Leadership in the Era of Sustainable Development: Challenges and Opportunities for Modern Managers

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Abstract. Modern technologies have a large-scale impact on the transformation of management functions, management tools and methods, and managerial competencies, raising the question of how companies will be managed in the near future. The article provides an overview of management development trends with a focus on the contours of the emerging management paradigm of the digital age. The information basis for the analysis is the work of leading foreign and domestic experts in the field of management, as well as articles selected by keywords. It is shown that the concept of management of the digital era is developing dynamically, with the contours of the emerging paradigm being a field for professional discussions and experiments. It is noted that the management of organisations in the digital age requires new modern competencies from managers. Remote employment is gradually becoming a new global working norm, opening up huge opportunities for companies, but also requiring a different kind of leadership – "digital". This new type of leadership implies significant changes in the relationship between managers and employees, including leadership behaviour. The author demonstrates the potential of using the concept of digital leadership in studies of new working and management conditions. The trends in the development of modern management, as well as the new competencies of managers identified in the analysis, are of interest to researchers and management practitioners, although they require further analysis as technologies and management practices evolve.

Keywords: digital leadership, artificial intelligence, competences, management 4.0, digital economy.

JEL Classification: J53, J54, M54.

INTRODUCTION

In today's context of the global world's exponential demand for sustainable development, the role and importance of the leadership model comes to the fore. It is the leader, with his or her task of driving change and transformation not only in business but also in society, who becomes the key to real daily targeted actions of teams towards sustainable development goals. After all, achieving these goals is a process directly related to the management of an organisation. As an independent type of professional activity aimed at achieving the goals and objectives of a particular organisation, the management process is directly related to the changes taking place in the economy as a whole.

Changes in the external environment of business structures have led to the transformation of the management of modern companies. Management as a science, theory and art of managing industrial companies emerged at the turn of the 20th century in the midst of a boom in industrial production and growing markets. At the beginning of the 20th century, the business environment of companies, both external and internal, underwent radical changes under the influence of technological innovations, globalisation, international trade liberalisation, and

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radical changes in market competition and consumer behaviour. The sharp challenges of the external environment, together with structural problems caused by the rapid growth of digital technologies and the transition to new technological modes, have determined changes in the management of both national and large international companies.

Digital transformation is fundamentally changing organisational areas of activity, such as customer experience, organisational structure, decision-making methods, and is leading to the formation of a new management concept called Management 4.0. The scientific basis for the article was the research of scientists from around the world in the field of digitalisation, digital transformation of the economy, management and leadership, namely: Barro S. (2019), Baranov V. V. (2021), Boyda S. (2022), Brunelle E (2021), Busse R., (2020), Duan Y., Dwivedi Y.K. (2019), Djur O., (2023), Doroshkevich D. V. (2022), Flood F. (2019), Haleem A. (2023), Huang M-H. (2019), Kaplan A., (2019), Liu C., Van Wart M., Kim S., Wang X., McCarthy A., Ready D. (2020), Lytvynenko I. S. (2022), Lozovsky O. M. (2019), Mitchell M. (2019), Nakrošiene A., Buciuniene I., Goštautaite B (2019), Oliynyk I. (2023), Porter M. (2014), Reznik N. P. (2019), Rudyka V. I. (2021), Roman A. V., Van Wart M., Wang X., Liu C., Kim S., McCarthy, A. (2019), Svinariova G. B. (2020), Sedikova I. O. (2022), Tong Schraa-Liu, Fons Trompenaars (2021), Van Wart M. (2019).

The scientific problem of the research was to study the specific features of the management process and prospects in the activities of managers in the context of the digital transformation of the economy. The challenges of sustainable development dictate new rules for leadership strategies in the world. In this regard, the role of the manager in changing the behaviour of employees and the organisation in the right direction comes to the fore, determining the long-term impact of innovative projects and tasks being implemented.

Nevertheless, it is possible to identify the main contradictions that have developed in modern management:

-between the high speed of change in the digital environment and the traditional approach to building management systems focused on stability;

-between the complexity of forecasting the need for new managers for the company's external activities and the rapid aging of the knowledge and competencies of managers and employees in the digital environment;

-between the digital skills gap between managers and employees and labour market transformations that are increasing the turnover of digital talent and leaders;

-between exclusive and inclusive approaches to HR management and the need for a broader pluralistic view of human resource management systems in the digital environment;

-between organisational HR strategies focused on growing talent from within or acquiring it from the labour market;

-between the management cycle based on the model of investing in a digital management portfolio or employee skills.

The identified contradictions allow us to outline the problematic field of research and indicate the symptoms of the crisis of the modern management system of companies and the need for its further development in the new digital context. Thus, the construction and development of the digital economy leads to global changes in various sectors of the economy and the construction of new business models of organisations, which creates new challenges and requirements for the work of managers.

The relevance of the study is to consider the digital transformation of management on the basis of a systematic approach as a field of activity aimed at accumulating knowledge and skills in the use of digital technologies to improve the organisation's management process in the context of sustainable leadership. The research hypothesis put forward by the author of the article is that under the influence of digitalisation, some of the traditional competencies of managers lose their relevance, while there is a need for new digital competencies.

The article can be useful for senior management, top managers and practitioners interested in the development and application of modern methods of company management, taking into account professional competencies that allow quick response to changes both outside and inside the company under the influence of digitalization.

