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*New challenges, such as the COVID-19 pandemic shock for the global economy, require new approaches and technologies, on the one hand, and the actual emergence of new decisions in various areas of development, on the other hand, reveals signs of a transition to a new generation of life organization. The Issue is devoted to the disclosure of some aspects of the subject.*

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**CURRENT ISSUES OF COMMUNICATION INTERACTION BETWEEN  
GOVERNMENT AND PUBLIC DISCUSSION DURING THE COVID-19 EPIDEMIC  
CORONAVIRUS INFECTION**

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**Abstract.**

The article examines current issues of improving communication between public authorities and the public during the spread of coronavirus infection 2019-nCoV. Communications in public administration and the main elements of the communication process are described. The concepts of "communication" and "informing" are distinguished. Some practical tools for informing the

population about COVID-19 in Ukraine are described. The role of crisis communications during the pandemic has been studied. The main advantages and disadvantages of the process of the formation of communication interaction between public authorities and the public are given. Ways to reduce resistance to change and improve feedback in the communication system are suggested.

**Key words:** communication, COVID-19, changes, crisis communications, public administration.

**The urgency of the research.** The most pressing scientific problem is the need to study the processes and methods of the transition of power structures from information policy to effective communication with the public, as information openness of public authorities is one of the prerequisites for a democratic society, involvement of citizens in policymaking, effective governance and public control. These issues become especially relevant during the period of spreading new challenges for the state, such as the COVID-19 pandemic, as the future of the country depends on a timely response to them. The government's ability to ensure proper communication with the public can increase the effectiveness of the necessary changes required by the situation during the spread of coronavirus infection 2019-nCoV. The ability of the medical system to withstand a pandemic in the current circumstances largely depends on the establishment of effective communication between authorities and the public.

**Actual scientific researches and issues analysis.** The following scientists made a significant contribution to the study of the problems of communication interaction of public authorities with the public: E. Afonin, V. Bebyk, I. Vasylenko, S. Vdovenko, R. Voitovych, A. Kolodiy, V. Kuybida, A. Melnyk, K. Trygub, A. Tkachuk and others. However, there is a lack of research on the implementation of the practice of effective communication in the period of challenges facing our country today. Despite the rapid development of information technology and the active use of software in various systems, there are several problems regarding the reliability, openness, quality, and efficiency of information interaction.

**The research objective.** The purpose of this study is to substantiate the effective areas of communication between public authorities and the public from the standpoint of managing effective information exchange during the spread of coronavirus infection 2019-nCoV.

**The statement of basic materials.** The global pandemic has become a global lesson for humanity, and it affects many areas, including communications. In the context of intensifying the formation of civil society, communication is becoming a mandatory component of modern democracies, ensuring public participation in decision-making and control over government actions, openness between them, building public confidence in public authorities, and providing support, stabilizing public relations.

COVID-19, also known as coronavirus disease, is an infectious disease caused by the SARS-CoV-2 virus. It is transmitted between humans through the secretions of infected people, mainly by direct contact with respiratory drops of more than 5 microns. These drops can be transmitted at distances of up to 2 meters. It can also occur through the hands or fomites contaminated with these secretions in contact with the mucosa of the mouth, nose or eyes. The average incubation period is 5-6 days, with a range of 1-14 days. The average time from the onset of symptoms to recovery is 2 weeks when the disease has been mild, and may reach 6 weeks if it has been severe. The most frequent symptoms are fever, dry cough and tiredness. Most hospitalized cases and deaths are concentrated in the elderly and those with chronic diseases such as cardiovascular diseases, hypertension, diabetes and lung diseases. The most frequent complications are pneumonia, multi-organ failure, and sometimes death. As noted by the authors in previous studies, the health sector in Ukraine is in crisis, so the importance of preventing a pandemic at the state level is especially important.

Previously, the concept of "communication" was identified mainly with "informing", but they are a significant difference. Interpretations of the term "communication" are quite many, and they depend on the approach used by the authors of research - process, philosophical, psychological, social, economic, etc. [1]. At the same time, even within one approach, the concept of "communication" can characterize different processes - information exchange, social interaction, reaction to the received message, one-sided informing, etc.

In general, communication in public administration is defined as the movement of information, a tool of dialogue between participants in the management process, a component of the process of interaction between government and civil society. Regarding the communication interaction of public authorities with civil society organizations or individual citizens, this type of communication is interpreted by some authors as a set of actions for the formation and implementation of management tasks and functions, meeting the information and communication

needs of public service consumers and the authorities based on social communication technologies [2].

