

# The Management of Business-Processes Strategic Sectors of Economy on Digital Transformation Conditions

Liliana Horal<sup>1</sup> Svitlana Korol<sup>1</sup> Mykola Havrylenko<sup>2</sup> Inesa Khvostina<sup>1,\*</sup> Vira Shyiko<sup>1</sup>

<sup>1</sup> *Ivano-Frankivsk National Technical University of Oil and Gas, Ivano-Frankivsk, Ukraine*

<sup>2</sup> *JOINT "Ukrtransnafta"*

\*Corresponding authors. Email: [inesa.hvostina@gmail.com](mailto:inesa.hvostina@gmail.com)

## ABSTRACT

This paper investigates the issues of the management improvement of business-processes on conditions of digital transformation. Based on studies of domestic and foreign scientists, it was established that the intensive process of digitization of the economy generates the emergence of new digital technologies and solutions, the specificity of their impact on business models of enterprises needs additional scientific study. Generalized conceptual diagram of the system modeling process is proposed. It has been found that digital transformation has led to changes in the business process management of enterprises, which have been driven by improved efficiency and manageability of operations, and have become a challenge oriented to the experience of successful global companies. A business process model was built "as is", then a model "to be" be based on them modelling the digitized business process network of JSC Ukrtransnafta, which was carried out using BPMN Visio 2010 Premium. It is determined that the efficiency of functioning of the modern state is largely determined by the speed and quality of decision making. This is not possible without digitization in the new paradigm of digital transformation. It allows not only to digitize the data, but also to improve internal discipline and speed up the decision-making process.

**Keywords:** *business-processes, digital transformation, business - process modelling, strategic*

## 1. INTRODUCTION

The modern economy is on the verge of major transformations and profound transformational processes in the digital sphere. Active development of digital and information technologies has formed a qualitatively new market - the market of information services, which unites a large segment of consumers. Individuals, employees, business representatives active in this market are focused on optimization of business processes, improving the productivity of companies, improving the experience of market interaction on the basis of large amounts of relevant information constant use. In a new digital economy, demand and forms of consumption are changing. Leading experts estimate that more than 60% of the world's corporations are already developing their own digital transformation strategy, which aims at simultaneously taking into account technological changes and features of market consumption. [2]. The main feature of digitization is to create conditions for a more comfortable and efficient interaction between business and consumers. In the context of the national economy, issues of digitization become relevant and require thorough research. Particularly noteworthy are the procedures for creating effective business process management systems focused on market trends in a single information space.

With the rapid development of information technology and globalization transformations, the business environment is undergoing dynamic changes. Digitization is a catalyst for innovative development, technological change has led to opportunities such as flexibility, reactivity and individualisation of products, but new obstacles have emerged, such as rapid technological transformations, high levels of complexity, changing customer preferences and regulatory requirements. Digitalization is causing structural change in industries, and its impact is diverse, and the question arises about the impact of this process on the business model.

## 2. LITERATURE REVIEW

The impact of digitalisation and digital technology on business processes and business models has been addressed by many scholars. Various aspects of this issue have been explored by prominent scientists and economists, among whom significant contributions have been made by Harry Bouwman, Shahrokh Nikou, Francisco J. Molina-Castillo, Mark de Reuver [1], David Eder, Christoph Buck [2], Shalmo D., Christopher A. Williams, Luke Boardman [3], Michael Rachinger, Romana Rauter, Christiana Müller, Wolfgang Vorraber, Eva Schirgi [4], Dr John Stark [5], Omar A El Sawy, Francis Pereira [6], Daniel R. A. Schallmo, Christopher A.

Williams [7], Christian Dörner, Fahri Yetim, Volkmar Pipek, Volker Wulf [8], Chunguang Bai, Joseph Sarkis [9], Marcus Fischera, Florian Imgrunda, Christian Janiescha, Axel Winkelmann [10], Liliana Horal, Vira Shyiko [11], Svitlana Korol [12], Inesa Khvostina [13].

However, the intensive process of the economy digitalization generates the emergence of new digital technologies and solutions, the specificity of their impact on business models of enterprises requires additional scientific study, which makes the topic of research relevant.

