

# Prerequisites for Process Management Implementation in the Public Administration of Ukraine

Svitlana Khadzhyradieva<sup>1,\*</sup>, Tatyana Docsenko<sup>1</sup>, Maya Sitsinska<sup>2</sup>, Yurii Baiun<sup>1</sup> and Yuliia Pukir<sup>1</sup>

<sup>1</sup>*Department of Public Administration and Public Service, National Academy for Public Administration under the President of Ukraine, Kyiv, Ukraine*

<sup>2</sup>*Department for the Coordination of Scientific Events, International Cooperation and Grant Activities, Khmelnytskyi University of Management and Law, Khmelnytskyi, Ukraine*

**Abstract:** The main objective of the study is to analyse the prerequisites for the implementation of process management in public administration of Ukraine. In the process of identifying the presence of certain prerequisites in modern Ukrainian realities, methods of analysis of economic statistics and international indices that determine the level of technological and economic development of the country, as well as readiness to use information and communication technologies have been used. It has been determined that the evolution of management systems is derived from the development of managed objects. Therefore, the development of technologies as a way to transform matter, energy and information is the main determinant of the quality characteristics of management systems. It has been proved that given the global openness of the national economy and in a situation of insufficient technological level, there are opportunities for catch-up development in Ukraine, based on the introduction of digitalization technologies, which are used mainly in the sphere of services – financial, educational, public, etc. As a result, the introduction of information technologies will facilitate the transition to new rules for companies, organizations and government agencies. Taking this into account, there is an urgent opportunity in Ukraine to introduce process management tools and improve the efficiency of public administration and local self-government systems. However, changing the management system, in addition to process modelling and optimization, will require the transformation of cognitive models of civil servants as a sufficient condition for the effectiveness of the implemented system.

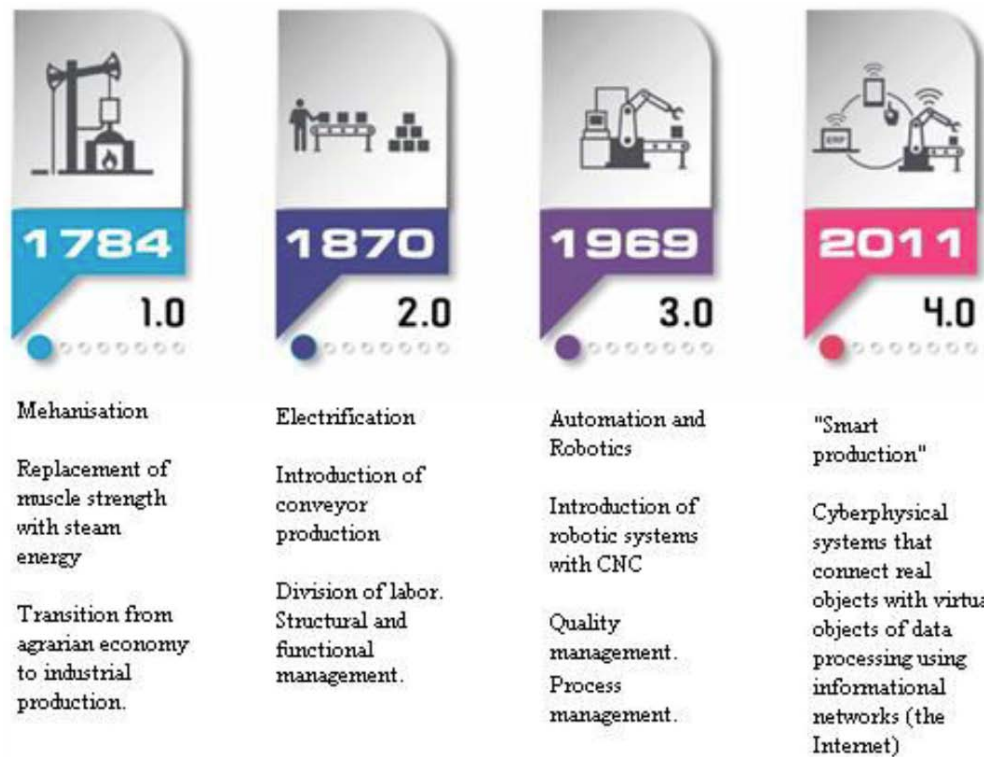
**Keywords:** Public administration, management system, technological structure, industrial revolution, digitalization.