METHODS

The methodological and theoretical basis of the study conducted by the author were the concepts of sociologists and economists in the field of management theory, transformation processes in the context of globalisation; principles of the systemic approach, structural and functional

analysis, general scientific methods of cognition (comparative analysis, description, classification, modelling, etc.); developments of modern Ukrainian and foreign scholars in the field of management, human resource management, sociology of management, competence approach.

The article analyses current research on the topic and monitors publications related to digital transformation in management in the current business environment. The theoretical basis of the work is formed by the works of well-known foreign and Ukrainian scholars in the field of economic theory, management theory, systems theory, economic psychology and management psychology, analysis of socio-economic aspects of management, study of the phenomenon of leadership in organisations, patterns of development and functioning of the information economy, peculiarities of organisation and management of virtual and network organisations.

In conducting the study, the author used a combination of methods that contribute to solving the tasks set, such as: the method of synthesis (collection and generalisation of information), comparative and analytical method (comparative analysis), and systematisation of materials (systematic approach).

The methodological basis of the presented research is the conceptual provisions of the digital economy. The author of the article considers the transformational aspects of management and leadership in the new technological order, identifying the impact of digitalisation on the transformation of modern management on the basis of a systematic approach as a field of activity aimed at accumulating knowledge and skills in the use of digital technologies to improve the organisation's management process.

The article uses the methods of analysis and synthesis to consider the concept of management in the context of digitalisation, to analyse the views of scientists and the business community on the problems and prospects of digitalisation of management, and to provide statistical examples characterising the role of digital technologies for managing an organisation in the context of sustainable development and functioning of the digital economy. The author's position on the views on the challenges and opportunities of modern managers was formed using such methods as content analysis, conceptual content analysis, decomposition of entities, comparative analysis, deduction, logical generalisation, graphical and tabular methods. The author processed and interpreted the data using the methods of grouping, typology, and classification.

In the process of researching, analysing and systematising the information obtained, the author used general scientific methods of cognition: collection and processing of information, analysis of existing literature on the analysed issues, comparison and analogy, generalisation, logical methods, and the method of information retrieval. Using observation and the method of expert assessments, the article identifies general trends in development and modern management and challenges for managers on the path to sustainable development.

The study uses quantitative and qualitative analysis methods. To argue his own point of view, the author of the article cross-applied various methods of analysis, which allow to test the hypothesis and substantiate the author's position. Due to the long period of scientific discussion, high journalistic activity and relevance of the topic presented, the author analysed the interest of the scientific community in management theory, digital leadership and modern human resource management of organisations.

The methodological procedures of structural and functional analysis and the principle of systematicity allowed to identify the essential features of globalisation that have the greatest impact on the formation of competencies of an organisation's manager. When studying the processes of forming professional competences of managers and digital leaders of modern organisations, the author of the article also used socio-psychological and axiological approaches. To determine the necessary competences of a modern manager-leader, the author used an activity-based approach.

The information base of the study was formed by research projects conducted by reputable agencies and organisations in the field of information economy, as well as reports, information and reference materials of rating agencies and publications of scientists, researchers and specialists, including the proceedings of international conferences, periodicals, and Internet materials that are freely available.

RESULTS

Modern technologies exert a large-scale influence on the transformation of management functions, management tools and methods,

managers' competencies, actualizing the question of how companies will be managed in the near future. The author presents an overview of the directions of management development with an emphasis on the contours of the management paradigm of the digital era. An important management trend has been identified, when digital leaders and talented managers who make decisions based on common sense, rational experience and systemic thinking, aimed at the use of knowledge and information Based on the results of the research, the author concluded about the need to develop digital competencies and managerial competence of managers.

The results of the study can be used in the practice of organisational management to make management decisions focused on the use of digital technologies in various areas of management activities; will help to increase the efficiency of management in the context of the rapid development of digital technologies and ensure the competitiveness of organisations in the modern economy. The trends in the development of modern management, as well as new competencies of managers identified as a result of the analysis, are of interest to researchers and management practitioners, although they require further analysis as technologies and management practices develop.

A management system is a set of policies, processes and procedures used by enterprises to solve various problems and achieve goals. Based on the assumption that managerial innovation is a change in the organisation of the management process, its functions, technologies, as well as methods of work of the management apparatus, it is through the application of managerial competence and the use of new information technologies that any innovations can be implemented (Svinarova, 2020). According to N.P. Reznik (2019), a management system can be considered effective when it allows a company to skilfully adapt to changes in the external landscape, promptly identify potential risks and capitalise on profitable prospects.

Sedikova I. O., Sedikov D. V. (2022) and Baranov V. V. (2021) believe that it is digital technologies that make fundamental changes to the formation and development of a new management paradigm. These technologies create the conditions for transferring work and life to the virtual world, which leads to the emergence of cyber production, cyber systems, cyber machines and the movement of "innovation centres" from large companies to small start-ups. Therefore, it is very important not only to install modern equipment and software, but also to develop effective management systems to ensure the success of enterprises (Boyda, 2022).

