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Digital Transformation and Cognitive Challenges in Project Management: Navigating Crises in the Information Society

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Abstract: Cognitive challenges and decision-making complexity are intensifying in the digital era, particularly within project management frameworks affected by systemic crises such as the COVID-19 pandemic. This study explores how digital technologies reshape project management by influencing information processing, coordination, and governance models in both the private and public sectors. Drawing on empirical evidence from Ukrainian public institutions and SMEs, the article identifies the uneven pace of digital adoption and the structural, ethical, and informational asymmetries that hinder optimal implementation. The study highlights how big data, intelligent analytics, and emerging AI applications—particularly neural computing and machine learning—introduce new paradigms of cognitive processing, configuration management, and value generation across the project lifecycle. It also addresses infrastructural and organisational obstacles, such as digital inequality, information overload, and the need for adaptive decision models. Special attention is given to public administration, where digital tools must balance democratic inclusivity with system efficiency. The findings underscore the dual role of digital technologies as both enablers and disruptors of traditional management logic, requiring a fundamental reconceptualisation of how information is structured, evaluated, and acted upon in dynamic environments.

Keywords: digital transformation; project management; public administration; information society; digital technologies; information asymmetry; digital divide; big data; Covid 19; decision-making.

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1. Introduction

The information society, replacing the industrial one, has dramatically changed the methods and ways of thinking in all spheres of economic, social and private life. The modern trend and the necessity of time for the functioning of management technologies in a variable dynamic environment lie in the formation of an information space and the use of digital technologies.

Project management, as an activity aimed at project implementation and goal achievement, has as its main task the optimal use of all resources, taking into account challenges and constraints. Public management faces the challenges of transparency of decision-making and proving its effectiveness in combination with the rational use of all resources.

The main hypothesis of the study is the statement that the combination of principles of project management and modern digital technologies allows for the formation of a methodology for cost optimisation and achieving project efficiency. The traditional management paradigm at all levels is changing to an informational one, where managers are required to change the management philosophy and project approach. Adaptive and design approaches to management decisions give a synergistic effect when using digital technologies.

The research methodology consists in using a historical, statistical, and comparative approach to analyse the real state of the use of digital technologies in the project management of public authorities in Ukraine. To identify the prospects and threats of digitalisation in project management, methods of abstraction, elimination and observation were applied, and the substantiation of conclusions and recommendations was based on a systematic approach, taking into account the impact of crises and pandemic situations on the long-term prospects of transformation of management principles and methods.

The research involved a systematic review of relevant scientific sources, available in such databases as *IEEE Explore*, *Web of Science*, *ScienceDirect*, *SpringerLink* and *Google Scholar*, to study the “human – management – digital technology” triad. It allowed the authors of the article to confirm the hypothesis about the impact of digital technology on project management, especially in the conditions of the “new reality” formed in the times of COVID.

The next stage of the research was to assess the availability and effectiveness of digital strategies in economic agents, taking into account cost constraints. It became possible due to the information obtained by interviewing and surveying managers of small and medium-sized businesses in Ukraine, as well as project managers in public management. The analysis of their answers proves the unevenness of the digitisation process and identifies the challenges associated with the use of digital technologies in project management.

In a post-industrial society, where information and knowledge become the main productive force, the traditional paradigm of management in general changes, as well as project management in particular. It is traditionally recognised that project managers must control their employees in their work on projects. The situation changes in a context of dynamic change and crisis situations (McDonald, 2011; Nerubasska, Palshkov, & Maksymchuk, 2020; Nerubasska & Maksymchuk, 2020; Onishchuk et al., 2020). The global COVID-19 pandemic has changed the way we look at work and management, virtual work has become commonplace, and projects are taking place in the digital world. As early as the last century, Handy (1995) raised the issue of managing virtual organisations by describing virtual teams, flexible work schedules, and the economic transformation of work. Digital technologies have become a necessity in the implementation of projects, and their constant transformation and development force managers to innovate and be creative in deciding on the use of digital technologies.