## INTRODUCTION

The main task of the government systems of developed countries in the modern world, characterised by climate change, the slowdown of the global economy, the dysfunction of international security institutions and, as a consequence, increasing social tensions, is to increase the effectiveness of their functioning. Reducing existing resources while increasing the complexity of today's challenges requires finding more effective ways of governance, ensuring its flexibility and accuracy in directing managerial influences. These tasks determine the relevance and feasibility of implementing state-of-the-art management technologies that have been tested in the economic and/or military spheres in order to increase the effectiveness of public administration. However, the implementation of modern management systems in the practice of public administration and local self-government is not only a consequence of the exercise of political will, but also depends on certain prerequisites that are formed in the process of socio-economic development. These prerequisites require substantiation of their essence and analysis of their presence in modern Ukrainian realities.

Management theory has defined that the evolution of control systems is derived from the development of managed objects. This pattern was formed by R. Ashby when he defined the principle according to which “the diversity of the control system must be at least the diversity of the control object”. In other words, to ensure effective management, it is necessary to ensure that every possible state of the object of management has appropriate managerial influence, that it is possible to use management influence depending on the state, and that the choice of that management influence corresponding to the state of a management object (Anfilatov *et al.* 2002). The complexity of systems whose functions are to produce goods and services lies in the level of technology used to transform matter, energy, information. It is the development of technology that is the main determinant of the quality characteristics of management systems. Therefore, the level of technology development determines the possibilities and the necessity to move to more effective ways of organising a management system. Since the development of technology is characterised by both evolutionary changes and revolutionary leaps, the development of control systems takes place, respectively, or co-evolutionarily.

\*Address correspondence to this author at the National Academy for Public Administration under the President of Ukraine, Kyiv, Ukraine; Tel: +38044 4812172; E-mail: khadzhyradieva5333-2@uoel.uk



**Figure 1:** The four industrial revolutions (Schwab 2018).

To date, there are four industrial revolutions that have identified the qualitative characteristics of technological development (Figure 1).

The fourth industrial revolution is a new era in the development of mankind, characterised by the blurring of the boundaries between physical, digital and biological technologies. The technologies in question include artificial intelligence, the Internet of Things, unmanned transportation, 3D printing, nanotechnology, biotechnology, quantum computers. The revolution will cause systemic change. They will touch upon all spheres of business, society, politics and require new forms of government and private sector organisation (Schwab 2018). Industry 4.0, or the Fourth Industrial Revolution, envisages the full digitalisation of all physical assets of an enterprise and their integration into a single ecosystem. At the present stage of development, the most developed companies in the world are searching for the optimal management system, which corresponds to the technologies of the Fourth Industrial Revolution.

In doing so, when moving from Industry 2.0. to Industry 3.0, process management emerged, characterising the transition from functional management to process management, which is currently the most adequate management system for most modern companies. Therefore, process

management is a management system used in the period of Industry 3.0 development, which meets the following characteristics: consideration of activities as a hierarchy of processes, implementation in the management structure of managers and process owners, orientation of management to the final measurable result, expressed in terms of process efficiency.

In this process management is a methodology for managing all types of processes, which provides for the possibility of their design, improvement to the level of maturity and, if necessary, redesign or re-engineering. Yes, Business Process Management (BPM) technologies can be applied both in the process of implementing a unique project and in the form of cyclical standard processes (i.e. in the process of functioning). Management systems in the public sector, as a rule, inherit management technologies created mainly in the economy, sometimes – in the military sphere, the effectiveness of which is defined and proven (Ponomarenko *et al.* 2014; Harrington *et al.* 2002). Based on this, the level of technological development of the national economy is a marker of the development of administrative systems, including in the field of public administration. Therefore, the purpose of the study is to analyze the prerequisites for implementing process management in public authorities in Ukraine.