The Law of Ukraine "About Information" defines information as any information and/or data that can be stored on physical media or displayed electronically, and information activities - as a set of actions aimed at meeting the information needs of citizens, legal entities, and the state [3]. Besides, information is also facts about the world around us, which are reflected in the human mind, recorded in a certain way, and have the ability to reproduce.

The process of public administration communication contains components typical for any communicative act, in particular: 1) the sender-communicator, depending on the initiation of the communication process, it can be both government agencies of different branches and levels of government and civil society organizations citizens); 2) messages (official public information, oral or written, verbal and nonverbal); 3) the recipient (society as a whole, various institutions of civil society, individual citizens); 4) channels of transmission/dissemination of messages (interpersonal, institutional, mass; formal, informal); 5) feedback channels (requests, appeals of citizens, various forms of civic participation, etc.); 6) the process of coding-decoding information (preparation of information messages, their adequate interpretation by the audience, etc.); 7) various communication barriers (technical, semantic, psychological, nonverbal, sociocultural) [4].

In the age of information chaos, one of the key points in the fight against the spread of coronavirus is honest, responsible communication with the public about the level of morbidity, how to protect yourself and fight against the virus, and most importantly - where to get help. Therefore, the Ministry of Health should become the flagship of such communication.

It should be noted that the budget of Ukraine cannot afford to finance information activities, and the state press services are always working only on enthusiasm, the question arose as to who supports the "heavy communication artillery" of the Ministry of Health at present. It should be noted that one of the tools for informing the population about current issues regarding COVID-19 in Ukraine is Viber (3272732 participants as of 23.07.2020) and Telegram (752600 participants as of 23.07.2020). The description of the Coronavirus\_Info channels in Viber and Telegram has changed to a "volunteer community authorized by the Ministry of Health of Ukraine". The downside is that the "volunteer community" reports information from WHO concerning the news, rather than the source [5].



It should be noted that in the period of counteraction to the spread of COVID-19, crisis communications are becoming increasingly important, which should be distinguished from communications in times of crisis. The European Space website [6] presents a course "Crisis Communications", which is designed to help NGOs in communications to prevent the spread of coronavirus, as well as in establishing effective communication in crises. The course is interactive with weekly webinars, videos, practical tips, and ready-made templates for work. A Facebook group "Crisis Communications" has also been created, where administrators and moderators share current knowledge and practices in this area. It should be noted that this group presents a lot of information that reflects the latest trends in improving communication between public authorities and the public in the direction of counteracting the spread of COVID-19 and beyond.

At the same time, most international organizations have separate manuals on how to respond to a specific crisis. In general, crises are guided by the main principle of "doing what causes the least harm". The Practicum website presents the basic rules for responding to crises: take responsibility for the situation; intensification of the anti-crisis team; efficiency; choice of speakers; use of the CAP principle (Concern - 1%; Action - 5%; Perspective - 94%); adhere to two-way communications; constant monitoring of the situation; adherence to ethics and empathy [7].

On the website "Decentralization" [8] provides a guide for local government which identifies ten steps of communication during a pandemic: 1) establishing communication; 2) regular messages (definition of the spokesperson); 3) collection of information materials; 4) informing people; 5) cooperation with other state structures; 6) involvement of local opinion leaders; 7) popularization of verified information; 8) training of the community in preventive institutions; 9) explanation of the importance of preparation for a possible emergency; 10) identification of segments of the population in need of specialized assistance.

It should be noted that the implementation of any changes related to the COVID-19 warning provokes a common reaction in the public - resistance to changes. There are many reasons for this and they are often difficult to determine. However, whether the resistance is overt or covert, it should be seen as material for further consideration. The main reasons for such resistance may be the following: lack of proper information on changes; feeling anxious; hostility and non-acceptance of the news; lack of participation; distrust of the initiators, etc.

Today, citizens of any country are trying to find information about COVID-19 on their own. Unfortunately, the reliability of such information is very questionable. R. Sheremet explored the main reasons for the difficulty of finding true information: 1) people consume a lot of information. In 2019, the average statistician spent almost 7 hours online, including half that time on the phone [9]. A recent study found that Internet use during the pandemic increased by 47% [10]; 2) lack of responsibility for false information. UN Secretary-General Antonio Guterres said that according to research on one of the largest social media platforms, 40% of COVID-19 posts are generated by bots [11]; 3) social networks lead people into an "information bubble of like-minded people" in which people see almost no alternative opinions and this reinforces their prejudices [12]. The author also gave some tips that can change the situation: 1) reducing the consumption of news and information, especially - poor quality information; 2) consumption of information of those people whom you trust and who have a good reputation; 3) in social networks it is necessary to have friends and subscribers who do not agree with your opinion. This will help fight your prejudices.