The rapidly changing business environment, driven by global changes in geopolitics, the economy, and the accelerating pace of digital technologies, requires the organisation's management to be more adaptable, flexible, and responsive. In this regard, the concept of management 4.0 is being formed and developed, combining advanced strategies, innovative approaches and the use of modern information and communication technologies. In the studies of J. M. Muller, D. Kiel and K.-I. Vojta emphasizes that the Fourth Industrial Revolution changes not only industrial production, but also economic, environmental and social aspects that are important for the sustainable development of society (Müller et al., 2018). According to J. Olakh and his colleagues, organizational strategies in the context of sustainable development form the basis for the implementation of Industry 4.0 technologies (Oláh et al., 2020).

The most significant areas of transformation related to Management 4.0 are presented in Table 1.

Table 1: The most significant areas of transformation related to Management 4.0

Directions.	Changes
Technologies	Integration of new and application of existing technologies related to artificial intelligence, big data analysis, and machine learning.
Organisation of work	Building more flexible workflows that are innovative, adaptable, and meet the expectations of employees and customers.
Business models	Use of advanced dynamic approaches based on the digital economy to the formation of business models that are accessible to managers of different levels.

Leadership	There is a need for flexible company development strategies, and even changes in its structure to support digital transformation.
Continuous professional development	Increased importance of advanced training and retraining programmes to develop digital thinking and new skills among managers and employees.

Source: compiled from (Haleem et al., 2023).

The process of introducing digital innovations and transforming management systems is a multifaceted activity that requires careful planning, organisation and a holistic approach, taking into account many factors (Lozovsky & Gusak, 2019). However, in the age of digitalisation, when efficiency and speed are paramount, this process can become the basis for a company's success and ensure its competitiveness in the future.

In a study by the BCG company (Hemerling et al., 2015), modern conditions are called the era of constant transformations. Changes that require detailed consideration and immediate management response occur on an ongoing basis. One of these challenges is the transition to the digital economy. Digitization of business processes significantly accelerates the processes of decentralization of management. The increase in the qualifications of employees and the decrease in the volume of routine operations determines the nature of management at the new stage (Müllera & Hopfa, 2017).

It is important to understand that the concept of digital management is all about management. First, it is necessary to improve the management system, enhance the quality of leadership potential, and only then implement digital management technologies. Without this, managerial backwardness (inefficient type of organisational structure, imperfect systems of incentives and motivation of employees, etc.) (Appelo, 2019).

The Allianz Risk Barometer 2022 is an annual report that explores the most important risks to businesses and economies around the world. According to the report, the biggest risks for businesses in Europe in 2022 were: cyber attacks and cyber crime, business loss or interruption, environmental and climate risks, the COVID-19 pandemic and its consequences, and political risks. Among the changes that have occurred compared to 2021 are the increase in the threat of environmental damage and climate risks (from 6th and 8th place to 3rd and 4th place) and the emergence of a new risk, such as the shortage of qualified personnel and labour, which was noted by 13% of respondents out of 2,650 expert respondents (Allianz Risk Barometer, 2022). The existence of these risks forces managers to effectively cope with them and develop appropriate strategies.

In recent years, artificial intelligence has gained widespread popularity and has been used in various fields of activity. Its use has many benefits for optimising work in organisations, but on the other hand, it can also have negative consequences.

Artificial intelligence can be described as "the ability of a system to correctly identify external data, obtain certain information from such data, and use it to achieve specific goals and objectives through flexible adaptation" (Kaplan & Haenlein, 2019). At the same time, it should be noted that research related to the interaction between artificial intelligence and strategic management does not have a consistent structure and terminology due to its interdisciplinary nature (Duan et al., 2019).

AI-based systems are becoming more efficient thanks to recent technological advances that are less expensive and often used to solve business problems (Gunasekaran et al., 2017; Lee, 2018; Davenport & Ronanki, 2018).

It is expected that businesses will continue to move towards artificial intelligence to replace humans with automated systems, thereby improving business operations and reducing financial costs (Yefremov & Boyko, 2023, p. 9).

It is assumed that the use of artificial intelligence will allow solving tasks that usually require human intelligence (Mitchell, 2019). In academic circles, this has sparked a debate about the future validity of traditional organisational assumptions about increasing or replacing managers (humans) with intelligent machines (Huang et al., 2019). The quality of decisions is improved when decision makers have some knowledge of the relationships between problem variables. This allows artificial intelligence to

become a new source of knowledge, allowing the development of new models of management decision-making and organisational culture (Barro & Davenport, 2019).

Artificial intelligence is rapidly becoming a key tool for modern managers. It not only automates everyday tasks but also analyses huge amounts of data to help make informed decisions. The main areas of application of artificial intelligence in management are:

- Automation of business processes. Artificial intelligence can perform many routine tasks, such as order processing, inventory management, and production planning. This allows managers to focus on the strategic and creative aspects of their work.

- Data analysis. Artificial intelligence is capable of processing large amounts of information and identifying hidden patterns. This enables managers to make decisions based on data rather than intuition.

- Forecasting and planning. AI helps to predict demand, plan production, and allocate resources, allowing managers to anticipate and prevent potential problems.

Managers, employees, and developers of AI systems need to think about what advantages and disadvantages will be brought to management by the use of this digital tool.

Numerous researchers highlighted the potential of artificial intelligence in management decision-making processes and showed its positive impact on the individual level of managers' effectiveness (Bettis, 2017; Wilson & Daugherty, 2018).