## Characteristics of the Structure of Technological Paradigm of the Ukrainian Economy

The current system of public administration in Ukraine is characterised by the programmatic and targeted basis of planning and implementation of the formed strategy. However, if the management system at any level – from the central to the territorial community – formally uses the software-based framework and does not apply process management technology, the effectiveness of such a hike tends to zero, and is achieved partly and situationally due to the effectiveness of individual projects, based on the additive result. On the other hand, the implementation of business process management technologies has the potential to dramatically increase efficiency. Taking into account the dependence of the quality of the management system on the technological system, in order to determine the prerequisites for the implementation of process management in public authorities of Ukraine, it is advisable to determine the technological level of development of the national economy.

In Ukraine, at the time of the review, a commodity economy with a dominant export orientation was created, which functions through the exploitation of traditional factors of production. The main indicator of the effectiveness of the national economy (GDP per capita) in Ukraine is \$ 2 963.5 USA. The 10-year average GDP growth was fixed at 0.1% per year (Schwab 2019). According to the international benchmark, the Global Competitiveness Index, Ukraine scores 57 out of 100 (Figure 2).

As can be seen in Figure 2, low institutional failure (48 points out of 100) and low ability to innovate Ukrainian businesses (40 points out of 100) are the main factors behind the country's technological backwardness. A look at Ukraine through the prism of technological paradigm and analysis of the current state of the economy (Tsikhan 2005) shows that in the industrial production the 3rd technological paradigm dominates, and as a consequence, the lag of Ukraine from the leading countries of the world is at least 50 years, and in the financing of scientific and technical development – the 4th technological paradigm prevails, so it is possible to discuss the lag of the leading countries for at least 25 years.

The germs of the 5th and 6th paradigm indicate that Ukraine is a country in which the share of raw materials and agricultural products actually exceeds the share of high-tech products by several times in the structure of exports, and the contribution of Ukraine in the world trade in scientific and technical products does not exceed 0.1% (Table 1).

Thus, the structure of technological paradigm characterises the quality of the economic development model chosen by Ukraine. Therefore, based on the existing structure of technological paradigm of Ukrainian national economy and the harmonisation of paradigm periodisation with industrial revolutions (Industry 1.0-4.0), it is possible to determine the dominant type of control system specific to production systems.

It has previously been argued that the control system is derived from the complexity of the control

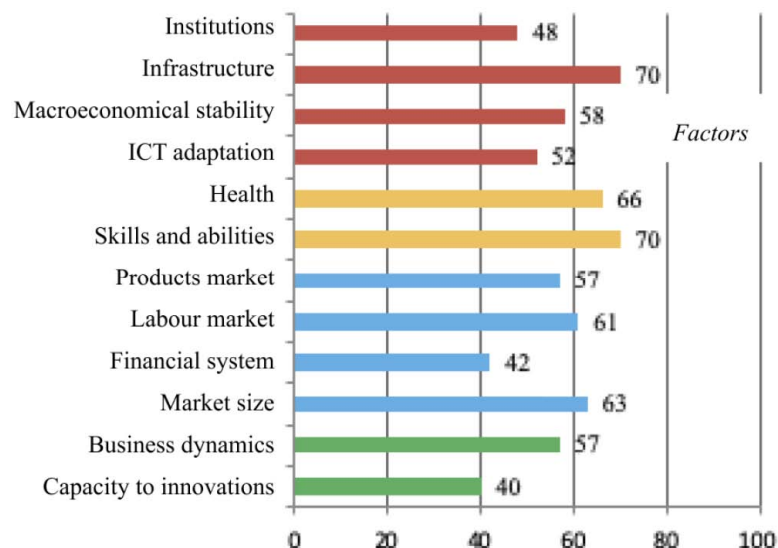


Figure 2: Competitiveness Index, Ukraine 2019 (Schwab 2019).