A positive factor is the release of the video on the YouTube channel of the well-known in Ukraine and abroad E.O. Komarovskiy. This channel has 2.54 million subscribers as of July 23, 2020. On the positive side, it is fair to say that not only the presentation of interesting medical information in an accessible language for each individual but also the opportunity for quick feedback in the form of comments to the video in the format of questions and answers.

The website of the Ministry of Health of Ukraine also provides a wide range of information on coronavirus infection 2019-nCoV [13]. The site in the section "Citizens" provides information on operational information on the spread of coronavirus infection 2019-nCoV; the number of active cases; links to the verified Viber community and telegram channel; hotline phones; algorithm of actions for suspicions of COVID-19, etc. At the same time, the issue of quick feedback remains open.

At the same time, it should be noted that large-scale communication campaigns are underway in Ukraine to counter the spread of COVID-19. Authorities and local governments are trying to prevent the spread of the disease in the country thanks to these campaigns (for example, the all-Ukrainian campaign #I SupportDoctors, #StayHome, #IHome, etc.). But at the same time, they forget about the obligatory feedback in the system of communication interaction, which will allow forming a qualitative interaction. It should be noted that this connection should be formed

at the local level, ie not only public authorities but also local governments should make every effort to attract all possible tools. Sometimes there is a confrontation between citizens and their associations and structures of the health care system at different levels in the direction of providing the population with quality medical services in the treatment of COVID-19, as this issue is relevant for many citizens who are responsible for the epidemic.

Note that the main precautionary measures are: 1) wash hands frequently with soap and water. Avoid touching your face or mask; 2) when coughing or sneezing, cover the mouth and nose with the inside of the elbow; 3) maintain a safety distance of at least one meter with other people; 4) go to the doctor in case of fever, cough and breathing difficulty, calling in advance if you are in areas where the virus is spreading or if have been visited in the last 14 days; 5) stay at home if you start to feel unwell, even in case of mild symptoms such as headache, until you recover if you are in areas where the virus is spreading or have been visited in the last 14 days; 6) social distancing; 7) recommendations regarding the use of masks. The use of masks is not a substitute of other protection measures and hygiene recommended for the prevention of infection. In individuals infected with SARS-CoV-2 and in their close contacts, the use of a surgical mask is a priority over other types of mask [14, 15].

Based on the above, an effective model of public communication with public authorities in a period of increasing number of challenges for the state, requires an active position of each party: 1) ensuring information openness by public authorities, timely information about changes; motivation to act in accordance with the content of the information message, the formation of individual and collective consciousness [16, P. 4]; 2) formation of an effective system of "feedback" through the coverage of mechanisms of public control, public expertise, monitoring, public consultation on issues of priority importance to society [17, 18]; 3) information content on the full activation of civil society organizations of activities related to the implementation of informational, educational, expert-analytical, human rights functions; stimulation of public activity, initiative, increase of civic competence, in particular special skills of communicative interaction with authorities; 4) monitoring compliance with medical care protocols and preventing possible deterioration of its quality, compliance with moral and ethical standards, responsibility for providing false information, constant feedback from the public in the format of surveys and analysis of comments on social networks, etc.

The result of the successful solution of the specified tasks can become a creation of an integral system of informing of the public; obtaining objective data (in particular, in the dynamics) that characterize public opinion regarding the quality of medical services; increasing public activity on the way to counteracting the spread of COVID-19; involvement of the population in the process of resolving issues related to the epidemic; overcoming or weakening communication barriers in public relations, reducing not always justified claims to public administration, reducing paternalistic sentiments.

**Conclusions.** Today, in the 21st century, communication is proactive interaction. It is much more than information, in particular, it is "live" communication with opinion leaders or with ordinary people who are interested in government activities in various fields, it is a process of dialogue and discussion, a procedure that should promote a common understanding of certain views and principles. Public authorities themselves must seek to promote their activities, and at the same time study and take into account public opinion, and this is possible only with effective feedback. Only if government officials realize the difference between "informing" and "communicating" can significant changes be expected towards the formation of a partnership between public authorities and society. In our opinion, the very issue of participation and involvement of the public is key to establishing communication in any field, including counteracting the spread of COVID-19. When public authorities and local governments do not sufficiently transparently analyze the problems that arise during crises in the state, make decisions based on unclear motivations, in violation of procedures, and then only information about the decision - this is the main cause of communication problems. Public misunderstanding of certain steps taken by government officials can lead to active opposition to change, which only hinders active opposition to the spread of COVID-19.