We believe that the main advantages of applying and using artificial intelligence in management are:

- increase in efficiency. Automating routine tasks with artificial intelligence significantly increases the overall productivity of managers;

- improving the quality of decisions made. Thanks to data analysis and

forecasting, managers can make more informed and effective management decisions;

- Risk mitigation. Forecasting and planning using artificial intelligence technologies help reduce the likelihood of problems and crises.

However, like any modern technology, systems based on artificial intelligence have a number of drawbacks.

Among the disadvantages is the risk of job losses. If robots begin to replace humans in every field of activity, this could lead to job losses and increased unemployment. In addition, human mental abilities will decrease, as there will be less need to use out-of-the-box thinking and adaptation to multitasking. However, this risk is offset by the creation of additional jobs for specialists capable of working with artificial intelligence systems, deciphering data and monitoring the systems' operation. According to statistics, almost 100 million jobs will be created in the field of artificial intelligence by 2025.

Although artificial intelligence capabilities are increasingly capable of replacing humans in monotonous tasks, it is unlikely that there is a substitute for creative solutions and social behaviour. Modern artificial intelligence is not yet capable of processing intellectual thinking and communication in the same way as humans).

Another risk factor when implementing artificial intelligence for organisational management is data security and privacy issues. Computer systems process data, including personal information about users, and if this information falls into the hands of intruders, it can lead to serious consequences.

Understanding that the above problems are only the tip of the iceberg of management challenges, let's look at this issue from all sides (Figure 1).

3.1. Personnel changes caused by the introduction of artificial intelligence

The era of active automation and informatisation of business processes has been going on for 40 years. On the one hand, managers do not have to adapt to changes in staff and their functional responsibilities caused by the digitalisation of business processes. However, artificial intelligence affects staffing on a different level. If the automation of regularly repeated procedures or business processes influenced the transition of people to higher-level work, from the manual work that dominated the industrial 20th century to more intellectual work, the spread of artificial intelligence has significantly affected the distribution of positions at this level. People will be forced to perform more complex roles in society and move towards the analysis of intellectual roles that characterises strategy and management work in a globalised society.

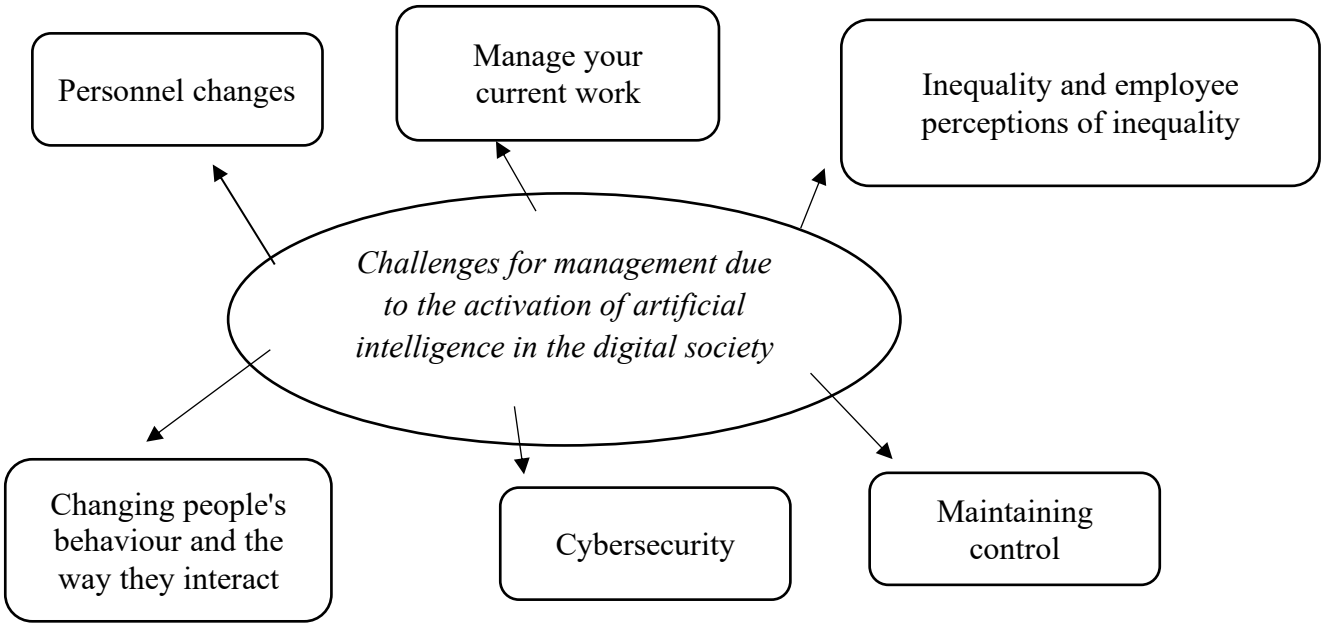

Fig. 1. Challenges for management due to the increased use of artificial intelligence in the digital society
Source: compiled from (Doroshkevych & Lytvynenko, 2022).

McKinsey & Company conducted a study in 46 countries, covering more than 800 professions. According to the study, the total number of professionals who may lose their jobs due to the introduction of artificial intelligence is 800 million by 2030. This means that one in five people currently employed will lose their jobs, not to mention how many will reorient their professional activities to keep their jobs. Solving HR issues and the many problems associated with deciding which business processes should be automated using artificial intelligence will be one of the main tasks of modern managers.

