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## THE MAIN CONCEPTS AND PRACTICES FOR DIGITAL SUPPORT OF ENTERPRISE MANAGEMENT

## ОСНОВНІ КОНЦЕПЦІЇ ТА ПІДХОДИ ДО ЦИФРОВОГО ЗАБЕЗПЕЧЕННЯ УПРАВЛІННЯ ПІДПРИЄМСТВОМ

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*Ковтуненко Ю.В., Лозан А.Е., Нейков С.О. Основні концепції та підходи до цифрового забезпечення управління підприємством. Оглядова стаття.*

У статті досліджується важливість цифрового забезпечення управління (ЦЗУ) у сучасних підприємствах, що стикаються зі швидкими темпами технологічного розвитку. Основною метою є аналіз різних концепцій та підходів до оптимізації управлінських процесів за допомогою цифрових технологій. Дослідження охоплює ключові аспекти ЦЗУ, включаючи цифрову трансформацію, аналітику даних, інтернет речей (IoT), цифрову безпеку, штучний інтелект та машинне навчання. Результати показують, що ефективне впровадження цих технологій сприяє підвищенню ефективності, гнучкості та конкурентоспроможності підприємства. Перспективи подальшого розвитку ЦЗУ включають інтеграцію нових технологій, поліпшення методів обробки даних та увагу до етичних аспектів цифрових інновацій.

*Ключові слова:* технологічний розвиток, цифрові технології, управління підприємством, інтеграція, кваліфікований персонал, кібербезпека, цифрова трансформація

*Kovtunenکو Yu.V., Lozan A.E., Neykov S.O. The Main Concepts and Practices for Digital Support of Enterprise Management. Review article.*

The article explores the importance of digital management support (DMS) in modern enterprises facing rapid technological development. The main goal is to analyze various concepts and approaches to optimizing management processes with the help of digital technologies. The study covers key aspects of DMS, including digital transformation, data analytics, the Internet of Things (IoT), digital security, artificial intelligence, and machine learning. The results show that effective implementation of these technologies contributes to enterprises' efficiency, flexibility, and competitiveness. Prospects for further development of the DMS include integrating new technologies, improving data processing methods, and paying attention to the ethical aspects of digital innovations.

*Keywords:* technological development, digital technologies, enterprise management, integration, qualified personnel, cybersecurity, digital transformation

**I**n today's fast-paced technological landscape, enterprise management demands continuous reassessment and adaptation of strategies, processes, and resources. Digital management support, which involves the strategic use of digital technologies to enhance decision-making, optimize resources, and streamline operations, has become essential for maintaining competitiveness.

The ability to effectively integrate digital management support into various operational aspects is now a key determinant of enterprise success. This goes beyond the adoption of advanced tools and requires fostering a digital-first mindset and aligning technological initiatives with broader enterprise goals. When properly implemented, digital management support acts as a catalyst for innovation, driving growth and enabling organizations to remain competitive.

However, transitioning to a digitally-driven management framework presents significant challenges. Common obstacles include poor integration of new technologies with existing processes, leading to inefficiencies, and a shortage of qualified personnel to manage these technologies. This talent gap impairs enterprises' ability to fully execute digital strategies. Additionally, financial and infrastructural constraints often

hinder the ability to invest in and scale digital management solutions. This is particularly challenging for small and medium-sized enterprises, which may lack the necessary capital. The complexities of scaling digital solutions across different organizational levels further complicate progress.

These challenges highlight the need for a strategic approach to digital management support. Enterprises must address both technical and human resource constraints while developing an integrated strategy that aligns digital initiatives with business objectives. This approach ensures that digital technologies are fully leveraged, driving efficiency and fostering long-term competitiveness. Looking ahead, trends such as AI-driven decision-making and advanced data analytics will continue to shape digital management support. Enterprises that proactively adapt to these trends will be better positioned to navigate the complexities of the digital age.

### Analysis of recent researches and publications

To date, numerous domestic and international scholars have significantly contributed to shaping the concept of digital management support, particularly in the areas of managing innovative enterprise development and ensuring sustainable growth. Their research has advanced our understanding of enterprise development and the management of development processes. Notable contributions can be found in the works of M. Haustov, S. Kostenko, D. Tyshchenko, I. Yanenkov, O. Prodius, E. Shmygliuk, O. Makovoz, Y. Ogonovskyi, N. Kasyanova, Y. Mashtalar, and others. These scholars have explored the economic dimensions of "enterprise development" and "enterprise development management" and have developed various approaches, tools, and mechanisms to manage these processes effectively [1-10].

