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FORMATION AN INFORMATION-ANALYTICAL SYSTEM FOR MONITORING THE ECONOMIC DEVELOPMENT OF TERRITORIES

KSZTAŁTOWANIE SYSTEMU INFORMACYJNO-ANALITYCZNEGO MONITOROWANIA ROZWOJU EKONOMICZNEGO OBSZARÓW

Abstract

The object of the study is to monitor the economic development of territories. As a result, a detailed analysis revealed the absence of a single action algorithm for diagnosing the economic development of territories. As a result of the analysis of the terminological apparatus, the essence of monitoring the economic development of territories is clarified, by which is meant the process of measuring, fixing, evaluating, controlling, analyzing and forecasting key characteristics based on information technologies and intended for current and strategic goals of managing the country's territory. The paper proposes a model for the formation of an information-analytical system for monitoring the economic development of territories, based on the use of IDEF0 functional modeling and includes a specific set of stages, each of which solves a set of tasks with an indication of mechanisms and tools. The practical implementation of a functional model for the formation of an information-analytical system for monitoring the economic development of territories will effectively organize the collection of information, objectively assess the dynamics of

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changes in the regions, and also forecast the development of economic processes in the country.

Keywords: economic development, monitoring of economic development, information and analytical system, functional model, management tools and mechanisms, analysis of economic development

Streszczenie

Obiektem badania jest monitorowanie rozwoju ekonomicznego obszarów. Po przeprowadzeniu dokładnej analizy nie ujawniono jedyne go algorytmu działań do diagnostyki rozwoju ekonomicznego obszarów. Po analizie aparatu terminologicznego sprecyzowano definicję monitorowania rozwoju ekonomicznego obszarów, pod którą rozumiemy proces wymiaru, ustalenia, oceny, kontroli, analizy i prognozy kluczowych cech opartych na technologiach informacyjnych służących do bieżących i strategicznych celów zarządzania terenem państwa. W pracy zaproponowano model kształtowania systemu informacyjno-analitycznego do monitorowania rozwoju ekonomicznego terenów, który polega na wykorzystaniu modelowania funkcjonalnego IDEF0 i zawiera pewną sekwencję etapów, tak by na każdym z tych etapów doszło do rozwiązywania kompleksu zadań z zaznaczeniem mechanizmów i narzędzi. Stosowanie w praktyce modelu funkcjonalnego kształtowania systemu informacyjno-analitycznego do monitorowania rozwoju ekonomicznego obszarów, pozwoli na skuteczną organizację zgromadzonych informacji, obiektywną ocenę dynamiki zmian w regionach, oraz prognozowanie rozwoju procesów ekonomicznych w państwie.

Słowa kluczowe: Słowa kluczowe: rozwój ekonomiczny, monitorowanie rozwoju ekonomicznego, system informacyjno-analityczny, model funkcjonalny, narzędzia i mechanizmy zarządzania, analiza rozwoju ekonomicznego.

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Statement of the problem in general outlook and its connection with important scientific and practical tasks.

The current stage of development of the economy of the country and regions necessitates the mobilization and effective use of all factors that ensure the competitive advantages of specific territorial entities and settlements, taking into account the specifics of their geographical location and the location of productive forces. The development of Ukrainian regions requires further structural changes while ensuring the global competitiveness of the country's

economy. Under these conditions, the effectiveness of socio-economic, institutional and innovation-investment strategies for the development of regions and the strengthening of the role of the Ukrainian state in the Eurasian geopolitical space largely depends on the identification and use of their competitive advantages. On the other hand, at the present stage of modernization of the system of public administration

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tion and local self-government, many attempts are being made to increase the efficiency and effectiveness of the management entities. It is obvious that without an analysis of the activity of power structures and the state of the economic environment under influence, it is difficult to speak of the availability of a workable mechanism

for information and analytical provision of preparation and decision-making on a wide range of issues in the field of public administration. That is why the development of a theoretical and methodical toolkit aimed at analyzing the economic development of territories is an urgent task of today's practice.

Analysis of latest research where the solution of the problem was initiated.

