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LONG-TERM THINKING IN PUBLIC GOVERNANCE UNDER THE DIGITAL ERA

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ABSTRACT

The high dynamics of geopolitical change have put new demands on state and economic management. The speed with which these requirements must be met raises the question of the need for a technological breakthrough in the field of governance. Moreover, the scale of changes in the global economy requires special attention to strategic planning, the role of which in the public administration system has increased to a level that will ensure the orientation of all governing bodies to achieve the goals of society's development. The topic's relevance is determined by the increasing role of strategic planning and forecasting in the public administration system of developed countries in the digital society. To understand how digital transformation profoundly affects strategic planning in public administration, we use a systems thinking approach to analyse setting goals and achieving targets for the state's environment that can be improved through digital technologies. The article discusses the issues of strategic planning technologisation, the challenges to which the new strategic planning system should respond, some risks of digital transformation of public administration and possible ways to overcome them. The novelty of strategic planning in the context of digital transformation lies in modernising methodological and analytical support for the strategic planning system, taking into account the main consequences and requirements of creating and disseminating digital technologies in various spheres of society.

Keywords: digital transformation, strategic planning, public administration.

1- INTRODUCTION

The world has recently witnessed a digital transformation of the public sector, a transition from e-government to a "fully open" and effective digital government. This development is facilitated by introducing information and communication technologies in public administration and politics (as new ideologies of e-government and the digital state). There is a shift in emphasis from the idea of "governance to you" to the concept of "governance with you".

One of the integral tools of public administration is strategic planning. The term "strategising" is also used to refer to it, which reflects the institutional element of the strategic management system in public administration. This system is expressed in forecasting, planning, programming, designing, implementing, renovating the future, and creating appropriate ontological spaces and platforms of the future reality.

Strategic planning is one of the most popular approaches to managing modern organisations, consistently ranked among the top five most popular management

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approaches worldwide[1]. It has long been the preferred approach to strategy formulation in government organisations at all levels of public authority. It typically involves analysing the organisation's mandate, mission, vision, and internal and external environment, identifying strategic issues based on these analyses, and implementing strategies to address them[2].

Strategic planning is the most important branch of public administration and the most developed area in the context of public policy implementation. Public administration is transforming under the influence of digitalisation, the most active process and product of the Fourth Industrial Revolution. In today's environment, the achievements of the digital revolution are being implemented everywhere in the practice of public authorities. Automation, digitisation, and artificial intelligence are now integral to any economic decision. In recent years, digitalisation has also become a strategic planning tool.

Thus, the article aims to study the aspects of digital transformation of strategic planning as an element of the public administration system.

Literature review

According to Schumpeter's theory[3], a key aspect of economic development is the introduction of innovations. In practice, in public administration, this can be implemented by optimising existing business processes, automating repetitive actions (for example, using standard responses to citizens' appeals), and introducing digital technologies into production processes in various sectors of the economy. Moreover, digital transformation can become one of the tools for solving existing strategic management problems, as it promotes transparency at multiple levels and citizen engagement (through feedback, performance evaluation, participation in hearings and voting).

Approaches to the digital economy in scientific sources are ambiguous. Different researchers offer many points of view. The term “digital economy” itself is inextricably linked to the concept of the “fourth industrial revolution” or “industry 4.0”, which first appeared not so long ago.

The fundamental provisions of the digital economy were formulated in the works of scholars such as Tapscott[4, 5], Dong[6], Negroponte[7], and Kagermann[8], who considered

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[1] **Wolf, C., & Floyd, S. W. (2017). Strategic planning research: Towards a theory-driven agenda. *Journal of Management, 43*(6), 1754–1788. https://doi.org/10.1177/0149206313478185**

[2] **Bryson, J. M. (2018). *Strategic planning for public and nonprofit organisations: A guide to strengthening and sustaining organisational achievement.* John Wiley & Sons.**

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[4] **Tapscott, D. (1994). *The digital economy: Promise and peril in the age of networked intelligence.* McGraw-Hill.**

[5] **Tapscott, D. (2014). *The digital economy anniversary edition: Rethinking promise and peril in the age of networked intelligence.* McGraw-Hill.**

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various technological aspects and consequences of the development of digital technologies that led to the emergence of the "digital society".