A surprising number of companies and leaders underestimate the growing momentum of digitalisation, the behavioural changes and technologies that are driving them, and the scale of the distortions in the digital landscape. Many companies are still trapped in a strategy process that is tied to annual cycles. Only 8% of companies say their current business model will be economically viable if digitalisation in their industry continues at its current pace.

The Centre for Digital Business at MIT and Capgemini Consulting have proposed defining digital transformation as the use of new digital technologies (social media, mobile, analytics, or embedded devices) to deliver large-scale business improvements in multiple areas, such as improving customer service, streamlining operations, or creating new business models. A little later, researchers say that digital transformation is the reorganisation or investment in new technologies, business models, and processes to increase value for customers and employees, competing more effectively in the ever-changing digital economy. The research problem of this work is how traditional companies, together with digital ones, can use new technologies to build an effective digital strategy in a dynamic, competitive environment.

Seetharaman's research (2020) on changing business models under the influence of COVID-19 marks a strategic breakthrough in the development of digital technologies, and their application in management contributes to the use of all the capabilities and potential of the team. The impact of the pandemic on the growth of digital technology is being studied by De, Pandey, & Pal (2020), who describe work practices and human interactions in the context of privacy, security, and governance. Problems and prospects for the large-scale implementation of digital technologies in management are described by Sein (2020), who analysed the use of digital technologies during a pandemic.

Our research, based on these works, shows how digital technologies are changing the philosophy and practice of project management in terms of perception and understanding of information, new management techniques, and threats associated with changes in business processes and management practices.

The Internet of Things, data science, deep learning, and augmented reality bring new opportunities, challenges, and solutions for many areas, including project management. These technologies are the centre of the information revolution, but whether organisations are ready for large-scale changes and how to adapt to rapidly changing operating conditions, the question remains unanswered and needs to be studied.

Digitalisation, as an innovative technology in project management, becomes a necessity, avoids critical disruptions in managed processes, enables optimisation of productivity and quality, and achieves the necessary flexibility in Industry 4.0. The need for digital transformation in project management is not in doubt, but this process requires the search for innovative solutions and effective practices in the use of advanced technologies that will help create new value in project lifecycle management. However, there is a need to identify, evaluate, and eliminate the negative aspects of digitalisation in project management processes, including maintenance complexities, information asymmetry, digital divide, high cost of information, "information noise", crises, environmental dynamics, values, philosophical, and other challenges.

2. Digitisation of Project Management in the Information Society

The paradigm of the information society is based on the use of post-material values - information, knowledge, and digital technologies in all spheres of human activity. In this context, management theory brings project management into the generally accepted methodology for the implementation of management activities.

The project, as a one-time set of actions and tasks, must have clear goals and deadlines for its achievement, and its management must take into account technical, financial, technological, cultural, and other requirements. Project Management Body of Knowledge (PMBOK) represents the project management process as the use of a body of professional knowledge based on the performance of management functions (monitoring the achievement of the project goal, coordinating project functions, managing costs, time, quality, human resources, communications, contracts, risks, project integration) taking into account the ethical aspects and experience of the leader. Effectiveness depends on the use of appropriate techniques and tools in the management process throughout the project life cycle.

Project implementation takes place in a dynamic environment, which requires management to take into account the numerous internal and external influences, limited resources, and unique ways to achieve the goal of each project. In these conditions, processing requires large amounts of information, which inevitably leads to internal conflicts in the presence of information asymmetry. Quality and timely information is the basis for making relevant management decisions, and response time to change is a determining factor in the success of the project. Effective time management, taking into account the perception of information, leads to effective managerial influence on change, which significantly reduces the uncertainty and risk of decisions.

Availability of information is not always an advantage in decision-making; often, “information noise” is created, which does not allow assessing the scale and level of influence of certain factors on the project implementation process. It is with the aim of eliminating such problems that digital technologies are used, which, in the conditions of information surplus and dynamism, have become a key factor in decision-making and for achieving competitiveness.

As a result, companies are increasingly relying on their IT structures, operations, and strategies to realise various benefits, including improving costs, productivity, and service quality (Fischer et al., 2020).