The authors brief book «Business Modelling in the Dynamic Digital Space An Ecosystem Approach» bring together both research and practice, guide the design of new digital business models in a concrete manner while also providing real case study examples, provide strategic roadmaps for enterprises in the digital world. Propose a tentative framework enabling enterprises to analyze and plan for the changes brought about by these ‘game changers,’ their term for forces that induce fundamental changes in the environment [6].

The authors Daniel R. A. Schallmo, Christopher A. Williams in their book [7] reveals how to digitally transform your business model and compete in today’s economy. It presents a roadmap consisting of five phases; Digital Reality, Digital Ambition, Digital Potential, Digital Fit, and Digital Implementation, each with step-by-step instructions as well as innovative activities and tools. Authors offer a clear road map for quick digitalization of businesses, outlines best-practices of successful real-world digital business models, provide an overview of innovation activities and tools [7].

Authors [8] present new business process modeling environment, called SiSO, that enables business process experts to model and adapt business processes. SiSO enhances the descriptions of services that are provided by Service-Oriented Architectures. These enhanced descriptions focus on organizational-specific information, which makes it easier for business process experts to understand the capabilities of services in their organizational context. The information includes descriptions of services’ functions, ratings, and keywords. SiSO’s graphical user interface employs the box-and-wire UI design technique to enable business process experts to model business processes in the context of Enterprise Resource Planning systems. SiSO was qualitatively evaluated with six employees of three different companies and found useful in two application fields: (a) the visualization and automation of business processes and (b) the creation of calculations using data from different systems and sources. This enabling business process experts to create individual business processes is an important challenge for the design of future Enterprise Resource Planning systems [8].

Chunguang Bai, Joseph Sarkis [9] research show that as many as 60–80% of BPM initiatives are unsuccessful. This study provides a methodology to evaluate BPM implementation critical success factors (CSFs) that can aid project managers make proper BPM investment strategies. Through a review of the literature, eight CSFs

for the successful implementation of BPM are identified. To help advance research on the implementation of BPM, this paper uses multi-site field study data with a novel grey-based DEMATEL (the decision making trial and evaluation laboratory) approach to visualize the structure of complicated causal relationships between these CSFs and obtain the influence level of these factors. The field study data uses three Chinese manufacturers as the setting. The four most important factors found in the field study, from amongst the identified CSFs, include Strategic alignment, Top management support, Project management and a Collaborative environment. Authors also found a number of direct and indirect relationships amongst the CSF factors [9].

Authors in their paper [10] examine how five companies use business process management (BPM) to implement digital transformation. They perform a qualitative interview study, and analyze the capabilities of BPM based on six requirements of digital transformation. Thereby, they carve out 17 recommendations, which must be adapted according to companies’ meta objectives. They derive three strategy archetypes to serve as implementation blueprints [10].

Thus, the review of literature sources related to the problems of digitalization and business modeling indicate the need to adapt the business processes of enterprises to the conditions of digitalization. Next, a visualization of the business processes of one of the strategically important enterprises will be offered.

### **3. APPLICATION, ANALYSIS AND DISCUSSIONS**

The purpose of the article is to simulate business processes in terms of digitization for an industrial enterprise. A scientific novelty is the proposed model of a digitized network of business processes.

The above indicates that effective management of business processes is made possible by adapting to the changes caused by transformation. Today, the global trend of digitization is entering an active phase of its development, driven by the new paradigm of digital transformation. It has become the prerogative of changes in the activities of enterprises, institutions and organizations. At the same time, it is the global systemic challenges that have given impetus to its mass development in state programs and strategies of enterprises. The practical plane for resolving these issues in the domestic space is rapidly updating. Digitization activates many changes that need to be addressed promptly through systemic solutions that affect both consumers and business organizations.

The most important advantage of using information technology for the consumer is convenience and time saving, as he has the opportunity to choose the service independently, to calculate its cost, to make payment in any convenient way from the comfort of home. Digitization reduces the level of influence on the consumer, that is, the absence of the need for direct

communication with employees of the company, reduces the impact on him emotional and rational factors of persuasion.

Therefore, in the context of a new economy, with fierce competition, rapid aging of technologies, professions, ideas, penetration of the Internet into all parts of the economy, digitization has taken on a new level of importance for business organizations. To support the competitiveness of the enterprise, enterprises need to use the possibility of digitization in all possible ways and forms: customer experience; partnership and collaboration; working with data; introduction of innovations; HR strategy and culture; value management and more [14].