In 2016, the World Bank proposed a more detailed definition, defining the digital economy as a new stage of development that emerged due to the Fourth Industrial Revolution. This economic system is based on the predominance of intellectual property, knowledge, and digital technologies while developing completely new skills and opening up previously unknown opportunities for the development of society and the private and public sectors. This also applies to improving strategic planning in public administration. There are several relevant official documents of states and international organisations on this range of issues that are of high research interest[9,10 , 11, 12, 13].

It should be noted that neither data-driven models based on open data nor platform solutions used in the open government phase are the results of the digitalisation of public administration. These are only the initial steps in the digital change process that will hopefully lead to complete digitalisation and competent government in the future[14].

Even though most studies of digital transformation in public administration emphasise a single approach, many approaches are proposed in the academic world. Digital transformation is an ongoing process[15] that involves changing how public administration communicates with its most important stakeholders. Digital change is indeed a dynamic phenomenon.

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[6] **Dong, H., Hussain, F. K., & Chang, E. (2007). An integrative view of concept of digital ecosystem. In *Proceedings of the International Conference on Networking and Services (ICNS '07)* (pp. 42–44). IEEE. https://doi.org/10.1109/ICNS.2007.33**

[7] **Negroponte, N. (1996). *Being digital.* Vintage Books.**

[8] **Kagermann, H., Lukas, W.-D., & Wahlster, W. (2011). Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur. *VDI Nachrichten*, (13), 2. https://www.dfki.de/fileadmin/user_upload/DFKI/Medien/News_Media/Presse/Presse-Highlights/vdinach2011a13-ind4.0-Internet-Dinge.pdf**

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[15] **Janowski, T. (2015). Digital government evolution: From transformation to contextualisation. *Government Information Quarterly, 32*(3), 221–236. https://doi.org/10.1016/j.giq.2015.07.001**

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In digitalisation, public institutions are taking on new responsibilities and digitising existing procedures to function better, while civil servants need to develop digital skills[16].

Despite changes in policy and governance, many digitalisation efforts are still failing to achieve their goals[17]. One possible explanation for this is that internal and external parties lack the necessary digital knowledge and skills, as [18] suggested. Due to its key role, digital skills are essential for digital transformation in the public sector to prepare the next generation of civil servants for the changes that will come to the administration[19]. Despite the many published papers on government digitalisation, research has shown that inconsistencies and gaps in conceptual and practical implications characterise theoretical and empirical advances.

Methodology

The primary research method is analysing historical and current trends in the public administration system. In writing the article, the author used scientific methods of system analysis and comparative and logical analysis.

Different approaches to defining "strategic planning" emphasise certain aspects of this state system, but no general definition exists.

Thus, we accept that strategic planning in public administration is a multimodal (reflecting the possibility of using various modules) complex of state-level instruments and relevant activities of public administration entities, as well as elements of the public administration process and public policy, framed either by higher levels (echelons) of the public administration system for the long term or within the entire public administration system. The most key and large-scale issues and the most significant areas of public administration in this context are:

- planning, programming, design, implementation (formation) and validation of ontologies and ontological spaces, tool platforms, contours and points of assembly of the future reality - in order to shape the reality of the future, predictive design of the future (about the subject-object area of public administration and the public administration system itself, legal and public order in general), related conceptual,

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[17] **Saleh, A., & Awny, M. M. (2020). Digital transformation strategy framework. In *International Association for Management of Technology (IAMOT) 2020 Conference Proceedings* (pp. 1207–1219). https://www.researchgate.net/publication/382561299_DIGITAL_TRANSFORMATION_STRATEGY_FRAMEWORK**

[18] **Rupp, C. (2017). *E-Government in Europe – warum es in Österreich gut funktioniert.* Institut für den öffentlichen Sektor. https://publicgovernance.de/media/E-Government_in_Europa_warum_es_in_Oesterreich_gut_funktioniert.pdf**

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doctrinal and prognostic support, including the formulation of strategic plans, expectations;

- prognostic and design task of designed, programmed and validated modules (implementation methods) and algorithms of active targeted actions in order to obtain (achieve) the expected (laid down) results and states of related design solutions, missions and functionalities associated with them and envisaged for the concentrations of strategising as an active part of strategic planning);

- formation of a verification (reference) matrix of political and strategic guidelines and indicators – to assess the efficiency, effectiveness and other projected and, accordingly, expected qualities of public administration, public policy, and achievement of the set goals (verification part).