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**SHALL IT BE PRODUCTIVE OR (AND) EFFECTIVE? SEARCH FOR POTENTIAL  
OPPORTUNITIES TO IMPROVE THE EFFICIENCY IN USING HUMAN RESOURCES  
OF THE ENTERPRISE**

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**Abstract.**

In the paper was proposed a methodological toolkit for assessing the efficiency in using human resource as a source of competitive advantage of companies, based on a dynamic standard (in the author's interpretation), formed by the economical justification of its key HR-metrics, cause and effect comparison with their further ranking in the dynamics and calculation methods of mathematical statistics. This will allow informatively, adequately to the inversion type of market transformations, that observed today and taking into account the time factor, to analyze all substantive aspects of the object of research that cannot be estimated by classical methods, which traditionally boil down to the analysis of a certain set of labor indicators in statistics and / or comparison their magnitudes over a number of periods, and do not imply the identification of mutual influence, significant relationships, and the dynamic subordination between them. The scientific novelty lies in devising a matrix model for selecting strategies for improving the efficiency in using human resource, which combines its integral indicator with the rating position of the enterprise in terms of labor productivity indicator in the industry, which allows comprehensively approach to the issues of evaluation of such efficiency, obtain economic benefits from synergy and can claim to versatility as an analytical tool. According to the results of the research the estimation of the efficiency in using human resources of the enterprises-



leaders of the sauce and seasonings market in Ukraine with corresponding recommendations on the options of strategic development in this direction.

**Keywords:** efficiency in using human resources, dynamic standard, graph, integral indicator, matrix.

## INTRODUCTION

Human resources are the key asset of the company, whose value in the context of global personnel default, that are projected and the innovation of the economy, drives which they are, is growing. Accordingly, for Ukrainian business bring new challenges, that complicate the management process and, in particular, the role of human resources in it, which means that there is an urgent need to obtain comprehensive and fully information about the efficiency of their using for making the reasonable management decisions, which in turn, leads to the need to improve methodological approaches to measurement. At the same time, the dynamism of the market environment and the internal business processes of companies requires to extrapolate it to a methodological toolkit of such an assessment, which should be based on a system of dynamic HR metrics, tracking which will allow companies to control the efficiency in using human resources, and most importantly - to determine the strategic directions of its enhancement. The majority HR executives of Ukrainian companies approach to this issue intuitively and situationally, or by using established techniques that do not take into account the realities of time. Instead, it is traditional among scientists to note the assessment of efficiency in using human resource to the separation of different combinations of its partial indicators, with rare attempts to aggregate them into the integral indicator, which also updates the theme of further research.

The research experiments were based on the idea of normative (reference) ordering of economic systems indicators in dynamics, what has been called «the theory (method, model) of dynamic standard», first formulated in the work of Professor Syroiezhyn I.M. [1], and developed in the writings of his followers – Motyshyna M.S. [2], Pohostynska N.M., Pohostynskyi Yu.A. [3] and Tonkykh A.S. [4], who devised methodological rules and procedures for their statistical evaluation. Nowadays, the method of dynamic standard is actively discussed in the scientific community and is widely practiced in completely different aspects of analysis: the socio-economic efficiency of banking activities [5], the liquidity of the banking system [6], the balance



of development of enterprises [7], the investment activity of non-state pension funds [8], performance of corporate finance management [4] and others, however, there is lack of scientific development on how to build a dynamic standard for assess the efficiency in using human resource of enterprise. The paper presents its author's version, which contains a system of indicators for the directions of their using, theoretically substantiated by domestic economists: Bahrii K.L. [9], Lashkun H.A., Shakhno Yu.A. [10] and Cherep A.V. [11]. *The object of research* is the process of ensuring the efficiency in using human resources of enterprises.

## METHODS

In the paper were found the traditional general scientific and special methods, which allowed to examination the objects and phenomena in close relationship and to solve the list of tasks set before the researcher: *the theoretical generalization, system analysis and synthesis* – for clarification the subject-object scope of research; *the statistical grouping and method of relative values* – for formation the system of key indicators of efficiency in using human resources of enterprises; *the method of reference dynamics of the indicators* – for construction the linear and nonlinear dynamic standard of such efficiency, and for calculation of its integral indicator (EF) – *the non-parametric method of statistic; methods of strategic diagnostics* – with the purpose of positioning the enterprise in the strategic matrix «EF – the rating indicator of labor productivity»; *method of logical generalization* – in formulating conclusions of investigations.