**Table 1: Technological Diversity of Ukrainian Economy**

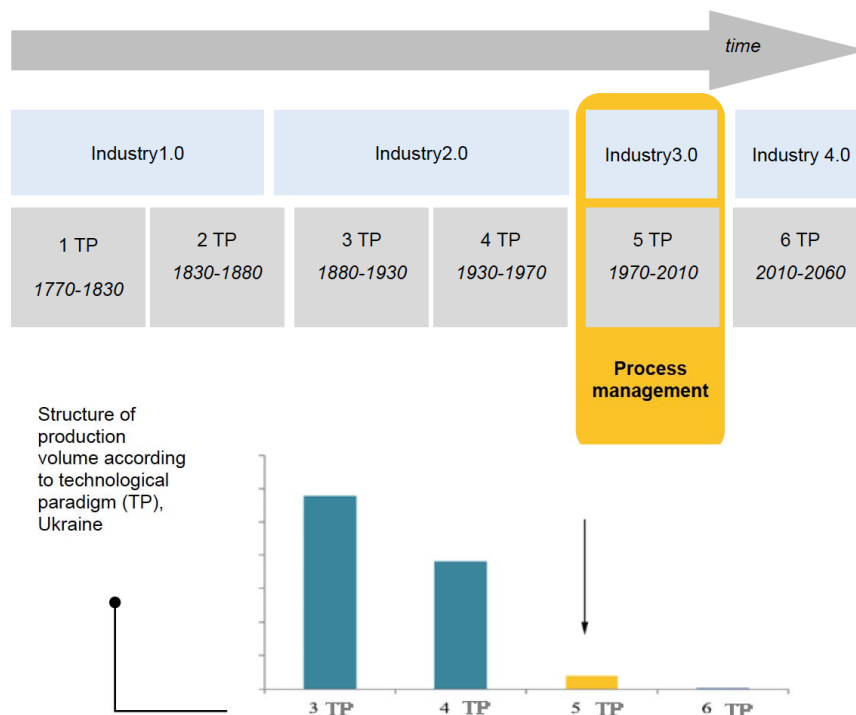
Indicators	Technological paradigm			
	III	IV	V	VI
Production volume	57.9%	38.0%	4.0%	0.1%
Financing of scientific development	6.0%	69.7%	23.0%	0.3%
Innovation costs	30.0%	60.0%	8.6%	0.4%
Investments	75.0%	20.0%	4.5%	0.5%
Capital cost for modernisation	83.0%	10.0%	6.1%	0.9%

object. Taking into account the structure of technological structures of the Ukrainian economy, it can be argued that the dominant type of management system, adequate to the level of technological development, is characterised by a structural and functional basis (Figure 3). Even in the presence of formally implemented quality systems and analytical part of process management, the vast majority of production systems operate in commodity markets, for which the problem of individualisation of consumption is not inherent.

It is important to note that the fifth technological paradigm is characterized by the transition from mass production inherent in the fourth paradigm to the individualisation of production and consumption, which requires greater flexibility and adaptability of organisations. The main branches of the fifth

technological paradigm are electronics and microelectronics, information technology, genetic engineering, software, telecommunications, space exploration. The humanitarian advantage associated with the development of the fifth technological paradigm is globalisation, speed of communication and movement.

The projection of the fifth technological paradigm on the national economy of Ukraine is conducted by global economic centres. It lies in the digitalisation possibilities arising from the introduction of foreign technologies of the fifth paradigm. The level of digitalisation of national economic systems is estimated using the Networked Readiness Index (NRI) proposed by the International Economic Forum in conjunction with the International School of Business “INSEAD”. The index reflects countries’ readiness to use ICT for



**Figure 3:** Time axis for periodisation of technological paradigms (TP) and industrial revolutions. System time for Ukraine.