Under the influence of digital transformation, business organizations are reviewing their business processes to improve their efficiency. Before processes can be refined or refined, the organization must first determine what the company does, who is responsible for it, at what point the process should be completed and how the success of the business process can be determined. This chain is a key element in the road to digitization, leading to process improvements and effective quality management. Business processes are the key to the success of every business organization. They not only demonstrate the result of performing all kinds of business functions, they also allow different parts of the organization to work together and interact with suppliers and customers. Such interaction is characterized by the flexibility, efficiency and agility of business processes.

Digitization has led to a better management of business processes by aligning goals and processes as the business develops. Many organizations have digitized to help them identify the steps needed to accomplish a business task, comparing these definitions with existing processes, and then streamlining or refining these processes to make the steps more effective. This process leads to the dynamic development of business organizations, which ensures the constant development of goals and business processes. This indicates that business process management is characterized by constant practice rather than a one-off improvement of business processes themselves.

The domestic space indicates that digitization initially had only indirect influence on business process management, as it was highly specialized. In particular, in Ukraine the digitalization project was launched in 2015 at the World Economic Forum. However, it covered only sectors of the economy, such as consumer goods, electricity, automotive, healthcare, media and logistics. Subsequently, over the next two years, it expanded its focus as it expanded to include: insurance, aviation, hospitality, professional services and telecommunications, oil and gas, chemical and mining. Single Market Strategy, a roadmap to ensure that the full potential of the Digital Single Market is unveiled as one of the EU's ten policy priorities, presented by the EU Commission in 2015; aimed at removing barriers, increasing trust in online operations, reducing administrative burdens, and more.

Since last year, domestic digitalization benchmarks have intensified, in particular since September 9, 2019 the Ministry of Digital Transformation of Ukraine, which is

responsible for the formation and implementation of state policy in the field of digitization, open data, national electronic information resources, and interoperability, has been launched. introduction of electronic services and development of digital literacy [15]. Also within the competence of the newly established body is the development of broadband access to the Internet, telecommunications networks and the IT industry.

In view of the aforementioned in the domestic arena, the main directions outlined by the European Commission in the integrated programming document "A Single Digital Market for Europe" were highlighted, in particular:

- Better Internet access for consumers and businesses;
- creating the right conditions for regulating advanced digital networks;
- building the digital economy through investment, interoperability and standardization.

The ministry's ambitious goals indicate that, with intensive digitization by 2024, it will be possible to: 100% transfer all public services to citizens and businesses online; provide 95% of transport infrastructure, settlements and their social facilities with high-speed Internet access; teach 6 million Ukrainians digital skills; to increase the share of IT in the GDP of the country to 10% [15]. Given the list of services that the Ministry of Digital Transformation and the Committee on Digital Transformation are providing and will provide in the near future, the strategic goals are quite realistic. Strategic types of public online services include: e-Health, launch of Action service, e-cabinet, Mobile app, eBaby, passport together with IDN, child registration online, e-Pensions, SmartID, MobileID, digital citizenship certificates, state without certificates, e-Residence, trembit, developer's office, bank account for online business, e-Elections, e-Census, ID-card with electronic signature, automation of CNAP's work, branding of service Action.

According to the report of the Ukrainian Institute of the Future "Ukraine 2030E - a country with advanced digital economy" two scenarios of Ukraine's digital economy development can be distinguished. In particular, inertia (evolutionary) and target (forced) scenarios should be distinguished depending on the assessment of the criticality and the need for rapid and profound changes in the traditional economic environment. [16].

If the Ukrainian economy adheres to the first scenario, it will remain ineffective, as labor migration will take place, highly skilled professionals will be disabled in jobs, and products will be uncompetitive.

The second scenario is closer to the strategic guidelines of the Ministry and the Committee on Digital Transformation, since it envisages the transition to digitization in 3-5 years. Under such conditions, Ukraine will become a European leader in the field of innovation and new technologies by 2030E, will become an intellectual hub, which will create the most attractive conditions for the development of people's potential in the region[15; 16]. If we present the results of the forced scenario in figures, by 2030E: 65% will represent the share of the digital economy in the total GDP of Ukraine; 99.9%

of homeowners will have broadband Internet access; will be 100% coverage of the territory of Ukraine 4G-5G; 99% of all motorways and railways and 95% of the countryside will be covered by mobile Internet technology; 99.9% of citizens will have digital identification (citizen-card, Mobile ID) and technical capabilities to use trust services and more.