3.2. Management of current work

Artificial intelligence will replace certain jobs, resulting in certain work tasks being performed continuously or with little or no downtime. Accordingly, the management of these processes will also have to be constant, which will lead to an overload of managers. Take self-driving trucks, for example, a project already underway at Tesla, Volvo, and Mercedes-Benz. Self-driving trucks are an example of artificial intelligence that serves many tasks simultaneously:

- Ethical - to reduce the number of accidents and reduce the risk of their occurrence;
- Personnel - to eliminate the human factor (driver) from the process of transporting goods;
- The business objective is to increase the freight carrier's revenue by increasing the volume of cargo transported by increasing the number and duration of flights.

An increase in the number of trips made by self-driving trucks will lead to an increase in the number of miles travelled and the number of deliveries made. This naturally means an increase in logistical workload and more uninterrupted working hours for managers who manage the process. In turn, the high workload of support staff will lead to the need to create new means of motivation and increase the requirements for stress resistance and information processing speed of employees. The next step will be to use artificial intelligence to automate this business process and return to the first call.

3.3. Inequality and employees' perception of inequality

People who work hard will get a lot. This statement is the basis of a market economy. The amount of work an employee does directly or indirectly depends on the number of hours they work. In addition, when calculating the cost component, companies focus on the level of salary to be paid. However, with artificial intelligence, the need for human labour will decrease, which means that the wage component will decrease, and company profits will increase. Therefore, owners of companies that actively

implement AI technologies will receive more income in the future. For example, according to Forbes (The Richest People in the World, 2021), the richest man in the world is Jeff Bezos, the founder of Amazon, and the growth of his company is directly related to the active use of artificial intelligence in the search tools of the world's largest online retailer. An additional analysis of the top 30 companies in this ranking shows that 19 of them actively and openly use AI technologies in their business. As a result, the income gap is widening. Disclosure of information about the income of company owners and shareholders has become a serious problem for the company's management. In addition, employees can independently assess the difference in income between hired experts and their own earnings. The issues of fairness and proper motivation come to the fore.

3.4. Changes in human behaviour and interaction under the influence of artificial intelligence

Initially, AI developers were tasked with creating systems that could effectively communicate with people in the B2C sector. As a result, modern CRM systems responsible for managing customer relationships rely heavily on bots, automated responses, and artificial intelligence. This change has undoubtedly affected the way companies communicate with their customers. The nature of this communication differs from that of a human consultant, which in turn affects the level of customer loyalty and can potentially lead to negative results. Developers, on the contrary, are aware of this pattern and create artificial intelligence that closely resembles a real person. As a result, in 2015, the Turing test was successfully modelled for the very first time. This information is attributed to the intellectual Eugene Gustman.

In conversations with Eugene, most people who talked to him believed that he was a real person. This event marked an important milestone in the development of artificial intelligence. It is proof that the development of artificial intelligence is advancing so quickly for sales and service by treating them as people. At the same time, as computerisation continues to expand, humans will face limitations in their ability to pay attention and communicate, while AI-powered bots will have virtually unlimited resources at their disposal to develop relationships, including promoting loyalty and facilitating product sales. The optimisation momentum is growing steadily. Digital advertising is following the practice of optimising ad headlines based on user queries, A/B testing and content algorithmisation. In the midst of this trend, we can discuss the issue of technological dependence, which has the ability to capture the attention of the consumer.

3.5. Safe artificial intelligence

The importance of creating a secure information environment has always been emphasised, and the integration of artificial intelligence is no different. As AI technology grows in power, cybersecurity becomes paramount, requiring a greater allocation of resources to ensure its safe use. A pressing concern is the potential consequences if artificial intelligence becomes hostile to humanity. We are not discussing catastrophic scientific predictions, but rather the responsible use of AI technology to achieve desired goals, as it can lead to unpredictable results. Artificial intelligence has the ability to develop and acquire knowledge autonomously, meaning it can propose and implement innovative solutions that can significantly impact business operations and communication. The focus of companies can be divided between customers and the technological processes they use. It is important to emphasise that artificial intelligence has no feelings and does not understand where the boundaries of tasks are. This can be a real challenge for managers.

3.6. Maintaining control over a complex intelligent system

Control over a complex intelligent system is an important aspect of its safety. Creating artificial intelligence involves programming, training, and testing. During training, the system learns to identify the correct patterns of action and act in accordance with them. Testing involves obtaining many examples, which allows you to track the work of artificial intelligence. Artificial intelligence must also respond to the unusual situations that arise in life. That's why it's important to control artificial intelligence according to a specific plan and code.

Given that this management function is the easiest to automate, it is reasonable to realise that full automation of related business processes is not advisable. Perhaps a situation where we simply "unplug" artificial intelligence will be impossible, as this technology can foresee and

protect itself. Thus, a modern manager should not only control the development of artificial intelligence, but also predict the vector of its development.

Thus, the development of artificial intelligence opens up new opportunities for managers to increase efficiency, improve the quality of decisions and reduce risks. However, to realise this potential, it is necessary to overcome existing challenges and develop effective strategies and policies.