### Unsolved aspects of the problem

In today's rapidly evolving technological landscape, enterprises face several unresolved challenges that require further research to ensure effective management and sustained growth. One of the foremost issues is the need for deeper integration of digital technologies with existing business processes, addressing both technical and organizational aspects. This includes refining methods to seamlessly incorporate digital tools into established workflows. Additionally, there is a pressing need to develop and engage qualified personnel who can effectively utilize these digital tools. The optimization of investments in digital initiatives-encompassing financing models and the evaluation of investment efficiency-remains a critical area of focus. Ensuring robust cybersecurity and data protection is also essential, as these are foundational to the successful implementation of digital strategies.

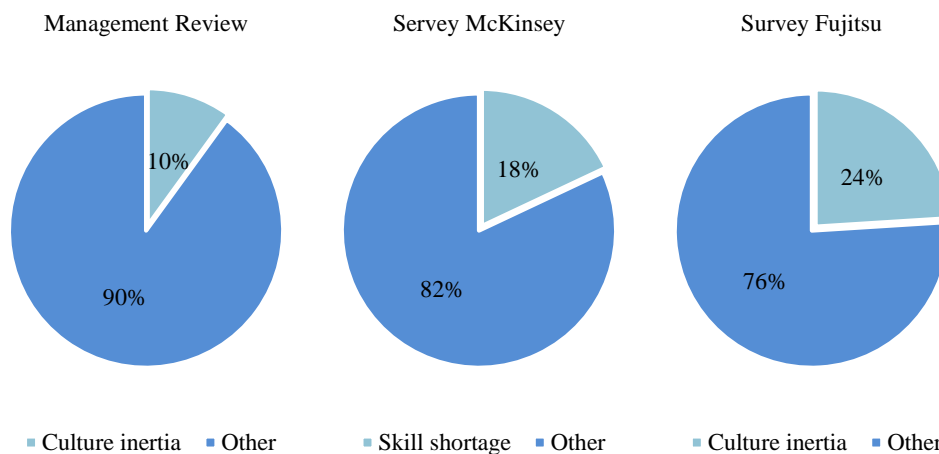


Figure 1. Results of surveys by MIT Sloan Management Review, McKinsey, and Fujitsu.

Source: compiled by authors on materials [11-13]

Furthermore, assessing the impact of digital technologies on enterprise productivity is vital for measuring the true value of these initiatives. Adapting to the fast-paced technological environment requires developing effective change management approaches that minimize risks while maximizing the benefits of new technologies.

Addressing these unresolved issues will enable enterprises to implement digital technologies more effectively, ultimately leading to a significant competitive advantage.

*The aim of the article is to review various concepts and practical approaches used in the modern business environment to optimize management with the help of digital technologies.*

### The main part

Digital Management Support (DMS) refers to a comprehensive set of measures aimed at leveraging digital technologies to enhance the efficiency and effectiveness of enterprise management. The concept of DMS encompasses general ideas, theoretical approaches, and foundational principles that guide the use of digital strategies in management. A concept may be broad and general, outlining an overarching philosophy or direction, or it may be more specific, and designed to apply within a particular context or area [2].

Several key concepts shape the modern practice of managing enterprises through digital technologies. These include digital transformation, data analytics, the Internet of Things (IoT), and digital security:

1. Digital transformation is the process of reimagining business models, operational processes, and enterprise strategies through the integration of digital technologies. Digital transformation involves the adoption of technologies such as the Internet of Things (IoT), artificial intelligence (AI), data analytics, and other innovative solutions [3].

