УДК 005.3:004.9 https://doi.org/10.31713/ve1202521
JEL: M15, M11, D83, O33, D81

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SMART SOLUTIONS IN THE ERA OF DIGITAL TRANSFORMATION AS NEW HORIZONS FOR MANAGEMENT

The article explores the concept of smart solutions as an innovative approach to managerial decision-making in the context of ongoing digital transformation. It emphasizes the significance of integrating information and communication technologies (ICT), such as artificial intelligence, big data analytics, cloud computing, and decision support systems, into the core of management processes. The study identifies key advantages of smart solutions over traditional decision-making models, including enhanced efficiency, accuracy, flexibility, scalability, and collaborative capacity. The article synthesizes contributions from leading scholars in international and Ukrainian contexts. It analyzes current barriers to implementing smart solutions, including organizational inertia, ethical dilemmas, and lack of digital competencies among managers. It also outlines the critical role of strategic thinking in successful digital adaptation and provides practical recommendations for organizations seeking to implement smart solutions effectively.

Keywords: smart solutions; decision-making; management; organization; leadership; digital transformation; smart-management; managerial decision-making; information and communication technologies (ICT); Big Data; artificial intelligence (AI); digital competences.

Formulation of scientific problem and its significance. The current stage of societal development is characterized by rapid digital transformation, encompassing all areas of the economy, including management. This process goes beyond the introduction of new technologies – it entails a shift in thinking paradigms, business process structures, and the role of the manager within organizations. The use of information and communication technologies (ICT), such as artificial intelligence, big data, cloud computing, the Internet of Things (IoT), and decision support systems, is fundamentally reshaping management approaches by setting new standards for efficiency, effectiveness, and

transparency in managerial actions. Successful adaptation to digital change requires not only technological upgrades, but also a profound rethinking of management approaches, organizational processes, and leadership styles.

In an environment of high market dynamics, unpredictable change, globalization, and increasing complexity of both internal and external business processes, the need for fast, accurate, and flexible managerial decisions has become not just relevant but a key factor of competitiveness. Traditional decision-making methods based on experience and intuition gradually give way to intelligent approaches grounded in data analytics, automation, and digital modeling of development scenarios. In this context, the study of smart solutions – tools that integrate the capabilities of digital technologies with intelligent support for management processes – becomes particularly relevant. It implies using integrated digital tools to make informed managerial decisions in real time, accounting for various variables, risks, and stakeholder needs. This approach enables not only a prompt response to challenges but also their prediction, thus forming a proactive management model. Digital transformation, therefore, creates new horizons for management, altering the nature of managerial activity and the demands placed on modern managers. They must now possess not only classical management skills but also digital competencies, strategic thinking, and the ability to adapt swiftly to technological change.

The chosen research direction enables the integration of theoretical aspects of modern management with the practical potential of digital tools. It provides an opportunity to analyze how smart solutions transform classical management functions. Furthermore, the study of this topic contributes to the development of new approaches to management education, the enhancement of managers' digital competencies, and the establishment of a new management culture that aligns with the challenges of the 21st century. Therefore, the topic is driven by the need for a comprehensive analysis of the role of smart solutions in the transformation of modern management, the assessment of their impact on organizational effectiveness, and the development of recommendations for their implementation in managerial practice.

Analysis of recent research and publications. The issue of managerial decision-making has long attracted the attention of scholars, who have explored it from various perspectives – from psychological factors to organizational contexts and technological support. Classical

approaches were shaped by prominent researchers such as H. Simon, who introduced the concept of bounded rationality and substantiated the decision-making process under complex conditions. D. Kahneman and A. Tversky contributed significantly by studying cognitive biases and the behavioural aspects of decision-making. Henry Mintzberg proposed a model of managerial roles in which decision-making is regarded as a core managerial function. At the same time, I. Adizes explored management styles in the context of organizational development. P. Drucker and M. Porter focused on strategic management and emphasized the role of high-quality decisions in ensuring organizational competitiveness. In the context of digital transformation, important contributions have been made by T. H. Davenport, A. McAfee, and E. Brynjolfsson, who examine the influence of big data, artificial intelligence, and digital platforms on managerial decision-making [1].