2. DIGITALIZATION OF STRATEGIC PLANNING IN PUBLIC ADMINISTRATION

Traditionally used approaches and tools of strategic planning in public administration have largely exhausted themselves, do not produce and do not provide the expected results today, do not allow for proper public administration efficiency or prevent the decline in such efficiency. As a result of the formation of an intelligent digital economy, the strategic planning process itself is significantly changing, as dictated by the peculiarities of the ontology of this generation of economy.

The use of the latest technologies, artificial intelligence units, and other advanced technologies is not only possible but has already been confirmed (in a number of countries).

The problem of digitalisation and the general trend towards digital public administration are strategic, as they imply the creation of a long-term foundation for the transition to a new economic system. The use of digital products and solutions is considered an innovative approach to development, without which, unfortunately, it is impossible to build a competitive economy.

Tangible digital products characterise the digital economy. One of its directions is the modernisation of systems of relations, both socioeconomic and cultural. All current business processes are being reviewed and analysed for optimisation, including those related to public administration. The main goal of digital transformation in this area is to create a customer-oriented digital government by simplifying procedures for obtaining public services, reducing administrative barriers and the distance between the state and society, and involving business through consulting services in public administration processes (for example, the development and implementation of digital platforms, as well as their maintenance can be delegated).

A general trend in the digitalisation of public administration is forming a platform model that allows for increased management efficiency by creating the necessary comprehensive information and telecommunications infrastructure for interagency cooperation and accelerated service delivery. Such solutions allow for automating the process of collecting and processing statistical reports and accelerating the procedure for their transfer to other sectoral departmental structures. They also help reduce the

workload on staff, thereby increasing labour productivity in the public authority and its efficiency in the public administration system.

Digital platforms, as a form of interaction between participants and/or management entities, aim to minimise various types of costs.

Unified formats for presenting heterogeneous data and standardised procedures for processing them within a single digital platform to support strategic planning functions provide new opportunities for formalising and implementing tasks in the unit:

1. Strategic goal setting: identifying opportunities and limitations for the use of development potentials; retrospective identification and prompt correction of development priorities; assessing the validity and selection of long-term development benchmarks with the task of setting and agreeing on a set of benchmarks for key indicators and criteria for evaluating development; identifying risk factors for failure to achieve development goals and evaluate the consequences of deviations;

2. Strategic programming: 1) forming the composition of measures to achieve development goals and objectives; 2) identifying and allocating the necessary resources to ensure the implementation of measures with given effectiveness; 3) forming and agreeing on a schedule for the implementation of measures; 4) assessing the sensitivity of the implementation of the composition of programme measures, taking into account the identified risk profile and development chances in terms of timing, resources and results.

Today, due to the fourth industrial revolution, big data and methods of working with it are becoming increasingly important. This is due to the need to analyse a significant flow of unstructured information when building competent and effective strategic planning and management. Big Data is essential both at goal setting and end-to-end management stages in developing a unified public policy; monitoring of implementation and evaluation of results is also essential. Introducing methods and tools for working with Big Data is one of the directions of such a strategic document as a national programme.

For example, the United States government was among the first to realise that big data can be used in all spheres of life, including the public administration system. In 2014, a national strategy for working with big data was approved[20], which set out the main provisions of US government policy on the development and use of big data by citizens, businesses and agencies. In 2016, a National Science and Technology Council subcommittee developed the Federal Big Data Research and Development Strategic Plan[21]. Further evolution of the US government policy in the field of big data has led to

[20] **Executive Office of the President. (2015).** ***Big data: Seizing opportunities, preserving values. Interim progress report.*** https://obamawhitehouse.archives.gov/sites/default/files/docs/20150204_Big_Data_Seizing_Opportunities_Preserving_Values_Memo.pdf

[21] **National Science and Technology Council (U.S.). (2016).** ***The Federal Big Data Research and Development Strategic Plan.*** https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/bigdatardstrategicplan-nitrd_final-051916.pdf

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the fact that the new federal strategy "Using Data as a Strategic Asset" [22], adopted in 2020, considers data as a national resource with significant social value and is used to solve problems in the field of healthcare, education, national security, and energy.