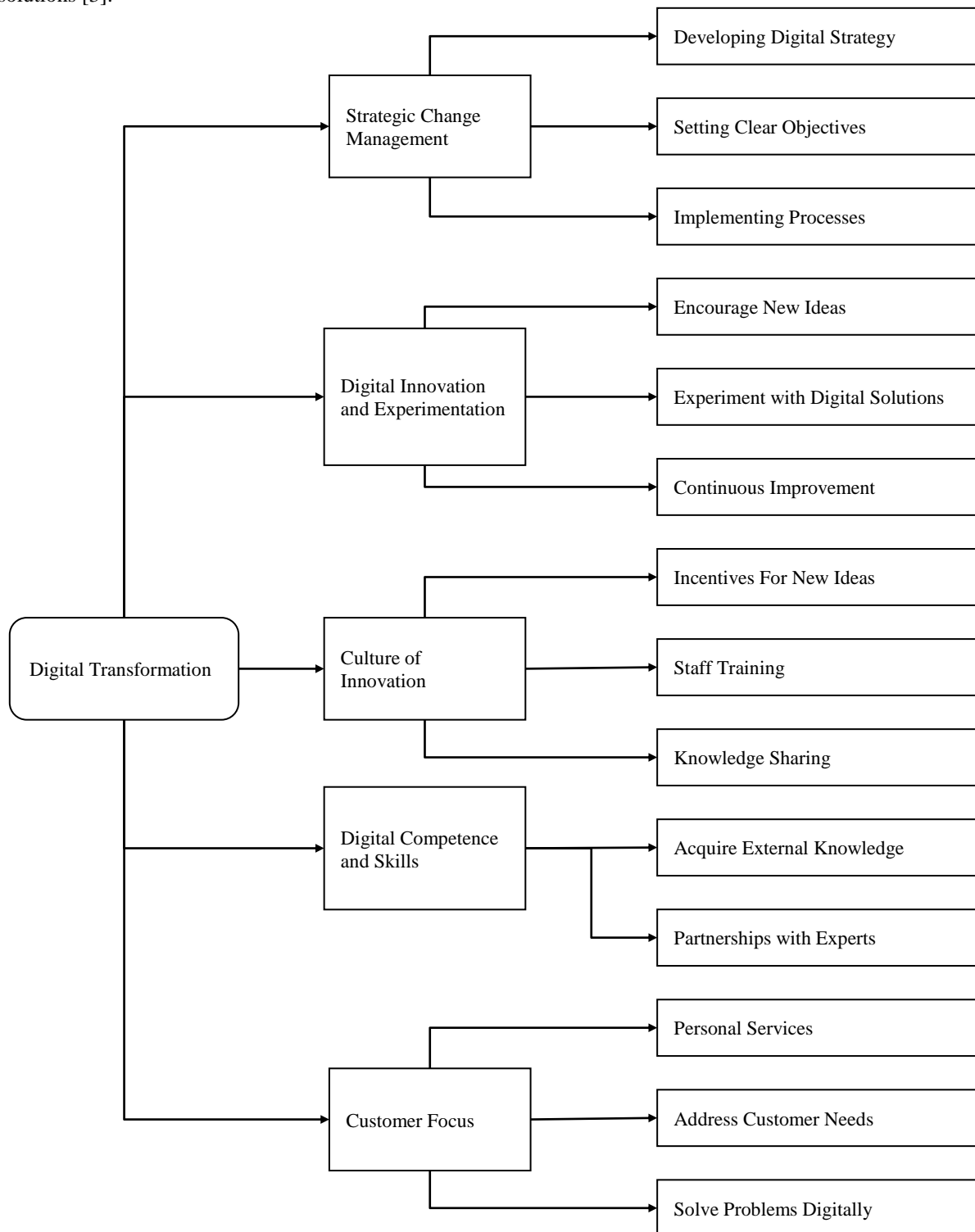


Figure 2. Concept of Digital transformation concept  
 Source: compiled by authors on materials [2, 3]

Within this concept, several approaches are critical (Figure 2):

- Strategic change management involves developing a well-defined digital transformation strategy, setting clear objectives, and implementing processes to ensure successful execution.

- Digital innovation and experimentation: Enterprises should foster an environment where employees are encouraged to introduce new ideas and experiment with digital solutions, driving continuous improvement and innovation.
  - Culture of innovation: This includes creating incentives for the implementation of new ideas, providing staff training, and establishing an open environment for knowledge sharing to stimulate creativity and collaboration.
  - Digital competence and skills: Enterprises must invest in training their staff in new technologies, as well as acquiring knowledge through external resources or partnerships with industry experts to stay ahead of technological advancements.
  - Customer focus: Leveraging digital technologies to enhance the customer experience is paramount. This includes providing personalized services, addressing customer needs, and solving problems more effectively through digital means [4].
2. Data analytics is a powerful tool that enables companies to gain insights into market trends, forecast demand, enhance processes, and optimize strategies [5].