Among Ukrainian scholars, notable contributions include the work of A. Kolot, who analyses the social and labor dimensions of management during periods of transformation, and V. Heyets, who investigates strategic management of economic systems under conditions of instability. I. Shkola's research focuses on the justification of managerial decisions in multifactorial environments. O. Kendyukhov and L. Shkvarchuk explore the digital transformation of management processes, the development of digital competencies among managers, and innovations in managerial practice. The studies of Svitlana Karpus and M. Bilous concentrate on implementing information and communication technologies and decision support systems in the management of modern organizations [2]. The synthesis of these scientific approaches provides a solid foundation for further exploration of smart solutions in the digital era. It supports the search for new methods to enhance the effectiveness of managerial activities.

Despite the substantial body of existing research, certain aspects of the impact of managerial decision-making in the digital environment remain insufficiently explored. In particular, further analysis is needed regarding integrating smart solutions into enterprise management systems, assessing their effectiveness, determining the role of digital technologies in enhancing the quality of managerial decisions, and developing new competencies required of managers in the digital era.

The article aims to conduct a comprehensive study of the concept of smart solutions as a tool for effective management in the context of

the digital transformation of the business environment. The research aims to identify the role of modern information and communication technologies in shaping a new management paradigm based on data-driven decision-making, adaptability, and rapid response to change. It also explores the potential of digital tools – such as artificial intelligence, big data analytics, cloud services, and decision support systems – for improving management efficiency across various organizations. In addition, the article seeks to identify the practical aspects of implementing smart solutions, taking into account the barriers, risks, and needs of contemporary management. This will allow for developing actionable recommendations for managers to support their adaptation to the digital environment.

Presentation of the main material. Digital transformation is a comprehensive process involving integrating digital technologies into all aspects of business operations, resulting in profound changes in how organizations manage, produce, and interact with customers and other market participants. It goes beyond implementing new technologies and entails a fundamental rethinking of internal processes, business models, and corporate culture [3]. While specific solutions are unique to each business, the results often focus on improving IT efficiency and effectiveness, increasing employee productivity, reducing time to market, increasing flexibility with larger systems, improving sales and marketing, increasing IT security, etc. Digital business transformation is a technological process, not a one-time transformation, but its results transform the business forever [4].

Digital transformation has become a key driver of change in management, compelling companies to rethink their managerial approaches and integrate innovative technologies across all areas of operation. The core components of digital transformation in management include artificial intelligence, big data, blockchain technologies, automated decision-making systems, and cloud computing. These tools enable organizations to optimize management processes, enhance operational efficiency, and maintain high levels of competitiveness in a rapidly changing market environment [5]. For example, big data enables enterprises to rapidly analyze vast volumes of information, identify trends, and anticipate potential risks, thereby enhancing the validity of managerial decisions. Artificial intelligence automates processes, personalizes customer interactions, and improves strategic planning. Meanwhile, blockchain technologies help increase business operations'

transparency and security [6].

The availability of digital management approaches creates a number of opportunities that managers did not have before. In particular, O. H. But-Gusaim and K. V. Kovtunenko highlight unlimited information, shared decision-making, speed and efficiency of response [7]. However, in our view, this list should be expanded to include several other important aspects that become accessible by implementing smart solutions. These include the ability to forecast development scenarios using big data analytics, personalize managerial decisions based on the needs of individual departments or consumers, automate routine management functions, enhance transparency and process controllability, and enable real-time decision-making. Moreover, digital tools create an adaptive management environment capable of responding rapidly to risks, identifying deviations, and making decisions based on data rather than intuition. Thus, digital technologies not only transform the decision-making process but also significantly broaden managerial capabilities – enhancing the flexibility, predictability, and overall effectiveness of management activities.