In the context of digitization, Dr. Tis Petersen (Senior Advisor, Bertelsmann Stiftung) draws attention to natural monopolies. His view is that the creation of market power and monopolies in the digital economy further contributes to the fact that companies can complicate the switch to another provider by increasing costs, creating a blocking effect [17]. In many cases, high switching costs prevent customers from switching to the same product that costs less. This may mean that competitors cannot establish themselves, even if they have better products at better prices. At the same time, Tis Petersen identifies at least four reasons for pointing out that monopolies are an economic and social problem:

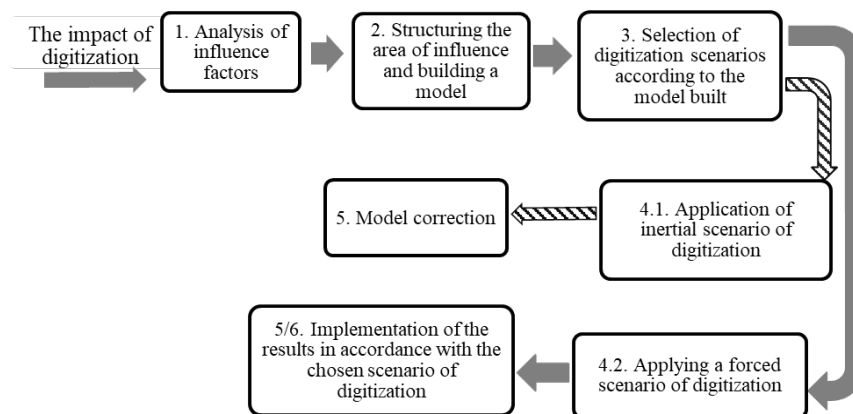
- Monopolies demand higher prices because they have no competition. Higher prices reduce the purchasing power of the consumer and, therefore, reduce the opportunity for consumption;
- A monopolist, even as a sole buyer, has a market power with which he can lower prices and wages. There is evidence that firms such as Google, Apple, Amazon, Facebook and Uber are contributing to lowering or increasing the wage of [18];
- without competition, a monopolist do not needs to improve the quality of products and reduce the prices of products due to technological advances. The central advantage of a market economy for consumers - improving the supply of products at lower prices - does not arise;

- economic power can become a political force. Superstar companies play an important role for both employers and taxpayers. This increases the likelihood that policy makers will listen to these companies and their partial interests.

Among the subjects of natural monopolies that are subject to digitalization are the majority of the companies of the Ukraine Naftogaz, including JSC Ukrtransnafta. It is the operator of the oil transportation system of Ukraine, the strategic directions of which are reduced to:

- increasing the volume of oil transportation by main oil pipelines;
- ensuring reliable and uninterrupted transportation of oil to both Ukrainian oil refineries and transit to European consumers;
- diversification of sources and routes of oil supply to Ukraine and its transit through the territory of Ukraine in order to enhance the energy security of the state;
- compliance with the highest standards of quality of oil transportation services throughout Ukraine;
- ensuring the reliable functioning and comprehensive development of the national oil transportation system through the implementation of promising investment projects [19].

The digital transformation has led to changes in the management of its business processes, which have been driven by the increase of efficiency and control over the results of Ukrtransnafta JSC activity, as well as being a challenge oriented to the experience of successful world oil and gas companies. In this case, the main principle of building analytical management of business processes under the influence of transformational changes was systematic. Generally, the process of system modeling in the digital space can be represented in the form of interrelated stages, each of which performs certain actions aimed at the construction and subsequent use of information-logical models of the system (Fig.1).



**Figure 1** Generalized conceptual diagram of system modeling process with element of digitization

A characteristic feature of such digitized modeling is the iterative nature, which, in fact, reflects the modern requirements for the analysis and design of complex systems of analytical management of business processes.

Once again, the impact of digitization indicates that its use is of a systemic nature rather than a one-off implementation. Moreover, the specific content of each of the steps presented in Fig. 1 depends on the specific

features of the tasks that take place in a specific subject area. And each individual cycle of the process is initiated by the stage of the analysis of the factors of influence and ends with the implementation of the results in the chosen scenario of development, which is the manifestation of digitization.