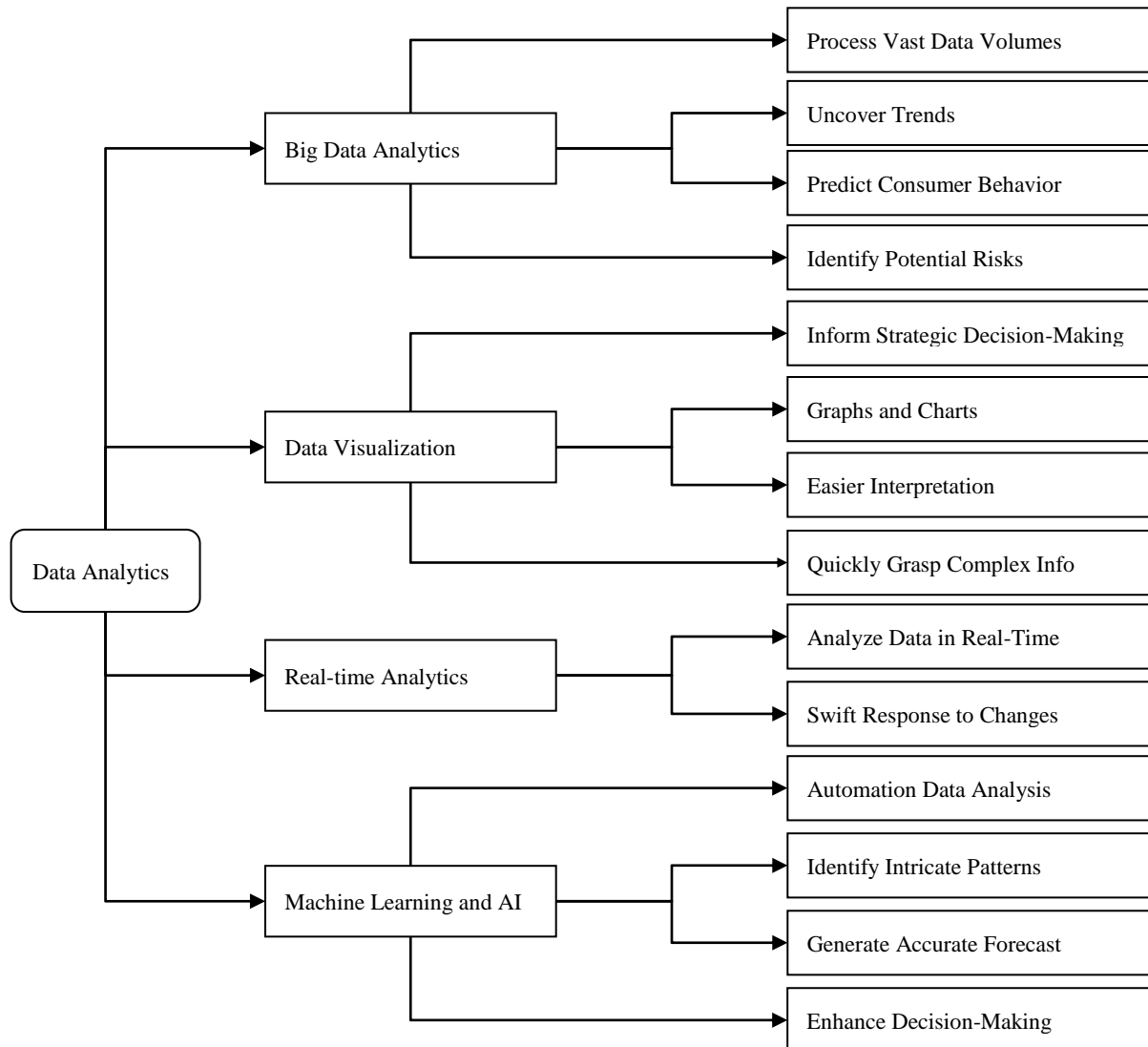


Figure 3. The concept of Data analytics

Source: compiled by authors on materials [6-8]

The following approaches are integral to this concept (Figure 3):

- Big data analytics: This involves processing and analyzing vast volumes of data to uncover trends, predict consumer behavior, identify potential risks, and inform strategic decision-making.
- Data visualization: Presenting data through graphs, charts, and other visual formats facilitates easier interpretation and analysis, enabling stakeholders to quickly grasp complex information.
- Real-time analytics: This approach processes and analyzes data in real-time, allowing companies to swiftly respond to changes in the business or market environment.