Success is not limited to the largest digital companies. There is no doubt that companies operating on large digital platforms, such as the US Big Four Google, Amazon, Facebook, Apple, and China’s three digital giants Alibaba, Baidu, and Tencent, are outperforming traditional companies. Their performance and global scale make them part of a small and increasingly concentrated group of firms that create shareholder value that exceeds the cost of capital. However, there are a large number of global platform companies in the global economy, around 200 million corporations. While traditional businesses are much slower to build their digital base than hyperscale digital businesses, one important and overlooked observation is that the average digital maturity of existing companies also varies considerably. At one end of the spectrum, over 20% of incumbents still have very low digital engagement. While this share can rise to over 30% in less digital sectors such as automotive (32%) and healthcare, the share of non-digital companies is relatively small in the most digital sectors, such as retail (10%) or telecommunications (7%). On the other hand, there are several traditional companies that already generate more digital cash flow than traditional ones - their emergence also resembles the emergence of superstar firms. In fact, today the 10% of traditional companies with the highest digital revenue generate up to 80% of the digital revenue generated in their sector; this is 60% in the case of professional services, but over 90% in media and telecommunications.

Digital start-ups. Competition is not only between incumbent industry “peers” – fast and slow – when it comes to digitisation. Digitalisation has also given rise to a large number of startups, commonly referred to as “digital natives,” which together compete effectively with incumbents. The United States leads the world in digital startup investment, with around \$220 per capita, compared to just over \$120 per capita in Sweden, the highest in Europe. Digital change is reshaping industry boundaries. The competitive pressure brought about by digitalisation is also felt from outside, from new entrants. This effect is still rare, but it is gaining momentum. Only about 10% of companies are using digital technologies to diversify outside their core industry. However, there is a big difference: the share is twice as high in media, but half as high in retail banking. However, the digital revenue of companies that diversify outside their sector is 25% higher than the rest. The revenue generated by these diversified companies already represents approximately 10% of the total revenue of the sector (on average) and about 25% of the digital revenue of the same sector. Agile and the use of global digital platforms increases the profits of traditional companies. However, developing your own platform is difficult, as global platforms are already thriving in most markets. For this reason, using another company’s platform may be the best way to achieve global reach. However, this strategy can put a company in direct competition with thousands of others who are making the same move.

Digital technologies as a system for maintaining the project management process, using methods of monitoring, modelling, intellectual analysis, and others - allow you to structure information resources, plan the implementation of all processes taking into account the values of the project, respond in a timely manner to changes, manage risks, and prevent their occurrence, identify the results of implementation the project during its life cycle and make relevant management decisions. Using digital technologies, companies are forced to form a certain infrastructure, uniting all executors and project managers to provide effective communication, exchange of information and knowledge. Such an infrastructure will allow performing all management functions - from planning to full project implementation.

Digital technology is a synergy between the power of computing technology and information processing (Shen & Chung, 2007), which plays an important role in the information society, where the amount of information needed to be processed in the decision-making process is growing exponentially. A number of applications are popular in the digital technology market for project management, including Microsoft Office Project Portfolio Server (Portfolio Dashboard), Project Expert, Plainview, as well as various systems for calendar and network planning Microsoft Project, Primavera Project Planner, Primavera Project Expedito, etc.

A review of the project management literature conducted by Kwak & Anbari (2009) showed the key points and prerequisites for effective project management - optimisation, modelling, management, behaviour, success, solutions, process, marketing, and contingencies - emphasising the concurrence of positions on project management and digital technology interactions.

The main tasks facing modern intelligent digital technologies for project management are the need to build an economic model of a project, take into account all factors influencing the process of its implementation, quantitative and qualitative assessment of these impacts, the possibility of assessing risks of various origins (including social, environmental, technological, etc.), opportunities for planning and forecasting and monitoring the implementation of the project. Such systems are usually expensive and do not meet the principle of cost-effectiveness for certain projects, so in the context of digitalisation, there is a demand for cost-effective digital solutions, such as Software-as-a-Service (SaaS), which do not require significant maintenance costs and have a low payback period. The digital management technology market is based on the integration of mobile, social, cloud, and intelligent technologies, giving managers new opportunities to implement their own strategies. Research shows that more and more companies have put digital transformation at the forefront of their priority development scenarios (Fischer et al., 2020).

