaches to organizing innovation.

It was determined that the key factors for effective innovation management include the use of digital technologies, the development of digital infrastructure, the development of an innovation culture, staff development, and the integration of innovation strategy into the enterprise's strategic management system. At the same time, the key barriers to digital transformation were identified, the most significant of which include high investment costs, a shortage of specialists with digital competencies, information security risks, and insufficient digital maturity of organizations.

The paper proposes areas for improving innovation management, including developing a digital strategy, implementing modern information systems, developing human capital, applying agile project management methods, and expanding collaboration with innovation ecosystem participants. Implementing these measures will enhance innovation efficiency, accelerate the commercialization of new developments, and strengthen enterprise competitiveness.

The practical significance of this study lies in the potential use of the proposed recommendations in developing corporate digital transformation programs and innovative development strategies. Adopting a comprehensive approach to innovation management will enable companies to improve resource efficiency, ensure sustainable development, and successfully adapt to the challenges of the digital economy.

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