As a result of the changes introduced, the company management model became more effective, compared to the one before. Therefore, the model was built «AS IS» oil pumping station of the JSC Ukrtransnafta branch office (Fig. 2). Then a project of optimization of organizational structure and transition to a grading system of remuneration was started. Within the framework of this task, the company made global changes that affected both the management system of JSC Ukrtransnafta as a whole and the redistribution of functions of individual employees. The prerogative became diagnostics and

analysis of the current organizational structure oil pumping station of JSC Ukrtransnafta branch office, organization of positions, distribution of responsibility for processes in the current operating activity, structure of remuneration (remuneration) in all positions of the company.. As well as the main priority strategic goals and operational objectives were formulated [20]. Therefore, the model was built «TO BE» oil pumping station of the JSC Ukrtransnafta branch office through the prism of digitization (Fig. 3).

As a result of the organizational structure analysis, the main top-level business processes were identified and the basic functional directions (19 directions of the company (main and auxiliary ones) were determined, which formed the basis for the formation of a new management model and the formation of the Ukrtransnafta JSC target functional structure.

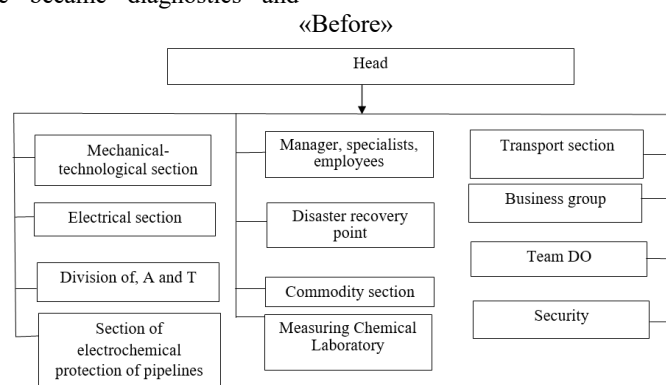


Figure 2 The model «AS IS» oil pumping station of the JSC Ukrtransnafta branch office

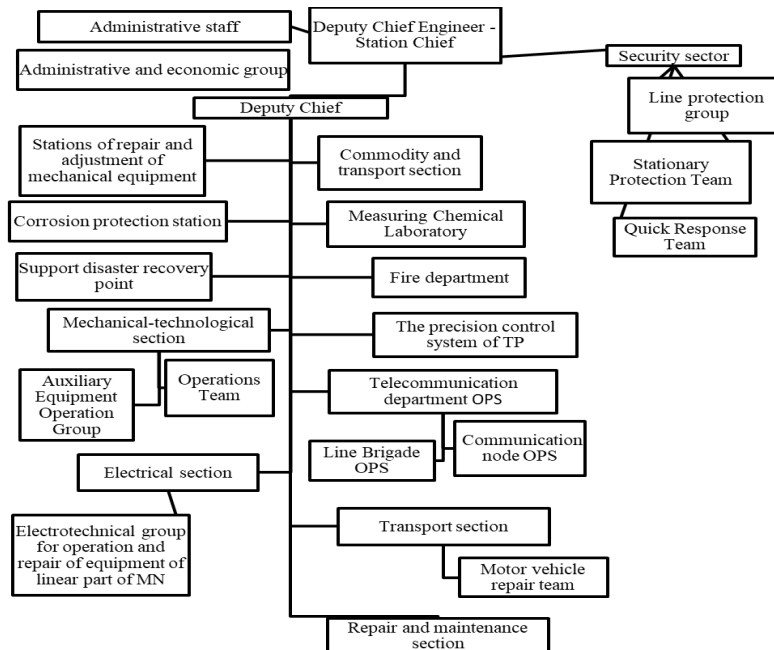


Figure 3 The model «TO BE» oil pumping station of the JSC Ukrtransnafta branch office through the prism of digitization

According to the results of the work, the following steps of the project of transition to the grading system of remuneration, modeling of business processes and optimization of the organizational structure in accordance with the strategic and operational goals of JSC Ukrtransnafta were realized:

- modeling of detailed business processes under the target organizational structure of the company and formation of a complete catalog of business processes;
- analysis of areas of responsibility for processes within the company and distribution of responsibilities in accordance with the new roles of positions in the organizational structure;

- preparation of a consolidated directory of job descriptions in accordance with the target organizational structure;

- building key performance indicators for each of the company posts;

- study the involvement of company staff in order to improve business efficiency and financial results.