However, there is a need to coordinate their own experience and organisational models of enterprises, and to develop flexible technological and managerial skills. The processes of implementation of the latest digital technologies must take place in many sections, which becomes a challenge for companies and requires a revision of the management philosophy, as the digital transformation becomes an impetus to revise procedures and change organisational formations.

Based on case studies, two main roles of digital technologies are identified as activators and triggers (Nambisan, 2013): digital technologies as a mechanism (digital technologies can contribute to the development of project management and improve collaboration between project implementers) and digital technologies as a trigger (digital technologies can initiate or lead to innovative processes or results or related organisational procedures and mechanisms). Thus, the use of digital technologies in project management involves not only organisational, technological, and methodological changes, but also requires a special engineering and management approach to configuration management. It is the configuration of platforms, programmes, or digital applications that should provide for the hierarchy of management and the sequence of project implementation processes, all subsystems and components, to provide for the implementation of the necessary functions. The baseline scenario is an agreed description of one or more assets at a given point in time, where the current configuration of a complex product system is described by the latest baseline plus approved changes.

3. Challenges and Prospects of Using Digital Technologies in Project Management

Digital technologies, despite their prevalence and efficiency in use, have a number of threats that have certain features in project management. Prospects for the use of digital technologies in project management depend on the ability to assess such threats and the ability to eliminate them.

First, the prospects for the use of digital technologies in management revealed the emergence of the “new reality”, which was formed during COVID and highlighted the need to change the organisational aspects of the project during its implementation, affecting all aspects of development. The pandemic has resulted in the closure of businesses around the world, with managers facing serious challenges such as uneven distribution of consumer demand, supply chain disruptions, poor execution, management of information flow, and lack of strategic decision-making (Pedersen & Ritter, 2020). This “new reality” was explored by Griffin & Denholm (2020), proving the impact of this reality on everyday life in the near future. “Although many companies were forced to close or significantly reduce their activities, those organisations that continued to operate had to operate in a changing landscape of new processes and practices that affected social distancing requirements and changed work patterns” (Leidner, 2020; Richter, 2020). New ways of working remotely using new digital communication systems and the need to completely rethink their business models to adapt to the realities of the COVID-19 environment have been explored (Carroll & Conboy, 2020), and the impact of the COVID-19 pandemic on research and information management practices in terms of transformations of education, work, and life have been thoroughly described by Dwivedi et al. (2020).

The pandemic has forced businesses into unprecedented changes based on digital technologies that allow avoiding the loss of information, creating platforms for effective management of projects, processes, resources, “disruption of supply chains, delays in decision-making, increased uncertainty and collapse of demand” (Pedersen & Ritter, 2020). The pandemic has become a reality, and the world continues to face bursts of new waves. To neutralise the negative impact on management processes, it is necessary to develop a strategy for the introduction and improvement of digital technologies in the company.

Another challenge is that project management using digital technologies requires the manager to analyse large amounts of data, so-called Big Data, which requires special configurations and support for complex data analysis systems. “As we enter an era of ‘big data’, asset information is becoming a deliverable of complex projects. Prior research suggests digital technologies enable rapid, flexible forms of project organising” (Whyte, Stasis, & Lindkvist, 2016). Digital technology allows data mining to be applied to complex projects. In this case, management requires new practices and control over the reliability of the initial information. Digital technologies in project management perform functions such as search, storage, structuring, and intelligent analysis, and allow you to manage processes remotely. In projects, most of this data is classified and structured, although it can be combined with various sources of unstructured data in projects that were previously ignored (Boyd & Crawford, 2012).