A targeted data policy as one of the main areas of implementation of the digital strategy is being pursued by the EU, which in 2020 adopted the European Strategy for Data [23], aimed at creating a common European data space for the functioning of a single data market (from around the world). Nine priority European data spaces have been identified: industrial (production) data space; green agenda data; mobility data space; health data space; financial data space; energy data space; agricultural data space; public administration data space; education data space; and the European Open Science Cloud.

Today, there is much talk about the need for the latest technologies in strategic planning in public administration: blockchain technologies[24], big data technologies[25], Industrial Internet of Things technologies[26], cloud technologies[27], neurotechnologies[28], digital (machine) formalisation of law, and finally, law formation.

Table 1 shows the promising areas for using artificial intelligence and other digital technologies in strategic management, specifically strategic planning and forecasting.

Table 1. Opportunities for digital technologies in strategic forecasting

Digital technology	Method of implementation	Possibilities of application in forecasting	Operational planning tasks
Artificial intelligence (AI)	Continuous intelligence analysis	operational management of business processes and data flows; customised data aggregation and transformation through machine learning; processing of analytical data arrays;	processing of historical data sets to identify patterns; coverage of more factors in factor analysis; analysis of metadata about the platform or ecosystem; market trend analysis and benchmarking can help generate new conceptual ideas;

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[25] **Loshin, D. (2013).** ***Big data analytics: From strategic planning to enterprise integration with tools, techniques, NoSQL, and graph.*** **Elsevier.**

[26] **Gilchrist, A. (2016).** ***Industry 4.0: The industrial Internet of Things.*** **Apress.**

[27] **Millard, C. (Ed.). (2013).** ***Cloud computing law.*** **Oxford University Press.**

[28] **Mirjalili, S. (2019).** ***Evolutionary algorithms and neural networks: Theory and applications.*** **Springer.**

		identification of system errors; rehabilitation of the strategic planning system - recording and early warning of changes and anomalies in data flows;	
Visual and intuitive extraction of useful information (VI technologies)	Virtual simulation software	analysis, interpretation and presentation of data in a clear graphical form;	group analysis in a conference or brainstorming session. Track the parameters' dynamics by building a dynamic visualisation of the economic model about individual elements (factors) and other models.
Cognitive technologies	Brain-computer interface (BCI)	situational analysis; managing the development of events in crises.	development of principles and methodology for analysing possible problem situations; development of analytical scenarios for the development of problem situations; "prescriptive analysis", which predicts the behaviour of subjects;
Cryptography	Methods of ensuring confidentiality and data protection based on cryptographic algorithms or cellular network technologi	ensuring data trust; remote access control; identification of users (counterparties and other stakeholders); consensus validation; identification of imbalances in the formation of decision-making scenarios (using simulation models)	transition to digital transactions and smart contracts; ensuring the legal significance of semantically related data.

	es (WMIN).		

Source: based on[29]

3. ANALYSIS OF THE APPLICATION OF THE LATEST TECHNOLOGIES IN STRATEGIC PLANNING

Among the methods of direct involvement of artificial intelligence technologies and systems, as well as other specific (from among the above) technologies in strategic planning in public administration, it is reasonable to highlight the following:

- the use of ontologies and other augmented reality technologies in scenario-based predictive modelling[30];
- use of the latest information technologies for BIM modelling[31];
- the use of aspect models[32];
- technologies of "geospatial data factories", "subject area ontology factories", "application assembly factories"[33];
- "models of digital monopolies"[34];
- predictive prototyping (modelling) of the process based on its three-dimensional computer virtual (digital) model;
- use of "regulatory sandbox" technologies;
- industrial Internet of Things technologies[35].