The challenges associated with the introduction of artificial intelligence include:

- The need to adapt. Managers will have to master new technologies and integrate them into their own work processes. Artificial intelligence can become independent and get out of control, which raises important issues

issues of confidentiality, fairness and responsibility.

In summary, artificial intelligence is a powerful tool that can significantly improve the work of managers. However, its successful implementation requires a balanced approach and consideration of possible risks and ethical issues.

Exploring the dynamics of business and management transformation, I. Moré emphasises the relationship between technological progress and organisational change: "the digital revolution will not be able to reach its full potential unless companies adopt a new approach to management. This involves replacing rigid organisational structures with flexible and dynamic systems that encourage employee autonomy and initiative. In this new paradigm, managers take on the role of facilitators, fostering a sense of independence among employees while aligning their actions with the overall strategic framework" (Porter & Happelmann, 2014).

Integral characteristics of the enterprises of the future are the ability to radically change business models, while maintaining social responsibility, which turns into a philosophy. It also includes a commitment to continuous innovation, the creation of a value proposition that exceeds consumer expectations, a readiness for global integration and a change in management behavior for the benefit of society (Global CEO Study: The Enterprise of the Future, n.d.).

Adapting traditional leadership practices to a technologically mediated environment is more challenging. This is primarily because the basic skills traditionally associated with leadership, such as communication skills, which are necessary to unite and motivate others to achieve common goals, are largely modified by the use of electronic communication technology. Communication and relationship building take on a different level of complexity when employees are dispersed across multiple time zones and different cultures (Flood, 2019, p. 3). This trend requires new leadership skills.

In recent decades, leadership research has focused on defining the role and types of leadership in the context of the digital economy. As a result, a new concept has emerged – "digital leaders". The concept of a "digital leader" in the annual Global Human Capital Trends report by Deloitte, which characterises and sets trends in the field of human resources management of modern organisations, in 2017, in the section on digital leadership (Leadership disrupted…, n.d.), was defined as a leader who is able to build teams, maintain people's involvement and communication, and develop a culture of innovation, risk tolerance and continuous improvement. The competencies that can be used to define digital leadership are presented in Table 2.

Table 2: Competencies of a digital leader

Competence	Contents
Communication skills (E-communication)	The leader is able to communicate using ICT in a clear and organised manner that avoids errors and misunderstandings and does not hinder productivity
Social skills (E-social)	The leader has the ability to create a positive work environment and improve communication and collaboration through various virtual communication methods.
Skills. team building (E-team)	A leader has the ability to build, motivate, recognise and hold teams accountable in a virtual environment.

Creation skills trust (E-trust)	When using ICT, a leader has the ability to evoke trust, he is perceived as honest, consistent and fair
Skills. transformation (E-change)	The leader has the ability to effectively lead change and transformation initiatives using ICT
Technological skills (E-tech)	The leader is technologically savvy and stays abreast of relevant ICT developments and ICT security issues

Source: compiled from (Roman et al., 2019)

Digital leadership is one of the most important trends of our time, not only because of the enormous technical changes, but also because it facilitates (or hinders) other trends, such as the growth of many remote leadership practices (Liu et al., 2020). The comparative characteristics of leadership are shown in Table 3.

Table 3: Comparative characteristics of leadership

Features	Formal leadership	Informal leadership	Digital leadership
Authority	Based on position and formal authority	Based on personal qualities and peer recognition	Based on knowledge, expertise and the ability to innovate
Structure	Strict and hierarchical	Flexible and informal	Flexible and open, often without explicit hierarchies
Communications	Formal, often through official communication channels	Informal, often personal and confidential	Often digital, through electronic platforms and social media
Decision-making	Often centralised, based on a hierarchy of power	Decentralised, often collegial	Decentralised, data-driven and collective intelligence
Adaptability	Limited, often slow to change	Promotes rapid response and adaptation	High, active adaptation to new technologies and trends
Innovations	Often hampered by formal procedures and restrictions	Fosters innovation through freedom and openness	Strives to innovate through the active use of technology
Digital literacy	Low, often limited by traditional working methods	Can be varied, depending on the use of digital tools	High, active use of digital technology to improve productivity and efficiency

Source: compiled by the author

The development of the economy of any country today largely depends on the readiness of organizations for digital transformation. A special role in the digital transformation of the real sector of the economy is played by the training of management personnel and the actualization of competencies. According to studies by Deloitte (2016) and McKinsey (Bughin et al., 2018), all over the world, company leaders were not ready for digital transformation, as only 8% of existing business models could remain economically viable taking into account the transition to digitalization. At the same time, a joint study by Development Dimensions International, the Conference Board and Ernst & Young Global Limited showed that on average only 11% of leaders in Europe (compared to 22% globally) believe that they have sufficient levels of digital competencies of their management staff

(Development Dimensions International, Conference Board и Ernst & Young Global Limited, 2018).

In the context of digital transformation, just as in the traditional operating environment of any business, it is important that the organisation is managed by managers who are leaders. In the era of digital transformation, the essence of leadership is to fully utilise the existing capabilities of employees, consciously manage the organisation and overcome external circumstances in work and personal life. Therefore, the purpose of management is to ensure the rational use of human resources management, that is, the use of available time for productive and successful activities or the use of as little time as possible to achieve the set goals (Temchenko & Bondar, 2020, p.112).