The digitalisation of most areas of human activity is a consequence of the striking growth of computing power, memory capacity, and bandwidth of IT communication channels. To realise the capabilities of computing and information networks, many devices have been developed to convert information into digital form - all kinds of video, audio and other devices, digital measuring instruments of various modalities. Thanks to their active use, every two years humanity produces, processes, and stores more information than in the entire previous history of its development. The growth of the volume of digital data available for processing is significantly ahead of the process of humanity's awareness of effective ways of using it, and even more so, the ability of individual people to understand it. If the development of digital technologies has fairly clear guidelines, an increase in computing power, bandwidth, accuracy, reduction in specific energy consumption, and other improvements in technical parameters. Then, the process of development in the field of big data processing is largely carried out by trial and error. Classical methods of statistical analysis are used, new algorithms are developed, and new approaches to data processing are involved, such as

machine learning (ML). The hopes in the field of machine learning (ML) are associated with AGI (artificial general intelligence) - information tools with superhuman capabilities for structuring and processing data.

The main breakthrough in recent years in the field of ML has been the neural network revolution, which began with progress in image processing and then spread to very broad areas of data processing. The paradigm shift in the use of neural networks is the use of neural computations, capable of independently forming rules for extracting features based on processing a huge number of examples. The main ideas of modern neural computations were put forward in the 80s-90s of the last century, but then they could not be implemented in commercial products - computers did not allow working with large data structures, and on small amounts of data, neural computations lost to heuristic ML algorithms.

With the beginning of the new millennium, the situation began to change. In 2005-2007, the first works began to appear describing the currently widely used methods of pre-configuration, training, and structural organisation of neural networks. The ideas of information processing became widespread. In general, the success of the modern wave of neural network computing is usually explained by the synergy of the following factors, which are considered by analogy with the necessary components for launching a rocket. The success of neural computing was facilitated not only by progress in the technology of manufacturing computers, graphics accelerators, and network components, but also by advances in programming. The development of the Internet contributed to the collection, transmission, and collective processing of large volumes of data. The ability to conduct computational experiments with complex models of neural networks on big data made it possible to achieve new successes in the structure of neural computing.

The successful commercial application of neural network approaches has provided stable funding for new developments in the field of neural computing. One of the first large companies to include neural network technologies in its plans in 2012-2013 was NVIDIA, followed by even larger companies such as Intel, IBM, Google, Baidu, Samsung, YaMech, and others.

Currently, almost all companies involved in information processing and all countries that claim to participate in technological progress are seriously engaged in the topic of neural networks.

Research in the field of neural computing is being conducted on a wide front, mass training of machine learning specialists is being carried out, and new centres for research and development of tools for neural computing are being opened. Given the constantly growing level of funding, tasks appear every month that are successfully solved based on neural computing.

The age-old task in the development of the theory and practice of neurocomputer computing is the creation of powerful artificial intelligence - AGI (artificial general intelligence) - technical means with superhuman capabilities for structuring and processing data.

The main problem of AGI is the formation of a description of the complex real world, its various properties and all possible ways of influencing development processes.

To solve this problem, it is necessary to have:

- A method of universal description of objects and phenomena;
- The ability to identify individual objects and phenomena from data;
- Means of forming a forecast of the development of events;
- Methods of setting goals (intermediate and global) to achieve them;
- Effective analysis of options for action to achieve the set goals.

Structured data, describing certain phenomena or processes, forms arrays of information. In project management, the focus is on information, knowledge, and its use to create added value. In this case, attention requires the problem of configuration as a component of the project management information system.

Information management challenges such as security, privacy, access control, encryption, integrity and accessibility can be addressed through blockchain technology. Digital technologies are based on blockchain (DApp) for the secure management of Industry 4.0 asset information.

Project management, using digital technologies, faces the problem of changing management principles, as well as the need for significant investment to automate project management. The role of digital technologies in achieving management efficiency is determined by the cost of development, implementation, and maintenance of such technologies. To evaluate and define digital technologies in each individual case, a quantitative and qualitative assessment should take place, including performance/cost measurements, as well as benchmarking and expert assessment. The difficulty in this process is the method of determining the value of information created by digital technologies.