[29] **Lu, H., Li, Y., Chen, M., Kim, H., & Serikawa, S. (2018). Brain intelligence: Go beyond artificial intelligence. *Mobile Networks and Applications, 23*, 368–375. https://doi.org/10.1007/s11036-017-0932-8**

[30] **Agbossou, I. (2023). *Urban augmented reality for 3D geosimulation and prospective analysis.* IntechOpen. https://doi.org/10.5772/intechopen.1002352**

[31] **Wei, J., Chen, G., Huang, J., Xu, L., Yang, Y., Wang, J., & Sadick, A.-M. (2021). BIM and GIS applications in bridge projects: A critical review. *Applied Sciences, 11*(13), 6207. https://doi.org/10.3390/app11136207**

[32] **Nederveen, G. A., & Tolman, F. P. (1992). Modelling multiple views on buildings. *Automation in Construction, 1*(3), 215–224. https://doi.org/10.1016/0926-5805(92)90014-B**

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4. DIGITALIZATION TRENDS IN STRATEGIC PLANNING

The following areas of possible future involvement of artificial intelligence systems in the system of public strategic planning in strategic, operational and instrumental current planning and programming in public administration can be substantiated:

1) implementation of prognostic multi-scenario complex analysis, construction of scenario forecasts and models within the framework of public administration planning and programming;

2) implementation of operational and instrumental current planning and programming of public administration in real time; appropriate assessment of the current situation, development and adoption of applied decisions;

3) planning and programming of public administration under conditions of uncertainties and risks, complex ontologies, and crisis conditions; production of complex and highly complex predictive scenario modelling (scenario planning), as well as such modelling under conditions of significant uncertainties.

At the same time, the determinants (causal and opportunity factors) of the need, pragmatic value and rationality of integration, involvement of artificial intelligence technologies and systems in the process of strategic planning within the framework of public administration are as follows:

1) under conditions when key public administration actors are increasingly forced to use and operate with large numbers, scenarios with nonlinear (ambiguous (hysteresis), scalar (step), other nonlinear) processes, exponentially growing and already critical overload of key data and a sharp reduction in the time required for decision-making, it is evident that the intellectual and analytical abilities and capabilities of the human brain (even a large group of people) to solve current strategic planning tasks have been exhausted, and it is possible to cope with this today only with the involvement of artificial intelligence technologies and systems;

2) in the context of diversified complications and an increase in the number of factors influencing the outcome of designing, making and implementing management decisions in public administration, the complication of the ontology of the public administration system, a person - a managerial decision-maker – is no longer able to make decisions for the future (optimally) without computer software (machine) support, but even more so to monitor the progress and actual results of its implementation, to control and evaluate its effectiveness;

3) in the context of determination (fully determining influence) of priority areas, emphasis, prevailing ideologies, and trends in public administration and politics by subjectively formulated and determined by political motives (often far from public interests), or even corrupt interests, it is almost impossible to find another tool today. Adequate directions are those that meet the public interest, social expectations, demands and requirements of approaches and measures in public administration and validation (confirmation of actual compliance with the requirements and agreed parameters) of these approaches and measures;

4) the intensive growth of the regulatory mass of legislation has already exhausted the potential of intellectual and analytical abilities and the ability of the human brain (even a large group of people) to promptly and comprehensively monitor the quality of legal regulation (a person is still able to assess the quality of legislation only in some, separate and minimal cases) and identify defects in legal regulation at a still acceptable level of quality;

5) the search for genuinely new technologies of strategic planning in public administration is impossible without the use of artificial intelligence technologies; today (and for some time to come), we do not understand, do not realise and do not even assume what these promising technologies can be in principle, what their nature can be, what tasks they can solve, what the tasks themselves and the formats of their presentation will be transformed into in this regard;

6) the tendency of complication and nonlinear change of the chronological ontology of the public administration system in these conditions, critically excessive slowness, inflexibility, "clumsiness", and, most importantly, a poor operational system of strategic planning (even in the best version today, but without the use of artificial intelligence technologies).

5. DISCUSSION

Despite the popularity of strategic planning, its effectiveness has been criticised by scholars in business and public organisations. One of the first and most prominent critics was Mintzberg[36], who argued that strategic planning is not the same as strategic thinking. Planning is about analysis - about breaking down a goal into steps, formalising those steps, and articulating the expected outcomes. Strategic thinking is about synthesis. It involves intuition and creativity, which cannot be automated. Martin[37] highlighted the "big lie of strategic planning" and argued that it misleadingly limits managers' belief that strategy can be controlled. Similarly, the lack of effectiveness of strategic planning has been argued[38]. These criticisms point to the ongoing debate over whether strategic planning works[39].