At the center of the work of foreign scientists, there are issues of regional policy and cross-border cooperation, the development of new development models in Central Europe (Bufon M. and Markelj V., 2010). The study of the peculiarities of the formation and functioning of regional development agencies is relevant (H. Halkier, 2012). So, the American scholars (Hugh D. and Wilson E., 2015) emphasize that local economic development research should not take place in a vacuum. In their work, an interesting study of influential subjects of economic development planning was conducted. French scientists (Marijnn Molema and Arno van der Zwet, 2017) in their work investigate the processes of socio-economic development on the territories of France, on a fairly large scale, which allows us to trace the temporal depth of territorial development. The work of scientists (Griškevičiene D. and Griškevičius A., 2004) is devoted to the development of public transport development strategy in the context of Lithuania's integration into the EU in order to improve the living standards of the population and improve socio-

economic conditions of existence. Scientists note that the integration of new territories into the existing transport system, as well as improving the quality of transport services, are impossible without special territorial planning methods.

There is a number of authors in Ukraine, whose works are aimed at improving the theoretical and methodological basis for the development of a system for managing the processes of socio-economic development of a region. (Гавкалова Н., 2016; Варналій З., 2005), management of the development of regional markets on the basis of the theory of convergence (Кизим М. and Раєвнева О., 2011), improvement of state regulation of socio-economic development of regions (Шумська Г. and Мельник В., 2016), research of transformation processes in Ukraine and its regions, provision of strategic management of organizational transformations under conditions of institutional changes (Гордієнко Л. and Вацьковські К., 2017, 2018), introduction of methodology of project management in the field of regional development (Золенко А., 2018).

Aims of paper. Methods.

The main goal of the paper is the methodical justification for designing an information-analytical system for monitoring the economic development of territories. To achieve the goal, the following tasks were

solved: development of a model for the formation of an informational and analytical system for the analysis of economic development of territories; substantiation of the

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main business processes of information-analytical system of monitoring the economic development of territories; definition of key indicators of economic development analysis of Ukrainian territories and comparison of their changes with Poland. In the process of research, it is envisaged to use general and special methods: analysis and synthesis - to clarify the nature of monitoring of eco-

nomical development of territories; formalization – to substantiate the elements of the model of formation of information-analytical system of monitoring the economic development of territories; logical generalization and comparison - to analyze the approaches to assess the level of economic development of a region; statistical analysis - to identify and justify the trends of global, national and regional changes.

Exposition of main material of research with complete substantiation of obtained scientific results. Discussion.

The economic development of the territory should be based on continuous monitoring of relevant processes of the national market. The application of monitoring procedures will help to ensure the objectivity, relevance and reliability of the data received, which, in turn, will allow timely and adequate response to certain changes in the subject being investigated. On the basis of a detailed study of the essence and features of monitoring of the economic development of territories and regions, it is determined that it is a process of continuous measurement, fixation, evaluation, control, analysis and forecast of key characteristics based on information technologies and aimed at current and strategic objectives of country's management (region) The structural and object content of any territory is, first of all, the set of parts of social, economic, administrative, natural resources, national-ethnic and another potential of the country. (Лексин В., 2009).

Therefore, in order to analyze all aspects of integrated diagnostics of the level of economic development of the territories, taking into account the complexity of obtaining the necessary information and preferential subjectivity, the model of formation of information-analytical system of monitoring of economic development of territories with the use of the methodology of functional modeling was proposed IDEF0.

Designing with the Business Process Modeling Tool AllFusion Process Modeler (BPwin) allows you to create a functional model that reflects the structure and functions of the system (Маклаков С., 2001). In the context of our study, it is possible to have more detailed decomposition and clear details of the process of formation of the information-analytical system for monitoring the economic development of territories. The context diagram of the business process model is shown in Fig. 1

Fig. 1 Model of formation of the information-analytical system of monitoring of economic development of territories