An attempt to determine the value of economic information is found in the work of Manzhula, Semanyuk, & Rozhelyuk (2019), where the economic interpretation of information involves the use of categories of value of information, information as a resource, commodity, and object of labour.

The value of economic information can also be expressed through the economic consequences of its perception or disregard. Failure to take into account information increases uncertainty in management decisions, which leads to economic losses. The expected value of the information (EVI) will be equal to the amount of uncertainty reduction after accounting and analysis of relevant information:

$$EVI = EOL_1 - EOL_2,$$

where EOL_1 is the uncertainty (probability of incorrect decision) without taking into account the estimated information multiplied by the error price (loss equivalent); EOL_2 is - uncertainty given the information, estimated, multiplied by the cost of error. It has been proven that for estimating of cost of creation of the information, it is expedient to apply the interval approach used to generate initial data in the form of data sets I , introducing such notation: I_l – the amount of information being evaluated, I_n – the amount of information that can be recorded, that is, to carry out its accounting, I – the amount of complete information about the internal and external environment of the enterprise. Accordingly, the inclusion will be fair $I_l \subset \dots I_n \subseteq I$ (Manzhula, Semanyuk, & Rozhelyuk, 2019).

This approach requires detailed study and development. However, in project management, it makes it possible to evaluate information, taking into account the completeness of the model, the assessment of which is based on the average difference between the span of the information obtained on the basis of taking into account the information and the initial uncertainty intervals. To quantify the value of information, you can use its expression equivalent to the nature of the efficiency indicator used, as the use of information can give not only economic, but also social, environmental, and other effects.

4. Digital Technologies in Project Management of Public Administration

An information society with unlimited access to information requires the public administration system to involve citizens in the implementation of projects that might or might not be aimed at meeting the needs of the latter. Practices of involving citizens in policy-making require the use of digital technologies (Internet applications and mobile communications). This is evidenced by the development of many special digital platforms that provide interaction, cooperation, and involvement of citizens in various government activities and the provision of public services.

Project management in public administration requires the use of digital technologies for cooperation between governments and citizens. Using social media, media and other ways to engage, managers face challenges, the main of which are organisational and technological aspects considered through the prism of democratic principles. Falco & Kleinhans (2018) analysed a number of scientific studies on these issues, giving a clear classification of challenges and describing their nature. Understanding the challenges facing project management in public administration in the application of digital technologies provides an opportunity to understand the

prospects for the introduction and use of digital technologies for public administration (G2C) and for cooperation between citizens and government (C2G).

Digitalisation benefits early adopters and innovators.. In the past, when companies faced heightened uncertainty and volatility, the rational strategic response was to hold back, let competitors bear the costs of experimentation, and then make their move. This approach reflected a company's commitment to "getting ahead" of its competition. However, in the digital war, early adopters and innovators gain a huge advantage over their competitors. It was found that the three-year revenue growth (over 12%) for the fastest companies was more than double that of companies that played it safe and were slower to respond to digital competition. Why is this happening? Because early adopters have a knowledge advantage. They test and learn relentlessly, launch early prototypes, and process results in real time, reducing development time from days to months, depending on the industry. They scale platforms and build AI-powered information networks at a speed that allows them to stay several architectures ahead of slower competitors. As a result, they release version 3.0 or 4.0 of a product before their competitors release version 1.0. Innovators embed information throughout their business model, including engineering, marketing, sales, and internal operations.

Digital technologies for public administration need to have specific features to perform different functions, to take into account different decision-making scenarios and the interests of a democratic way of governing.

The main functions necessary for the management process are the function of collecting information and opinions of citizens, exchange of knowledge and information about public initiatives. In order to implement projects, the function of discussing, interviewing, evaluating, expressing comments and suggestions, rating ideas and suggestions, modelling situations, and designing is a necessary element of digital platforms for public administration.