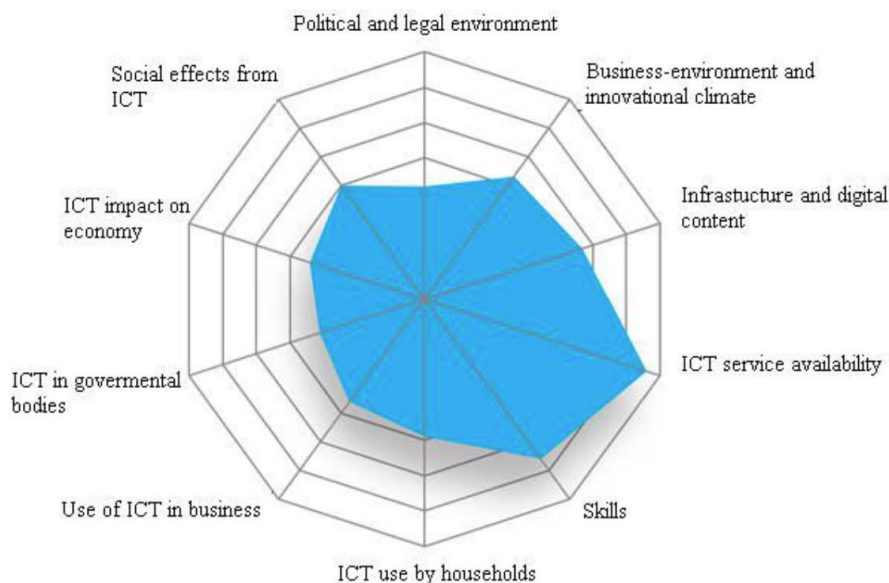


Figure 4: Networked Readiness Index: Ukraine, 2016 (The Global Information Technology Report 2016).

socio-economic development. For Ukraine according to 2016, the components of the index are as follows (Figure 4).

The impact of ICT on the economy (3.4 points) and the use of ICT in business (3.6 points) are determined, as shown earlier, by the low level of technological development of the national economy. It is important that with high availability of ICT services in Ukraine, the indicator of ICT usage in public administration is 3.1 points out of the 7 maximum possible and is the lowest of the sub-indices. Although the ICT skills of the population are estimated at 5.6 points. Therefore, it can be argued that there is a reserve for improving efficiency in the public administration through the use of ICT at different stages of government.

Some indicators of the index under consideration characterise the implementation of ICT in public and municipal government (Table 2). As Table 2 shows, the

success of the public administration system in promoting ICT has been rather mediocre.

It is worth noting that, given the global openness of the national economy and in a situation of insufficient technological level, there are opportunities for catch-up development based on the introduction of the technology of digitisation, which are used mainly in the sphere of services – financial, educational, state and others. As a result, the introduction of information technology facilitates the transition to the new rules of operation of companies, organisations and public institutions (Table 3).

**The Results of the Implementation of Digitalisation Technologies on the Example of Public Authorities**

In Ukraine, the process of digitalisation at the time of analysis led to local changes in the application of process management. This applies to: 1) central

Table 2: Selected Indicators of Networked Readiness Index

Indicator	Rating of Ukraine among 139 countries	Points (1-7)
Block 8: Use in Public Administration	114	3.1
8.01 The Importance of ICT for Government	122	3.1
8.02 Index of State Online Services,0-1 (maximum)	105	0.27
8.03 The Government’s success in promoting ICT	94	3.7
Block 10. Social effects of ICT	75	4.0
10.03 The Impact of ICT Use on the Effectiveness of Public and Municipal Governance	96	3.5

Source: based on The Global Information Technology Report (2016).

**Table 3: Influence of Information Technologies on Transition to New Rules of Companies Work**

Old rule	Technology	New rule
Information can appear at one time in one place	Distributed databases	Information can appear simultaneously in places where it is needed
Only experts can do the difficult work	Expert systems	The work of an expert can be performed by a specialist in general issues
It is necessary to choose between centralisation and decentralisation	Telecommunication networks	It is possible to use the benefits of centralization and decentralization at the same time
All decisions are made by managers	Decision support tools (database access, modelling tools, and so on)	Decision making becomes a part of every employee's job (hierarchical decision making)
An office is required to receive, store, search and transmit information	Wireless connection and laptops	Employees can send and receive information from where they are
Better contact with a potential buyer is personal contact	Interactive video disk	Better contact with a potential buyer is effective contact
To find an object, it is necessary to know where it is located	Automatic indexing and tracking	The objects inform themselves about their location
Work plans are reviewed and adjusted periodically	High-performance computers	Plans are reviewed and adjusted promptly as needed

Source: based on Ashman and Popov (1997).

government bodies (in particular, the State Tax Service); 2) state-owned enterprises (as an example, Ukrenergo); 3) optimisation of the structure of territorial administrations, work of Ministries and departments (current plans of the Government for the implementation of the project "State in a smartphone"). Let's look at these examples in more detail.