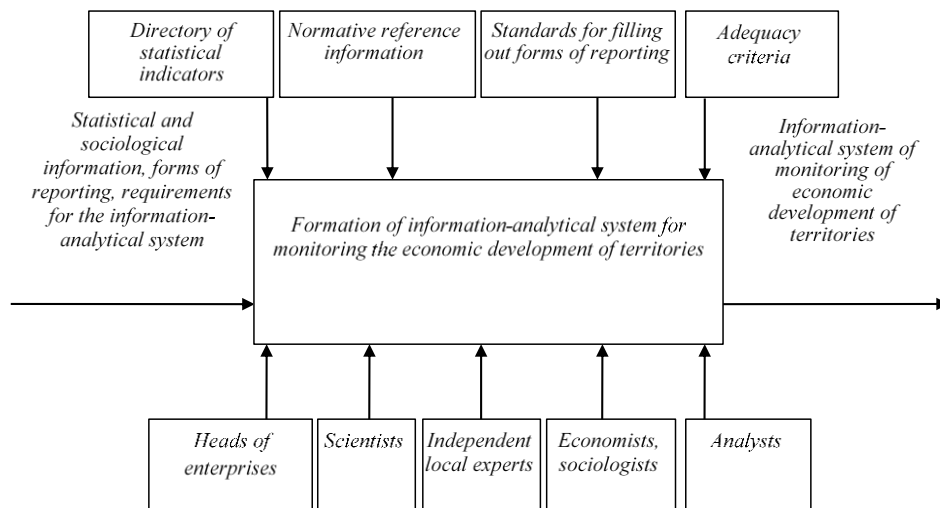
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Source: compiled by the authors.

According to Fig. 1 functional model for the formation of the information-analytical system for monitoring the economic development of territories transforms the input (statistical and sociological information, forms reporting, requirements to the information-analytical system) into the output (information-analytical system of monitoring of the economic development of territories) providing the constituents of management, namely a reference book on statistical indicators, normative background information, standards for filling in the forms of reporting, adequacy criteria and mechanisms through which participation of managers, scientists, economists and social scientists, analysts, independent local experts is realized.

Decomposition of the proposed functional model has allowed allocating the following processes: 1) creation of information monitoring equipment; 2) analysis of economic development of territories; 3) ensuring the storage of information; 4) dissemination of information received. It should be noted,

that the formation of information-analytical system for monitoring the economic development of territories pursues the following objectives: shortening of terms and improving the quality of development of statistical tools and instruments; shortening the timing of collecting primary statistical data from objects of statistical observation; increasing the share of statistical data stored in the integrated data repositories at the regional level; shortening of the terms of obtaining analytical information at the regional level; automation of interaction with external information systems on the basis of international standards.

In addition, the basis of the creation of this information-analytical system is the principles – the basic rules that reveal the effect of objective laws, which should be based on this formation. The following were included in the principles (Маклаков С., 2001; Inmon W., 2005):

the principle of modularity and reuse of functional IT elements, the observance of which will reduce the cost of developing a

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new system, expand the reuse of existing components and services, simplify the maintenance of the system being created; the principle of data centralization, the observance of which will reduce the amount of work on the development and implementation of the system;

the principle of the availability of information, the observance of which will allow not only to consider all databases as the only data warehouse but also to carry out centralized control over the quality of primary statistical information;

the principle of scalability, the observance of which will facilitate the approbation of design and software solutions;

the principle of centralizing the dissemination of statistical and analytical information, the observance of which means the need to create a website;

the principle of using the metadata system, the observance of which will contribute to improving the quality of formal information resources and their integration and will avoid further unreasonable costs when integrating information resources;

the principle of information security, the observance of which will ensure the security of confidential information;

the principle of centralization of planning, control, and process management, the observance of which will contribute to reducing the total cost of ownership of the information and analytical system and increase the adaptability of IT infrastructure.

An extremely important stage in monitoring the economic development of territories is the creation of appropriate information support. The purpose of this stage is to systematize the basic information in the context of formulation of the purpose of monitoring, the definition of monitoring objects, the formation of an expert group, the definition of monitoring time and development of the toolkit of monitoring procedures. It

should be noted that the appropriate organization of this stage depends on the reliability of data on the basis of which managerial decisions are made in the future. Determination of monitoring objects is a necessary step in monitoring procedure, which allows focussing on the subject of the research. The object of monitoring in our study is the level of economic development of territories.

The next step of this stage is the formation of an expert group that will allow more accurate and detailed monitoring procedures through the division of functional responsibilities between experts, which may include company executives, scientists, analysts, economists and sociologists, independent local experts, etc. collection and processing, development of tools and coverage of monitoring results. Determining the time monitoring is an important component of this phase. The most prevalent period is monitoring once every six months, which will allow management to react in a clear and timely manner to the changes that take place.

The most important and necessary step in monitoring the economic development of territories is the development of a toolkit of monitoring procedures. There can be such tools as the whole set of forms of statistic reporting; current standards and norms; questionnaires, google forms, etc.