Digital transformation fundamentally reshapes traditional management models, which were previously based on hierarchical structures, rigid planning, and manual decision-making. In the digital environment, there is a growing emphasis on flexible organizational structures, network-based coordination, project-oriented approaches, and team self-organization. Managers are increasingly moving away from authoritarian leadership styles toward partnership-oriented models that actively engage employees in decision-making processes. Simultaneously, the nature of the decision-making process is evolving – becoming more data-driven, rapid, and automated. The focus of managerial attention has shifted from solely achieving results to analyzing processes, implementing flexible KPI frameworks, ensuring continuous monitoring, and maintaining the capacity to adapt to real-time changes. This shift necessitates a new set of competencies for managers, including digital literacy, data proficiency, a solid understanding of digital systems, and strong analytical thinking skills.

Thus, digital transformation is reshaping not only management tools and methods but also the very philosophy of management. Organizations are shifting from rigid, centralized structures to more open, dynamic, and adaptive systems capable of operating effectively

amid constant change and high uncertainty. Within this context, a new management paradigm is emerging – one that combines digital technologies, flexible thinking, and a strong orientation toward innovation. This evolution has led to the development of the concept of Management 4.0, which represents the next stage in the progression of management approaches: from Management 1.0 (hierarchical control), to Management 2.0 (process-oriented), to Management 3.0 (innovative and people-centric), and ultimately to digitally adaptive Management 4.0. This latest paradigm involves the comprehensive integration of digital technologies into all management areas, including strategic planning, organizational design, motivation, control, and communication. Management 4.0 is grounded in digital interaction, artificial intelligence, process automation, and a culture of continuous change and innovation. Its core principles include transparency, flexibility, adaptability, open collaboration, and a focus on delivering value to all stakeholders within the business ecosystem. This approach not only enhances managerial efficiency but also supports long-term business sustainability in a volatile and technologically advanced environment.

Overall, digital transformation opens up new opportunities for management by enhancing flexibility, responsiveness, analytical precision, and the personalization of managerial decisions. At the same time, it introduces new demands on management practices – necessitating the revision of traditional decision-making models, the adoption of modern digital tools, and the modernization of managerial approaches. In this context, the concept of smart solutions is gaining increasing significance – both as a response to the challenges of the digital era and as a powerful instrument for shaping an effective and adaptive management system.

The concept of smart solutions refers to a management approach that leverages digital technologies, data analytics, and intelligent systems to support and enhance managerial decision-making.

Traditional approaches to decision-making in management rely heavily on the personal experience, intuition, and expert judgment of managers, often based on limited or incomplete information. Decisions are frequently made under conditions of uncertainty, without comprehensive analysis of alternatives or modeling of potential consequences. While such an approach may be acceptable in stable environments, it becomes increasingly ineffective in the face of high market dynamics, digital competition, and the growing complexity of

business processes. In contrast, smart solutions are grounded in the systematic application of digital technologies – particularly artificial intelligence, big data analytics, cloud computing, and integrated information systems. A defining feature of smart solutions is their data-driven nature: decisions are made based on real-time, objective data, which helps reduce subjectivity, minimize risks, and improve the ability to respond quickly to change.

Smart solutions offer several advantages over traditional approaches to managerial decision-making, primarily due to their technological foundation and advanced analytical capabilities. One of the key benefits is efficiency: automated processes and continuous data monitoring enable decisions to be made much faster than through manual analysis. Accuracy is another major strength of smart solutions, achieved through the application of big data analytics, which allows for consideration of a wide range of variables and reduces the likelihood of managerial errors. Flexibility is also a critical feature, referring to the system's ability to rapidly adapt actions in response to changes within the enterprise and the external market environment. Smart solutions are also highly scalable, allowing for implementation at various management levels, from operational units to strategic leadership, while maintaining consistency in approaches and standards. Moreover, they support collaborative decision-making through digital platforms, facilitating real-time interaction and coordination among team members. Collectively, these advantages contribute to the emergence of a new quality of managerial activity within the context of digital transformation.