#### **Example 1. The State Tax Service**

The State Tax Service (STS) optimised business processes. According to the Concept of Operational Activity of the STS, the processes are grouped into operational and organisational-management blocks. According to the accepted classification, the operating unit includes the basic processes that ensure the actual results of the activities of the STS bodies. The processes of the organisational-management block ensure the activity of the basic processes. The processes of development of the management system are also separated: 1) introduction of risk management system; 2) introduction of quality management system; 3) improving the skills of the personnel (State fiscal service of Ukraine...2011).

As part of the Modernisation Project implementation, the development and implementation of an organisational structure model based on a process approach that focuses the activities of the structural unit on the process (e.g.: registration, processing of tax reporting and payments, payment of tax debt, tax audit or non-tax type) is envisaged. This approach enhances the quality of services provided to

taxpayers by providing: a "one-stop shop" principle; registration of all taxpayers (subject to the specifics of the taxpayer). In one structural unit, a single accounting system, effective fundraising and auditing, regardless of the type of taxes (State fiscal service of Ukraine...2011).

In addition, the process approach makes it possible to standardise the processes of STS activity more, to improve the information system, to simplify the organisation of work, in particular, in the preparation of internal and external reporting. The advantage is also that staff are able to specialise in different areas, using common approaches to administering different types of taxes and servicing different categories of payers. Therefore, the process approach aims to continuously improve the quality of services provided to taxpayers (State fiscal service of Ukraine...2011). Thanks to such optimisation, Ukraine has risen in the Paying Taxes Index in 10 years, substantially optimised the amount of tax and reduced the time spent to pay them (Table 4).

These indicators were achieved precisely through the business process reengineering. However, the tax rate, which is higher than the national average, remains high. This indicates deficiencies in the formation of business tax burden.

#### **Example 2. Ukrenergo NPC**

NPC "Ukrenergo" is an energy company with the functions of operational and technological management

**Table 4: Dynamics of the Paying Taxes Index for Ukraine**

Year	Total amount of tax	Time spent to pay taxes, (hours a year)	Full tax rate, (%)
Paying Taxes 2010	147	736.0	57.2
Paying Taxes 2020	5	327.5	45.2
The world in average, 2020	23.1	234	40.5

Source: based on Paying Taxes (2020).

of the Unified Energy System of Ukraine and transmission of electricity by backbone power grids from generation to regional power grids of power supply companies ("Oblenergo"). The Company consists of 8 energy systems, which covers the whole territory of Ukraine, and the team has more than 8 thousand employees (Standard of process management...2018).

NPC "Ukrenergo" is one of the few companies that has implemented process management standards. The standard of process management of NPC "Ukrenergo" (Standard of process management...2018) establishes requirements for activity management, defines tasks, means, procedures and distribution of responsibilities during its implementation in NPC "Ukrenergo". The purpose of the Standard is to increase the efficiency of the Company's activities by introducing a single, integrated mechanism of business process management, building a stable management model, adapted to external and internal factors of influence. The standard uses a process approach that includes a PDCA and thinking cycle based on risk and capability assessment according to the requirements of "ISO 9001: 2015 Quality Management System. Requirements":

- 1) Process approach – systematic definition and management of processes and their interactions to achieve the planned results in accordance with the quality policy and strategic directions of the Company's development.
- 2) The PDCA cycle enables the Company to ensure that its processes are adequately resourced and managed, and that opportunities for improvement are identified and implemented.
- 3) Risk-based thinking enables the Company to identify factors that may cause deviation of its processes from the planned results, for the protection mechanisms to reduce the negative impact, and to maximize the realization of opportunities when they occur (Standard of process management...2018).

As a result, the company demonstrates positive financial results and high-quality indicators.