An example of the use of digital technologies in public administration is the project of the Ministry of Digital Transformation of Ukraine "Diya" (Action), which provides more than 50 government services through the digital application, and by 2024, 100% of services provided by the state will be available online. Despite the success of the project in Ukraine, the actual use of digital technologies in local governments is not so successful. The use of digital technologies in project management of public administration faces challenges.

Among the main challenges, we single out technological, organisational, and substantive ones. These groups of challenges are more tangible in the processes of using digital technologies in public administration by virtue of the specifics of controlled processes. The technological challenges include the general level of technological progress in the country, the speed and innovativeness of changes in management processes, the lag of government initiatives behind technological progress, etc.

Solving the problem of developing recommendations for complex, interconnected tasks has always been a popular product, supported by solvent demand. The development of neural network computing provides a new, more powerful automatic technology for generating such solutions. Many problems on the way to a competitive commercial product in this area have yet to be solved. But if 10-15 years ago these problems did not seem solvable, then over the past 5 years, confidence in the possibility of their solution has strengthened.

Around the world, the successes of the application of neural network AI (artificial intelligence) systems and the stable funding received due to this in this **field** are significant. An industry has been formed that produces electronic components and devices for neural network computing. There are personnel for the development and production of intelligent commercial products based on neurotechnology. Research centres and industrial laboratories operate, journals are published, the exchange of program code between researchers and AI developers is established, and dozens of congresses and conferences on neural network topics are held annually. All this, of course, does not guarantee an immediate breakthrough in solving the problem of creating AI, but it

creates favourable conditions for it. Every year, the forecast for the date of creation does not move further and further into the future, but, on the contrary, it gets closer.

Organisational challenges include the availability of qualified human and social resources. The semantic challenges most influential in the processes of digitalisation of public administration are manifested in the scale of Internet accessibility for citizens, digital literacy, information asymmetry, and the way of thinking and perception of the philosophy of the information society. In this context, the issues of completeness and reliability of data received on digital platforms from the public, the objectivity and representation of this data in terms of openness and quality of information are important.

That is why the problems of using digital technologies in public administration go beyond the technological dimension and focus on the level of organisational and substantive challenges that need to be overcome.

5. Conclusions

Digital technologies are transforming the management process methodology and destroying traditional business models, providing new business opportunities related to Industry 4.0 and the need to adapt to new operating conditions. An analysis of the future impact of digital transformation on the model of business efficiency and satisfaction of various actors, as well as the challenges and threats facing businesses in connection with the introduction of digital technologies, was conducted.

The study showed the importance of using digital technologies in project management, as well as the lack of modern tools for use in project management of public administration. The use of digital technologies solves the problem of management information support, presents the status, problems and results, and allows you to make effective management decisions in real time.

Observation from the unexpected COVID-19 economic crisis proves the importance of digitisation at both the enterprise and public administration levels. The challenges and prospects of using digital technologies in public administration are described, presented as a condition for designing and modelling future management decisions.

References

- Boyd, D., & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. *Information, Communication, & Society*, 15, 662–679. <https://doi.org/10.1080/1369118X.2012.678878>
- Carroll, N., & Conboy, K. (2020). Normalising the “new normal”: Changing tech-driven work practices under pandemic time pressure. *International Journal of Information Management*, 55, 1–6. <https://doi.org/10.1016/j.ijinfomgt.2020.102186>
- De, R., Pandey, N., & Pal, A. (2020). Impact of digital surge during Covid-19 pandemic: A viewpoint on research and practice. *International Journal of Information Management*, 55, 1–5. <https://doi.org/10.1016/j.ijinfomgt.2020.102171>
- Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., Gupta, B., Lal, B., Misra, S., Prashant, P., Raman, R., Rana, N. P., Sharma, S. K., & Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: transforming education, work and life. *International Journal of Information Management*, 55, 1–20. <https://doi.org/10.1016/j.ijinfomgt.2020.102211>
- Falco, E., & Kleinhans, R. (2018). Beyond technology: Identifying local government challenges for using digital platforms for citizen engagement. *International Journal of Information Management*, 40, 17–20. <https://doi.org/10.1016/j.ijinfomgt.2018.01.007>
- Fischer, M., Imgrund, F., Janiesch, C., & Winkelmann, A. (2020). Strategy archetypes for digital transformation: Defining meta objectives using business process management. *Information & Management*, 57(5), 1–13. <https://doi.org/10.1016/j.im.2019.103262>
- Griffin, D., & Denholm, J. (2020). This isn't the first global pandemic, and it won't be the last. Here's what we've learned from 4 others throughout history.