— Machine Learning and Artificial Intelligence: These technologies automate data analysis, identify intricate patterns, and generate accurate forecasts, significantly enhancing decision-making processes [6].

3. The Internet of Things (IoT): The IoT refers to the interconnection of various devices through the Internet, enabling real-time data collection, remote monitoring, and the enhancement of production and customer service processes [7]. Enterprises can adopt several key approaches to implement IoT technology:

- Bottom-up approach: This approach begins by deploying sensors and IoT devices across different parts of the organization or production facilities. The data collected from these devices is then integrated into existing management and analytics systems.
- Top-down approach: This strategy is initiated at the leadership level, where an IoT strategy is developed, including the setting of goals, defining requirements, and allocating resources. The implementation then follows these strategic directives [8].
- Partnership approach: Enterprises can collaborate with IoT device vendors, software developers, or cloud service providers to jointly develop and implement IoT solutions, leveraging external expertise and resources.
- Mixed approach: This method combines elements of both the bottom-up and top-down strategies, ensuring comprehensive IoT implementation across the organization.
- Customer-focused approach: This approach prioritizes the needs and expectations of consumers in the development and implementation of IoT solutions, aiming to create products and services that closely align with end-user demands.

4. Digital security involves implementing advanced data and network protection practices to safeguard businesses against cyber intrusions and ensure the confidentiality of sensitive information [9]. Key approaches in this area include:

- Preventive approach: Establishes security measures such as using licensed software, deploying firewalls, and ensuring regular software updates to prevent potential threats.
- Detection and response: Focuses on developing mechanisms to detect threats and attacks in real-time and respond rapidly. This approach includes network monitoring, anomaly detection, and the formulation of incident response plans.
- Resilience strategy: Involves creating systems and processes that can recover quickly from an attack or other incidents. This includes backing up data and using systems designed for rapid recovery to maintain business continuity.
- Risk management: This entails analyzing potential threats and vulnerabilities, assessing the likelihood and impact of incidents, and developing strategies to mitigate these risks.
- Security ecosystem: Encourages the exchange of information on vulnerabilities, joint development and implementation of security standards, and collaborative initiatives to identify and respond to threats [10].

5. Artificial Intelligence and Machine Learning involve using advanced algorithms to automate processes, enhance forecasting accuracy, and deliver personalized experiences to customers. Key areas of implementation include:

- Computer vision: AI-driven algorithms are used to recognize and analyze images, with applications ranging from medical diagnostics and manufacturing quality control to security anomaly detection.
- Text analysis: AI is employed to process and analyze large volumes of text data, enabling the identification of trends, sentiment analysis, and content categorization.
- Robotic process automation (RPA): Software robots are utilized to automate routine tasks, improving operational efficiency and reducing the likelihood of errors.
- Personalized recommendations: Algorithms analyze customer preferences and behavior to deliver tailored recommendations, enhancing customer engagement and satisfaction.
- Supply chain management: AI and ML optimize logistics and supply chain operations by improving demand forecasting and route optimization.

## Conclusions

Digital Management Support (DMS) is a pivotal element in modern enterprises, driving efficiency, adaptability, and competitive advantage in today's dynamic market. This study highlights the increasing necessity of digital transformation, which has become essential for enterprises aiming to sustain their competitiveness. Central to this transformation is the adoption of advanced technologies such as artificial intelligence (AI), machine learning (ML), the Internet of Things (IoT), and data analytics.