With effective leaders in the organisation, information technology can be implemented in a quality manner that not only does not harm production or intellectual processes, but also helps to increase employee productivity, improve the working atmosphere and positively affects relations with employees. In addition to professional knowledge and skills, the moral and psychological qualities of modern managers are particularly important, namely: "high life ideals, honesty and integrity, justice and objectivity, wisdom, tact, tolerance, decency and modesty, self-criticism, kindness, sensitivity to people and humanity" (Polyanska et al., n.d.).

I.V. Oliynyk (2023) rightly believes that modern leaders should possess such a personal trait as well-developed emotional intelligence, as it "includes empathy, the ability to understand and sympathise with others. Leaders with these skills demonstrate empathy, actively listen to employees' complaints and show genuine care and support. This helps to build positive relationships, improves communication and promotes cooperation in the work environment".

It should be noted that digital leadership is becoming particularly relevant in connection with the transition to a virtual work environment in the context of the growing prevalence of various forms of remote employment. Remote work has a number of potential benefits. Empirical studies have shown favourable results of the impact of remote work on such aspects of labour activity as productivity, job satisfaction, less work-family imbalance, reduced stress and lower staff turnover (Brunelle & Fortin, 2021; Nakrošiene et al., 2019). On the other hand, digital leadership is one of the main factors that contribute to achieving a higher level of employee engagement (Busse & Weidner, 2020).

Digital leadership is defined as "the effective use and combination of electronic and traditional methods of communication. This implies awareness of existing and relevant ICTs, selective adoption of new ICTs for oneself and the organisation, the ability to choose from a variety of traditional and electronic methods to effectively achieve various goals, and technical competence in the use of selected ICTs" (Van Wart et al., 2019, p. 83). Accordingly, a digital leader is a leader who works according to the principles of the fourth industrial order - leader 4.0. Thus, in the digital environment, the focus is on recognising leaders who can easily adapt to the digital sphere and use new technologies to achieve goals. Instead of following the traditional model where one leader takes full control of decision-making and overall management, a new model is emerging that distributes management and accountability among team members. This approach allows an organisation to tap into the collective knowledge and experience of all its members, fostering a more adaptive and resourceful approach to solving problems and succeeding in the digital economy (Leadership Mindsets for the New Economy, n.d.).

From the author's point of view, a "digital leader" is:

- a high-tech leader who is familiar with constantly changing digital technologies, has a high readiness for risk and innovation, continuous change and self-development, has interdisciplinary skills, knows how to build teams and engage people, lead teams, maintain communication and cooperation;
- a leading (for a certain period of time) member of the agile team who has digital competencies, supports team member engagement and communication, has a positive transformative impact on the team's activities, develops a culture of innovation, manages change and is accountable for the team's actions.

The digital economy is placing new demands on leadership skills, such as the ability to analyse data, make data-driven decisions, manage change and drive innovation. Leaders need to continuously develop their own

competencies to lead successfully in the digital environment.

Leadership 4.0 is primarily about working with the community, teamwork, human relationships, quickly forming flexible teams for tasks and redistributing working group members according to the situation, recognising the value of each team member and the sustainability of changes.

The new concept of the digital economy emphasizes digital management, which is based on the development of intellectual capital (Holford, 2019).

In general, the digital economy requires leaders to be flexible, adaptable and innovative. They must be prepared for constant change and be leaders in the development and application of new digital technologies to achieve their organisation's strategic goals (Table 4).

Table 4. Requirements of the digital economy for modern leaders

Requirements of the digital economy	Qualities of modern leaders
Adaptability and flexibility	Digital leaders must be prepared to adapt to ever-changing technology trends and market conditions. They must be flexible in their thinking and actions, able to respond quickly to new challenges and opportunities presented by digital transformation.
Ability to make decisions based on data	Data is increasingly becoming a key resource for strategic decision-making in the digital economy. Digital leaders must have data analytics skills and the ability to extract valuable insights from large amounts of data to make informed decisions.
Innovative thinking	Digital leaders must be open to innovation and constantly look for new ways to improve the business using digital technologies. They should foster creativity and initiative within their own team, encouraging the development of new ideas and solutions
Digital literacy	Digital leaders must have a basic knowledge of modern digital technologies and tools. They must understand the principles of digital platforms, mobile applications, cloud services, and the basics of cybersecurity.
Communication and change management skills	Digital leaders need to have excellent communication skills to effectively engage with different business stakeholders and motivate them to change. They also need to be able to drive change across the organisation to successfully implement digital strategies and processes.
Strategic thinking	Digital leaders need to have a clear vision of their company's digital transformation and the ability to develop strategies to implement it. They must be able to set priorities, build long-term plans and adapt them to changing market conditions.

Source: compiled by the author

We believe that digital leaders with these competencies are able to effectively manage a company in the digital economy and ensure its successful development in the long term. We also note that digital leadership requires continuous development and improvement of skills for successful management in a rapidly changing digital environment. On January 17, 2018, the updated edition of key competences for lifelong learning was approved - recommendation 2018/0008 (NLE) of the European Parliament and the Council (EU) (Council Recommendation on Key Competences for Lifelong Learning, n.d.). The list and names of key competencies, in comparison with the previous edition, have been updated, but digital competence is present among them in both the old and new editions. Next, we will consider strategies and approaches that will help leaders develop their own digital competencies and effectively manage digital transformation in their own organisation (Table 5).