Special mention should be made of introducing artificial intelligence (AI) in general public administration and strategic planning. In addition to the need to create reliable neural networks, i.e. neural networks that have been trained with reliable data, numerous other AI risks unrelated to data quality or access to data will have to be

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[36] **Mintzberg, H. (1994). The fall and rise of strategic planning. *Harvard Business Review, 72*(1), 107–114. https://hbr.org/1994/01/the-fall-and-rise-of-strategic-planning**

[37] **Martin, R. L. (2014). The big lie of strategic planning. *Harvard Business Review, 92*(1–2), 3–8. https://hbr.org/2014/01/the-big-lie-of-strategic-planning**

[38] **Buller, J. L. (2015). *Change leadership in higher education: A practical guide to academic transformation.* Jossey-Bass. https://doi.org/10.1002/9781119210825**

[39] **George, B., Desmidt, S., Cools, E., & Prinzie, A. (2018). Cognitive styles, user acceptance and commitment to strategic plans in public organisations: An empirical analysis. *Public Management Review, 20*(3), 340–359. https://doi.org/10.1080/14719037.2017.1285112**

considered. Among the already identified risks that do not yet have high-quality solutions, we can note those inherent in AI:

- the risk of data disclosure: if the model contains confidential information, even filters do not guarantee that external users will not be able to access it;
- difficulty in assessing data reliability: the more diverse the training data, the more difficult it is to guarantee the correctness of the generated result, which is unacceptable when using AI in critical areas;
- the risk of biased decisions: AI can be biased towards certain groups of people or organisations, which can lead to unfair decisions;
- risk of lack of transparency: the use of AI may lead to a less transparent and understandable decision-making process for citizens, which may lead to distrust of government agencies;
- "AI hallucinations": artificial intelligence can produce information that has no factual support, independently generating non-existent arguments;
- instability of goal setting: self-learning AI models can arbitrarily redefine goals.

The development of integrated virtual platforms raises strategic, global issues of privacy, competition and taxation[40, 41]. Strategic planning and forecasting require further development based on digital and information technologies.

6. CONCLUSION

The introduction and involvement of the latest technologies in the system and process of public administration, especially in strategic planning in public administration, is not only impossible to refuse today, but such re-equipment has already been introduced in many countries of the world by orders of the first persons and provided for by law. Strategic planning and forecasting require further development based on digital and information technologies. The growth of information explains this need, the complexity of algorithms for calculating and interpreting results, and the high requirements for the quality and accuracy of forecasts.

The digital transformation process significantly affects the available ways of solving strategic planning tasks. It changes their composition and content characteristics, requiring a coordinated improvement of the methodology and tools for managing the strategic development of socioeconomic systems of different levels and scales. The institutional conditions for ensuring the functioning of the public strategic planning system require adjusting to the growing pace and expanding the range of digital technologies at its various stages. The digital platform of public administration opens up the possibility of increasing the validity and coherence of projects being developed to correctly translate the requirements and characteristics of substantive

[40] **World Bank. (2016).** ***World development report 2016: Digital dividends.*** https://www.worldbank.org/en/publication/wdr2016

[41] **World Bank. (2019).** ***World development report 2019: The changing nature of work.*** https://www.worldbank.org/en/publication/wdr2019

formulations of strategic planning tasks into the parameters of the electronic format for presenting a set of planning decisions being developed in the form of a coordinated ensemble by planning areas and a cascade by levels of management. Forecasting, goal setting, and national development programming are most affected by digital transformation, which requires further development of applied mathematical methods and analytical tools to support the solution of relevant tasks in the public administration system.

The role of digital strategic planning in public administration is determined by its enabling advantages:

- optimise public administration functions through the active use of digital technologies, including artificial intelligence;
- Ensure the implementation of the principle of balance in strategic planning documents by processing an extensive array of data (documents and indicators);
- to have a positive impact on the socioeconomic development of the country and its regions, to increase their sustainability by reducing the time required to make management decisions;
- adequately respond to and timely amend existing regulatory documents;
- monitor the implementation of national and regional programmes and plans as part of the implementation of the long-term social and economic development of the country and its regions;
- to increase the country's competitiveness on the global stage.

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