Data analytics enables enterprises to make well-informed decisions by analyzing vast amounts of data, thereby enhancing the efficiency of business processes and improving the accuracy of forecasts. The application of AI and ML to personalize services allows enterprises to deliver tailored solutions to individual customers, significantly boosting satisfaction and loyalty. However, as the reliance on digital technologies grows, ensuring robust data security emerges as a critical challenge. Implementing best practices in cybersecurity is vital for safeguarding information and maintaining customer trust.

Looking ahead, the prospects for DMS are promising, particularly with the continued integration of AI and ML, which are set to play an increasingly significant role in business operations. The development of new

methods and algorithms will further enhance process automation and decision-making capabilities. Additionally, the expanded implementation of IoT offers new avenues for real-time data collection and analysis, enabling enterprises to respond more swiftly to changes and optimize their operations.

Advancements in big data processing and analysis will unlock even deeper insights from diverse data sources, leading to improved business processes and strategies. However, the growing use of AI and digital technologies also necessitates greater attention to ethical and legal considerations, including data privacy, algorithmic transparency, and accountability for decisions.

Digital technologies also empower enterprises to scale their operations on a global level, creating new market opportunities and growth potential. However, this global expansion requires careful adaptation to varying cultural and legal contexts. As digital governance continues to evolve, it presents new business opportunities. Enterprises that proactively embrace these technologies will gain a significant edge in today's competitive environment and are well-positioned for sustainable development in the future.

### Abstract

In today's world of dynamic technological development, managing enterprises requires constant review and adaptation of strategies, processes, and resources. The effective use of digital technologies is a key factor in the success of enterprises, but many companies face challenges in their implementation, such as insufficient integration of new technologies, lack of qualified personnel, and limited resources. This negatively affects management processes and competitiveness, making it an urgent task to address these issues.

Many domestic and foreign scholars have studied the economic content and mechanisms of enterprise development management. However, in the context of modern technological development, a number of unresolved issues remain, including the integration of digital technologies with existing business processes, the development of qualified personnel, optimization of investments in digital initiatives, cybersecurity, and assessment of the impact of technology on enterprise productivity.

The purpose of the article is to consider various concepts and practical approaches to optimizing management with the help of digital technologies. Digital management support (DMS) includes the use of digital technologies to improve the efficiency and effectiveness of management. The main concepts of DMS include digital transformation, data analytics, the Internet of Things (IoT), and digital security.

Digital transformation involves the transformation of business models and operational processes using technologies such as IoT, artificial intelligence (AI), and data analytics. It involves strategic change management, digital innovation, a culture of innovation, the development of digital competence, and a customer focus. Data analytics allows companies to understand market trends, forecast demand, and optimize strategies using approaches such as big data analytics, data visualization, and machine learning.

The Internet of Things (IoT) enables real-time data collection and improves production and customer service processes. Approaches to IoT implementation include bottom-up, top-down, partnership, and user-centered. Digital security is about protecting data and networks from cyber threats and includes a preventive approach, detection and response, reliability strategy, and risk management. Artificial intelligence and machine learning automate processes, improve forecasting accuracy, and provide personalized customer service.

The main findings of the study include the growing importance of digital transformation, the increasing role of data analytics in decision-making, the use of AI and ML to personalize services, and the need to ensure cybersecurity. Prospects for the DMS include further integration of AI and ML, development of IoT technologies, big data processing and analysis, and attention to ethical and legal aspects of digital technologies.

Digital management support is a critical element for modern enterprises, ensuring their efficiency, flexibility, and competitiveness. The active implementation of these technologies gives enterprises significant advantages in today's competition and contributes to their future sustainable development.

### Список літератури:

1. Хаустова М.Г. Вигоди, ризики та проблеми цифровізації суспільства: загальнотеоретичний аспект. Аналітично-порівняльне правознавство. 2023. № 5. С. 753-759.
2. Костенко С.В. Концепції цифрового управління як чинник конкурентоспроможності. Геостратегічні трансформації та траєкторія національної безпеки в контексті відбудови і сталого розвитку України: матеріали Міжнародної науково-практичної конференції (м. Запоріжжя, 25-26 травня 2023 р.). Запоріжжя, 2023 С. 644.
3. Тищенко Д.С. Цифрова трансформація як драйвер розвитку економіки. Цифрова економіка та економічна безпека. 2023. №. 4 (04). С. 38-45.
4. Яненко І.Г. Цифрова трансформація промисловості України: ключові акценти. Проблеми економіки. 2017. №. 4. С. 179-184.
5. Продіус О.І., Максимичева І.М. Глобалізація та цифрова трансформація в сфері обслуговування клієнтів. Сучасний менеджмент економічних систем в координатах парадигми сталого розвитку:



- матеріали V Міжнародна науково-практична конференція (м. Одеса, 18 вересня, 2023р.). Одеса. 2023. С. 120.
6. Постніков О.О., Смерічевська С.В. Трансформація аналітики великих баз даних в управлінні закупівлями з розвитком штучного інтелекту. Вісник економічної науки України. 2023. № 1 (44). С. 77-85.
  7. Маковоз О., Лисенко С. Інтернет речей (IoT) у цифровій трансформації бізнес-процесів ІТ компаній. Бізнес-моделі для сталого розвитку: виклики та цифрова трансформація: матеріали Міжнародної науково-практичної конференції (м. Харків, 15-16 лютого, 2024 р.). Харків, 2024. С. 261.
  8. Огоновський Ю. Прототип інформаційної системи моніторингу та контент-аналізу звернень мешканців «Розумного міст». Інформаційні системи та мережі. 2023. Вип. 13. С. 24-45. DOI: 10.23939/sisn2023.13.0244
  9. Лисецький, Ю.М., Калбазов Д.Й. Підходи до забезпечення інформаційної безпеки. Математичні машини і системи. 2023. №.4. С. 26-32.
  10. Машталяр Я., Козачек В., Бржевська З., Богданов О. Дослідження розвитку та інновації кіберзахисту на об'єктах критичної інфраструктури. Електронне фахове наукове видання «Кібербезпека: освіта, наука, техніка». 2023. Т. 2. №. 22. С. 156-167.

## References:

1. Khaustova, M.H. (2023). Benefits, risks and problems of digitalization of society: A general theoretical aspect. *Analytical and Comparative Jurisprudence*, 5, 753-759 [in Ukrainian].
2. Kostenko, S.V. (2023). Concepts of digital governance as a factor of competitiveness. In *Geostrategic transformations and the trajectory of national security in the context of the reconstruction and sustainable development of Ukraine: Proceedings of the International Scientific and Practical Conference* (p. 644). Zaporizhzhia [in Ukrainian].
3. Tyshchenko, D.S. (2023). Digital transformation as a driver of economic development. *Digital Economy and Economic Security*, 4(04), 38-45 [in Ukrainian].
4. Yanenkova, I.H. (2017). Digital transformation of Ukraine's industry: Key focuses. *Problems of the Economy*, 4, 179-184 [in Ukrainian].
5. Prodius, O.I., & Maksimicheva, I.M. (2023). Globalization and digital transformation in customer service. In *Modern management of economic systems in the coordinates of the sustainable development paradigm: Proceedings of the V International Scientific and Practical Conference* (p. 120). Odessa [in Ukrainian].
6. Postnikov, O.O., & Smerichevska, S.V. (2023). Transformation of big data analytics in procurement management with the development of artificial intelligence. *Bulletin of Economic Science of Ukraine*, 1(44), 77-85 [in Ukrainian].
7. Makovoz, O., & Lysenko, S. (2024). The Internet of Things (IoT) in the digital transformation of IT companies' business processes. In *Business models for sustainable development: Challenges and digital transformation: Proceedings of the International Scientific and Practical Conference* (p. 261). Kharkiv [in Ukrainian].
8. Ohonovsky, Y. (2023). Prototype of an information system for monitoring and content analysis of residents' appeals in a "Smart City". *Information Systems and Networks*, 13, 24-45. DOI: 10.23939/sisn2023.13.0244 [in Ukrainian].
9. Lysetskyi, Y.M., & Kalbazov, D.Y. (2023). Approaches to ensuring information security. *Mathematical Machines and Systems*, 4, 26-32 [in Ukrainian].
10. Mashtaliar, Y., Kozachek, V., Brzhevska, Z., & Bohdanov, O. (2023). Research on the development and innovation of cybersecurity for critical infrastructure facilities. *Electronic Professional Scientific Publication "Cybersecurity: Education, Science, Technology"*, 2(22), 156-167 [in Ukrainian].

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