### **Example 3. Optimisation as a Result of Digitalisation (the Project "State in a Smartphone")**

The change in power in Ukraine has led to changes in the country's development strategy, in particular in the direction of digitalisation. To fulfil this strategic direction, the Ministry of Digital Transformation of Ukraine was created. By 2024, the Ministry plans to make 100% public services available online, to bring the share of IT in the country's GDP to 10% and to involve 6 million Ukrainians in the digital skills development program. Thus, in December 2019, the Government of Ukraine introduced the mobile application "Action" ("State in a smartphone"). The first projects that will be in the smartphone – a driver's license, a technical passport for cars. Subsequently, it is planned to introduce electronic student, electronic retirement certificates. After that, the introduction of electronic registration, change of place of registration, receipt of a pension, etc., are planned.

In addition, in December, presented the "Cabinet of the Builder", when a citizen will be able to submit documents, notify the state that the construction began, in electronic format and without the participation of any official. There are also plans to launch an electronic passport in early 2020 (In 5 years, Ukraine may become the world's leader...2019). Also, in addition to the mobile application, a mobile portal with electronic services is planned – this is the opening of FOP, LLC, birth assistance and "e-baby". The government has an internal task – to get on the digitalisation and launch of four services a month, starting in the spring (In 5 years, Ukraine may become the world's leader...2019).

Regarding the optimisation of the activity of public administration structures, it is stated that it is planned to reduce the number of officials by 10%, the main savings are expected to be obtained through the use of IT tools, that is, modern databases that save time (Next year, the government will reduce...2019). In addition, the introduction of KPI (Key Performance Indicators) for

the activities of ODA executives was announced in 2020 (Prime Minister: Starting from 2020, we will introduce KPIs...2019). This fact testifies to the implementation of the tools of Performance Management, which is the nucleus of the New Public Management, as an approach to organising the activities of governmental institutions, which has proven effective in a number of economically developed countries.

However, the programmatic management framework requires changing the cognitive models of participants in the management process and the provision of administrative services in order to move from performing individual functions to participating in the achievement of goals within a given process (functioning and/or development). Thus, the implementation of process management within the framework of the program-based framework of the management system requires:

- 1) an analytical part, which consists in the design, improvement and reengineering of business processes (in this case, administrative processes);
- 2) a practical part, which is to ensure the activity of participants in accordance with the process model.

To ensure the activities of participants, it is necessary:

- 1) to form cognitive models that are adequate to the process implementation of the activity, which results in the understanding of the participants of the process of its essence, peculiarities of the process and ways of achieving the result, as well as a holistic vision of the implementation of organisation's mission in each individual process;
- 2) to teach the practitioners of functioning within the process organisation (which implies, among other things, the introduction of additional positions responsible for the execution of the process, the setting up of cross-functional communication and its establishment);
- 3) to develop an effective system of activity motivation (part of which is an assessment of the performance of processes implementation). A full-fledged start-up of a process management system is impossible without effective incentives

linked to the efficiency and effectiveness of the processes.

## CONCLUSIONS

Thus, in the process of determining the essence of the prerequisites for the implementation of management systems of a certain quality, it is substantiated that the evolution of management systems is derived from the development of managed objects. In particular, process management is a management system adequate to the task of high-tech industries of the fifth technological paradigm (or Industry 3.0), which meets the following characteristics: consideration of activities as a process hierarchy, implementation of management structure and process owners, orientation of management to the final measurable result, expressed in terms of process efficiency.

The problems and possibilities of implementation of process management in Ukraine have been analysed. It is proved that in the conditions of global openness of the national economy and in the situation of insufficiently high technological level, there are possibilities of catching up, based on the introduction of technology of digitalisation, which are used mainly in the sphere of services – financial, educational, state and others. As a result, the introduction of information technology facilitates the transition to the new rules of operation of companies, organizations and government agencies. Against this background, Ukraine has an urgent opportunity to implement process management tools and increase the efficiency of functioning of public administration and local self-government systems. However, changing the management system, in addition to process modelling and optimisation, will require the transformation of civil servants' cognitive models as a sufficient condition for the effectiveness of the system in place.

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