The ever-changing geopolitical landscape poses a major challenge to managing in an unstable and uncertain world. Economic crises, political conflicts, changes in laws and other global events can cause instability in markets, which can affect business operations. In recent years, the risks associated with changes in international relations, the spread of economic and trade sanctions, and direct military conflicts have increased (Rudyka, 2021). In order to adapt to geopolitical changes, businesses need to create adaptive plans that will allow them to respond quickly to changes in the external environment.

Responsible leaders should be flexible and actively use "their tendency to solve complex situations at the highest level" (Schraa-Liu & Trompenaars, 2021, p. 314-331). This raises the question of what are the prerequisites for the emergence of new models of leadership in the global environment, and which of them are related to responsible leadership for sustainable development.

Table 5. Approaches to the development of digital competences of modern leaders

Approach.	Rationale
Education and self-education	Leaders should invest time and effort in digital and innovation education. This can include participating in specialised courses, trainings, webinars, conferences and seminars. It is also important to study the literature, online resources and practical materials on digital technologies on your own.
Developing data analysis and technology skills	Leaders must actively develop their own data and analytics skills. This includes mastering data analysis tools such as Excel, Python, R and SQL, as well as understanding machine learning and artificial intelligence techniques. Leaders should also keep up to date with the latest technology trends and innovations in their field
Participation in digital transformation projects	Leaders should be actively involved in digital transformation projects within their own organisation. This will allow them to gain hands-on experience with digital technologies and processes, as well as a better understanding of the needs and challenges faced by employees and customers.
Development of communication and change management skills	Leaders must continually improve their own communication and change management skills. This includes developing effective communication skills, the ability to inspire and motivate a team, and the ability to manage conflict and solve problems.
Continuous self-improvement and feedback	Leaders must constantly strive to improve themselves and be open to feedback. They must actively seek opportunities to improve their skills and competencies, and be willing to admit their mistakes and learn from them.
Networking and exchange of experience	Leaders should actively participate in professional communities, networking events, and exchange experiences with colleagues from other companies and industries. This will help them learn about best practices and innovations, share experiences, and receive support and inspiration from other digital leaders.

Source: compiled by the author

DISCUSSION

Globalisation is helping to make the world visually smaller and more connected, removing barriers to doing business. Technologies, ideas, information and people are becoming very active. This creates a prerequisite for future leaders to be global citizens, able to successfully attract and retain talent from different parts of the country and around the world, and to coordinate the work of employees to achieve common goals. The job of a leader is not only to have diverse teams and well-rounded employees, but also to create a sense of belonging for each employee. This is the nature of future inclusivity.

An analysis of the World Economic Forum's work on the global agenda

demonstrates that a key quality of strong leadership is a "global perspective", which is a key skill for strong leaders. Priority skills should also include collaboration, communication, and global thinking skills, and having these skills allows the modern leader to see cultural and geographical diversity as opportunities, not just "challenges". A study conducted by Thunderbird Academy shows that more than 200 global leaders and 6,000 managers describe global thinking as a set of personal qualities that are critical for future leaders (The World Economic Forum…, 2023). In addition, socially responsible management and leadership come to the fore when companies take anti-crisis measures. This allows them to retain their own team and continue to implement the mission, goals and strategy of the business (Dzhur et al., 2023, p. 2).

Responsible leadership for sustainable development differs from global leadership in its emphasis on personal leadership growth. This means that people explore their own values, goals and visions, and identify their own strengths as leaders. In addition, responsible leadership involves understanding the challenges and demands of this type of leadership, developing a unique leadership approach, and being willing to take real action to lead responsibly. The achievements and skills gained through personal leadership development can then be used to benefit the organisation and create positive social change. Responsible leaders play a crucial role in shaping organisational and institutional structures, introducing new technologies and innovations, and engaging a wider range of stakeholders. The guiding principles of responsible leadership include community building, self-respect and respect for others, service, justice, trust and integrity.

CONCLUSIONS

The author's research allows us to draw the following conclusions:

- in the context of the formation of the digital economy, the evolution of social and labour relations, the role of the modern manager is significantly changing, who needs to take into account both positive and negative challenges of the digital economy. The author describes the main trends in the transformation of social life and economic activity in the digital economy, which pose much more complex challenges to management systems of different levels and, accordingly, require a revision of management models and management approaches, including approaches to leadership and management of organisations;
- The management profession not only remains relevant in the digitalised economy, but is also becoming more in demand due to new challenges and opportunities;
- Artificial intelligence is a powerful tool that can significantly improve the work of managers. However, its successful implementation requires a balanced approach and consideration of possible risks and ethical issues.
- in the digital economy, both leadership models and leadership requirements are changing. Based on the systematisation of the results of research on leadership in the context of digital transformation, the author compiles a list of the main personal qualities, skills and abilities required by a leader in the digital economy to ensure the survival of the organisation and achieve success; most of them are new to leaders, are due to the specifics of the functioning of organisations in the digital economy and reflect the challenges, complexities and opportunities inherent in digital transformation, which determines the need to find ways to develop the necessary qualities and skills.
- Managers who are able to adapt to new conditions and effectively master digital tools will play a key role in successful business transformation and change management in the future.

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