This, in turn, made it possible to model the digitized business process network of JSC Ukrtransnafta, which was implemented using BPMN blockchains in Visio 2010 Premium (Fig. 4).

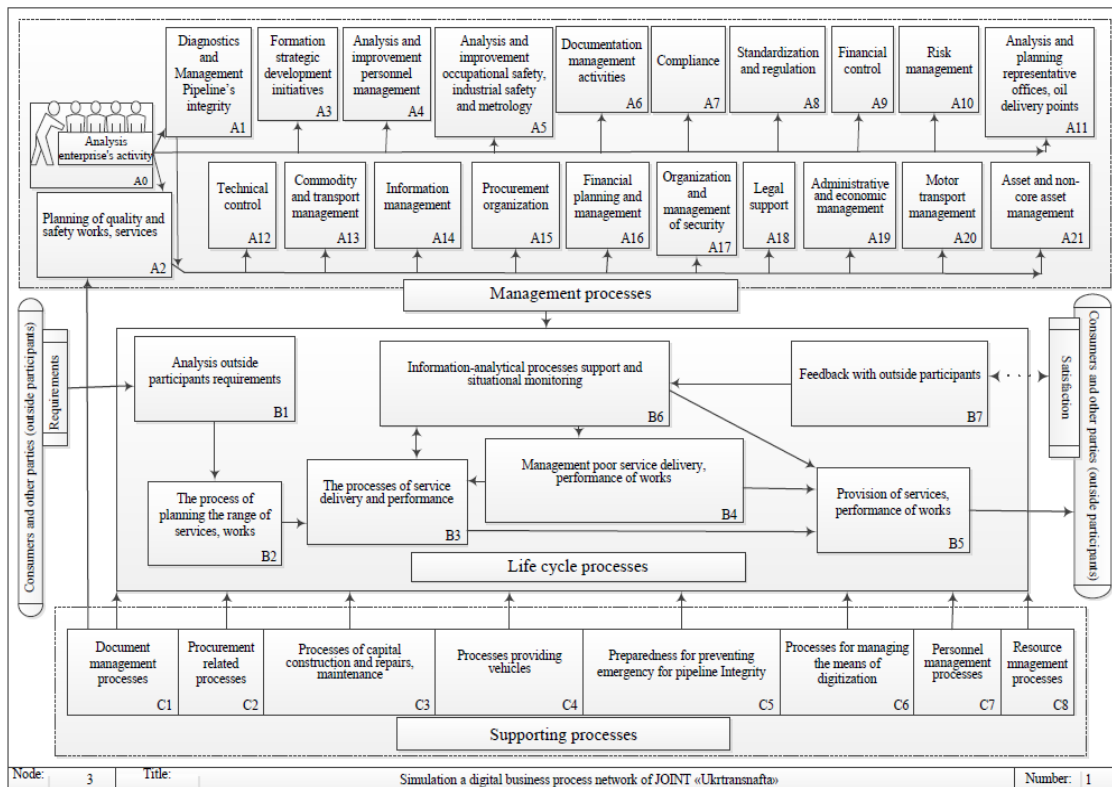


Figure 4 Modeling of a digitized business process network of JSC Ukrtransnafta

4. CONCLUSION

Thus, as practice shows, the efficiency of the functioning of the modern state is largely determined by the speed and quality of decision making. This is not possible without digitization in the new paradigm of digital transformation. It allows not only to digitize the data, but also to improve internal discipline and speed up the decision-making process. Therefore, almost all economists agree that digital technologies will become increasingly important in the future for manufacturing processes. Therefore, it can be assumed that production processes will become more capital and technological over time - not only in developed economies, but throughout the world. Considering the

requests and needs of consumers, we consider it advisable to provide a list of measures that should be included in the general plan for further digitization in the monopoly market: to create a personal office of the client on the site with the ability to track all the information he needs; introduce a discount system for online customers; create contextual advertising, search engine optimization, virtual communities, interactive sales, Internet PR; register companies on social networks: Facebook, Instagram, Telegram, Twitter and buy advertising on these networks; improve the design and operation of the company website. Therefore, the digitization of one's own economy must become a prerequisite for securing and enhancing the well-being of the country.

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