To properly conduct monitoring, it is necessary to perform a number of tasks, one of which is the choice of system of indicators. It is determined that as a result of monitoring of phenomena and processes of social life one can obtain information and statistics that characterize economic development and are the basis for the research and analysis.

Periodic measurements of monitoring objects using regression analysis will determine the level of economic development of

the country, analyze weaknesses and identify the strengths of the regions that need to be taken into account at the next stage. It is precisely the implementation of corrective measures that will achieve the desired quality of processes and effective management results in the economic development of the territories.

Thus, in order to ensure the storage of the information received after monitoring the economic development of the territories, reports on its level and dynamics are formed, the necessity of corrective measures is determined. It should be noted that the results of monitoring by disseminating the information obtained will allow the following: to formulate the necessary information base for solving practical issues from the point of view of increasing the level of economic development; to carry out systematic monitoring of the implementation process of the proposed functional model.

Taking into account that the main process, which is analyzed in the subject area, is "the analysis of economic development of territories", it is further decided to detail this particular stage and to present the analytical component of the monitoring system. It is important to study the level of economic development of the country not only in the context of monitoring the key indicators but also in comparison with other developed countries. This will allow us to get a more

complete picture of the current state of the national economy. In particular, such an approach to analysis is necessary for the context of integration with the EU. Thus, Poland was chosen as the leading country in Europe to be compared with Ukraine (Table 1), explaining such a choice by the fact that both countries have the same structure of the population.

Comparing the key indicators of the economic development of both countries, it should be noted that Poland is characterized by moderate economic growth and, consequently, the positive dynamics of the indicators studied. In addition, it can be assumed that the biggest economic leap that motivates the development of the economy was made after Poland joined the EU.


It must be admitted that the dynamics and pace of the implementation of a new stage of economic reforms in Ukraine, the strategic goal of which is to achieve European standards of living and a worthy place in the world, largely depend on the effectiveness of the use of innovative potential of industrial enterprises and the effectiveness of management of innovation activities on the basis of system transformations. That is why the basis of the economic development of the national economy is the purposeful formation of the innovative potential of modern enterprises and its competent use.

Table 1. Change of key characteristics in Poland and Ukraine from 1991 to 2017

Name of index	Poland	Ukraine
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(unit of measurement)	1991	2004	2017	1991	2004	2017
Territory, thousand sq. km	312,69	312,69	312,68	603,5	603,5	557,5
BBII, billion \$	85,5	255,1	524,5	77,46	64,88	112,15
Population, mln. persons	38,2462	38,1822	37,9758	52,0005	47,4516	44,8312
GDP per capita, \$/persons	2235,54	6681,18	13811,66	1489,6	1367,75	2501,69
Unemployment rate, %	12,97	19,07	4,95	5,76	8,59	9,45
The share of added value of the country's industry in the structure of GDP, %	*	28,97	27,88	54,55	32,54	23,99

* - no information

Source: compiled by the authors on the synthesis of data from the World Bank and the State Statistics Service of Ukraine.

A conclusive analysis suggests that Poland has achieved the best economic results and entered the European Union through the reforms and friendly business climate that allowed Poland to further strengthen the economy. Ukraine, which is almost 2 times greater than Poland, only increases its lag. This is due not only to the "debt-dependent" economic model of development but also to

occupational actions in the East and Crimea. It must be understood that ensuring small GDP growth will only lead to a default that will block Ukraine's access to international capital markets. Therefore, in Ukraine to achieve its success, it is very important to carry out economic reforms aimed at modernizing the economy and improving the country's culture of governance.

Conclusions.

Thus, it is determined that the analysis of economic development of territories should take place in the context of proposed information-analytical system of monitoring by means of diagnosing the potential represented by a set of tangible and intangible assets of economic entities that represent the productive forces of the territory consistent with the objectives of regional development, agreed upon with the goals of macroeconomic development of the state, strategic goals of the subjects of management of the territory, as well as the interests of all concerned. The feature of the proposed model of the information-analytical system for monitoring economic

development is the automated collection and processing of open primary statistical data of enterprises functioning, analysis of statistical data of these enterprises, obtained in the process of monitoring of data warehouses at the regional level, implementation of requests for data, using Internet technologies. The use of this functional model will contribute not only to the efficient organization of information collection, taking into account a large number of indicators that characterize the economic situation of territories, but an objective assessment of changes taking place in the region and forecasting the

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development of economic processes in the region.

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