- Handy, C. (1995). Trust and the virtual organization. *Harvard Business Review*, 73, 40–50. <https://hbr.org/1995/05/trust-and-the-virtual-organization>
- Kwak, Y. H., & Anbari, F. T. (2009). Analyzing project management research: Perspectives from top management journals. *International Journal of Project Management*, 27(5), 435–446. <https://doi.org/10.1016/j.ijproman.2008.08.004>
- Leidner, D. E. (2020). Editorial reflections: Lockdowns, slow downs, and some introductions. *Journal of the Association for Information Systems*, 21(2), 264–267. <https://doi.org/10.17705/1jais.00600>
- Manzhula, V., Semanyuk, V., & Rozhelyuk, V. (2019). Evaluation method of economic benefit taking into account additional data in decision-making process. <https://doi.org/10.1109/ACITT.2019.8779982>
- McDonald, P. (2011). It's time for management version 2.0: Six forces redefining the future of modern management. *Futures*, 43(8), 797–808. <https://doi.org/10.1016/j.futures.2011.05.001>
- Nambisan, S. (2013). Information technology and product/service innovation: A brief assessment and some suggestions for future research. *Journal of the Association for Information Systems*, 14(4), 215–226. <https://doi.org/10.17705/1jais.00327>
- Nerubasska, A., & Maksymchuk, B. (2020). The demarkation of creativity, talent and genius in humans: A systemic aspect. *Postmodern Openings*, 11(2), 240–255. <https://doi.org/10.18662/po/11.2/172>
- Nerubasska, A., Palshkov, K., & Maksymchuk, B. (2020). A systemic philosophical analysis of the contemporary society and the human: new potential. *Postmodern Openings*, 11(4), 275–292. <https://doi.org/10.18662/po/11.4/235>
- Onishchuk, I., Ikonnikova, M., Antonenko, T., Kharchenko, I., Shestakova, S., Kuzmenko, N., & Maksymchuk, B. (2020). Characteristics of foreign language education in foreign countries and ways of applying foreign experience in pedagogical universities of Ukraine. *Revista Romaneasca Pentru Educatie Multidimensionala*, 12(3), 44–65. <https://doi.org/10.18662/rrem/12.3/308>
- Pedersen, C. L., & Ritter, T. (2020). Preparing your business for a post-pandemic world. *Harvard Business Review*. <https://www.harvardbusiness.org/wp-content/uploads/2020/04/HBR-Preparing-your-Business-for-a-Post-Pandemic-World.pdf>
- Richter, A. (2020). Locked-down digital work. *International Journal of Information Management*, 55, 1–3. <https://doi.org/10.1016/j.ijinfomgt.2020.102157>
- Seetharaman, P. (2020). Business models shifts: Impact of Covid-19. *International Journal of Information Management*, 54, 1–4. <https://doi.org/10.1016/j.ijinfomgt.2020.102173>
- Sein, M. K. (2020). The serendipitous impact of COVID-19 pandemic: A rare opportunity for research and practice. *International Journal of Information Management*, 55, 1–3. <https://doi.org/10.1016/j.ijinfomgt.2020.102164>
- Shen, Q., & Chung, J. K. H. (2007). The use of information technology by the quantity surveying profession in Hong Kong. *International Journal of Project Management*, 25(2), 134–142. <https://doi.org/10.1016/j.ijproman.2006.09.005>
- Whyte, J., Stasis, A., & Lindkvist, C. (2016). Managing change in the delivery of complex projects: Configuration management, asset information and ‘big data’. *International Journal of Project Management*, 34(2), 339–351. <https://doi.org/10.1016/j.ijproman.2015.02.006>