It is important to note that smart solutions do not replace managers but augment their capabilities through technological support. While traditional approaches place the individual at the center of decision-making, smart solutions foster effective interaction between people, technology, and data, enabling a fundamentally new level of management effectiveness.

The advantages of smart solutions are primarily attributed to the active use of modern digital technologies, which provide both the technical and intellectual foundation for effective managerial decision-making. Information and communication technologies (ICT) play a pivotal role in realizing the potential of smart management by enabling data integration, process automation, information visualization, and digital interaction among all participants within the management system. As a

result, ICTs have become fundamental tools for implementing smart solutions in contemporary management practice. They not only accelerate communication processes within organizations but also enable more accurate, well-founded, and adaptive managerial decision-making. It is through ICTs that the potential of automated and data-driven management approaches is fully realized.

Key digital tools utilized within the framework of smart management include ERP systems (Enterprise Resource Planning), CRM systems (Customer Relationship Management), BI platforms (Business Intelligence), cloud services, artificial intelligence, and machine learning technologies, as well as decision support systems (DSS). These tools facilitate the effective integration of internal and external data sources, the creation of dynamic dashboards, the modeling of alternative scenarios, and the forecasting of potential outcomes of managerial actions. The Internet of Things (IoT) plays a distinct role by enabling real-time data collection from physical objects. Additionally, tools for remote collaboration, such as Microsoft Teams, Zoom, and Slack, enhance communication flexibility in decentralized and hybrid work environments.

ICTs also contribute to the democratization of the management process by increasing transparency, data accessibility, and openness across different levels of managerial personnel. This fosters the development of a collective digital environment in which decisions can be made more quickly, effectively, and with reduced risk. In such an environment, managers are not only able to monitor execution but also to formulate strategies based on accurate, up-to-date, and visualized data. Thus, information and communication technologies are not merely auxiliary tools but a core element of smart management – providing a qualitatively new level of decision-making and organizational effectiveness in the context of digital transformation.

Despite the clear advantages of smart solutions, their implementation in managerial practice is accompanied by several challenges and limitations that can significantly hinder or even halt the digital transformation of organizations. These challenges are both technical and social in nature and require a comprehensive, multidimensional approach to address them effectively.

One of the primary obstacles to the adoption of smart solutions is the presence of organizational barriers to digital transformation. These include institutional inertia, employee resistance to change, lack of a

coherent digital strategy, and limited financial resources. In many cases, management underestimates the value of digital tools or is unprepared for a comprehensive modernization of managerial processes. Another common issue is fragmented implementation, whereby digital solutions are applied in isolated areas without a systemic approach, ultimately reducing their overall effectiveness.

Integrating smart solutions also brings risks related to data privacy, cybersecurity, algorithmic transparency, and their influence on decision-making processes. Automating managerial functions may result in a loss of control over specific decisions, the emergence of discriminatory outcomes due to algorithmic bias, or violations of labor rights stemming from excessive digital surveillance. Ethical dilemmas arise concerning the balance between human and machine decision-making, accountability, and transparency in using artificial intelligence.

Another significant challenge is the insufficient level of digital literacy among managerial staff. Implementing smart solutions requires not only technological upgrades but also a transformation in managerial thinking. Modern managers must possess digital competencies, including the ability to work with analytical systems, understand the functioning of digital platforms, and interpret algorithms and data models. Without these skills, even well-developed digital infrastructure may lead to superficial or erroneous decisions.

Therefore, the development of a digital culture and digital competencies among management personnel is a strategic priority for organizations seeking to achieve lasting success from digital transformation efforts.

Conclusions. In the context of rapid business digitalization, smart solutions serve not only as tools for improving efficiency but also as strategic enablers of organizational development. The prospects for their continued implementation lie in the deeper integration of digital tools across all levels of management, the advancement of personalized analytics, automated decision-making, and the use of artificial intelligence for strategic forecasting. In light of this, organizations should develop a comprehensive digital strategy that defines the directions of transformation, sets clear goals and priorities, and outlines the expected outcomes of smart solution implementation. This includes investing in modern IT infrastructure, cloud platforms, analytical systems, and automation technologies; fostering a culture of openness to change;

providing employees with digital skills training; building internal digital communities; and designing flexible organizational structures capable of adapting rapidly to environmental changes through data-driven management support.

Strategic thinking on the part of managers plays a crucial role in this process, becoming a key factor in successful digital adaptation. In the digital era, strategic thinking must encompass not only an understanding of the immediate benefits of technology adoption but also a consideration of long-term consequences, potential risks, and emerging opportunities. Leaders should view digital solutions not as isolated tools but as integral components of a transformational strategy that drives competitiveness, innovation, and organizational sustainability in an evolving business landscape. Thus, the implementation of smart solutions must be accompanied not only by technological upgrades but also by a transformation in the management mindset – one that integrates analytics, adaptability, and strategic foresight as core elements of modern leadership.

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SMART-РІШЕННЯ В ЕПОХУ ЦИФРОВОЇ ТРАНСФОРМАЦІЇ ЯК НОВІ ГОРИЗОНТИ ДЛЯ МЕНЕДЖМЕНТУ

У статті розглядається концепція smart-рішень як інноваційного підходу до ухвалення управлінських рішень в умовах активної цифрової трансформації бізнес-середовища. Акцентовано увагу на важливості комплексної інтеграції сучасних інформаційно-комунікаційних технологій (ІКТ) у процеси менеджменту, зокрема таких як штучний інтелект, аналітика великих даних, хмарні обчислення, Інтернет речей (IoT) та системи підтримки прийняття рішень. Показано, що цифровізація

управлінських процесів сприяє формуванню нової управлінської парадигми, яка ґрунтується на швидкості, гнучкості, точності, прозорості та аналітичному підході до прийняття рішень. У дослідженні проаналізовано основні переваги smart-рішень порівняно з традиційними управлінськими підходами, серед яких: оперативність, зниження суб'єктивності, підвищення точності прогнозування, масштабованість та підтримка колективного прийняття рішень. Окрему увагу приділено трансформації ролі менеджера, який у цифрову епоху має володіти не лише класичними управлінськими навичками, а й цифровими компетентностями, аналітичним мисленням і здатністю до стратегічного бачення. В статті виокремлено ключові виклики, що постають перед організаціями у процесі цифровізації: організаційна інерція, спротив змінам, етичні дилеми використання цифрових технологій, ризики алгоритмічного управління та нестача цифрових навичок у керівників. Запропоновано практичні рекомендації щодо впровадження smart-рішень в управлінську діяльність, які включають стратегічне планування цифрових змін, розвиток цифрової компетентності персоналу, побудову відкритої та адаптивної організаційної структури. Підкреслюється роль стратегічного мислення як ключового чинника успішної цифрової адаптації. Результати дослідження сприяють поглибленню розуміння потенціалу цифрових технологій для трансформації класичних управлінських функцій, а також слугують основою для розробки ефективних моделей smart-менеджменту, здатних забезпечити конкурентоспроможність організацій в умовах цифрової економіки.

Ключові слова: smart-рішення; прийняття рішень; менеджмент; організація; лідерство; цифрова трансформація; smart-менеджмент; прийняття управлінських рішень; інформаційно-комунікаційні технології (ІКТ); великі дані; штучний інтелект (ШІ); цифрові компетенції.

Отримано: 22 березня 2025 року
Прорецензовано: 27 березня 2025 року
Прийнято до друку: 28 березня 2025 року