## RESULTS AND DISCUSSION

Disparate indicators in the statistic are matched in dynamics and, moreover, have a distinct cause and effect relationships, so they can be ranked and subordinate the relative to each other – this observation became the basis for the development of the theory about dynamic standard, founded by a famous scientist Syroiezhyn I.M. [1], was awarded by the author's certificate, which he also validated during his work as a part of the United Nations Expert Group on Planning Methodology. In general, under the term of a dynamic standard is understood a set of indicators, which organized in terms of growth rate, so that maintaining this order for a long time interval provides the best mode of the economic system operation [2, p. 210]. The completed methodology of its estimation by the methods of nonparametric statistics and the mathematical

apparatus of the theory of matrices, which are used now, is phased formed and brought to practical capacity in papers [2 – 4].

The construction of a dynamic standard begins with the selection of key indicators of the phenomenon, which is being analyzed. Some authors are betting on absolute indicators [5, 8], others [6, 7] – on relative ones, which, in our view, more comprehensive characterize the concept of «efficiency», as opposed to absolute, which are measures of «effect». The recommended optimal number indicators of dynamic standard is in the range up to 10 [1, p. 85] and from 6 to 25 [3, p. 55]: both too few and too many can lead to errors in further integral assessment and loss of its information content.

By scientists, who consider the evaluation of efficiency in using human resources of enterprise theoretical platform for research [9 – 11 and many others] have established its basic directions, notably: the analysis of productivity and profitability of labor; the availability of workforce in the enterprise (its number, composition and movement); the working time fund. Consequently in table 1, we have submitted metrics of efficiency in using human resources of enterprise with a breakdown on groups of indicators, which appropriate to each of these directions.

Table 1. Table captions should be placed above the table

№	Indicators	Formula of calculation	
1	<i>Labor productivity and personnel profitability</i>		
1.1	Profitableness of personnel	$P_p = P_{oper} \div N_{av}$	(1)
1.2	Labor productivity	$LP = PV \div N_{av}$	(2)
1.3	Capital-labor ratio	$CL_r = BPF \div N_{av}$	(3)
1.4	The coefficient of ratio the average wage on the enterprise to the average industry wage	$C_w = W_{int} \div W_{ind}$	(4)
1.5	Defect coefficient due to fault of employee	$C_{dfem-e} = V_{dfem-e} \div PV$	(5)
2	<i>Stability of personnel and their qualitative composition</i>		
2.1	Coefficient of personnel stability	$C_{stab} = N_{stab} \div N_{av}$	(6)
2.2	Coefficient of qualified employees stability	$C_{stabq} = N_{stabq} \div N_{av}$	(7)

2.3	Coefficient of prospective employees turnover	$C_{turnpr} = N_{turnpr} \div N_{av}$	(8)
2.4	Coefficient of personnel turnover	$C_{turn} = N_{disturn} \div N_{av}$	(9)
3	<b><i>Efficiency in using work time</i></b>		
3.1	Coefficient of efficiency in using work time	$C_{ewt} = WT_{act} \div CF_{wt}$	(10)
3.2	Coefficient of breach labor discipline	$C_{bld} = \frac{L_{ishld}}{EF_{wt(per.-hours)}} + \frac{L_{rounld}}{EF_{wt(per.-days)}}$	(11)
<p><i>Notation keys:</i> P<sub>oper</sub> – the operating revenue; N<sub>av</sub> – the average number of employees; PV – the production volume; BPF – the basic production funds; W<sub>int</sub>, W<sub>ind</sub> – the average monthly wage for the year, accordingly by enterprise and by industry; V<sub>dfem-e</sub> – the value of the defect due to fault of employee; N<sub>stab</sub> – the number of stable employees with more than 3 years of experience in the enterprise; N<sub>stabq</sub> – the number of qualified employees who have advanced training, have undergone retraining and / or vocational training and have been on the company lists for the last 3 years; N<sub>turnpr</sub> – the number of prospective employees whose development the company has invested for the last 3 years; N<sub>disturn</sub> – the number of employees, dismissed for reasons of personnel turnover; WT<sub>act</sub> – the actual time worked (person-hours); CF<sub>wt</sub> – the calendar fund of work time; L<sub>ishld</sub> – the intra-shift losses of work time related to a breach labor discipline, (person-hours); L<sub>rounld</sub> – the round-the-clock losses of work time related to a breach labor discipline (person-days); EF<sub>wt(per.-hours)</sub>; EF<sub>wt(per.-days)</sub> – the effective fund of work time accordingly in person-hours and person-days.</p>			

The relative indicators from the table 1 will be used to form a dynamic standard by establishing the ratio of their tempo values, which will be economically interpretable and have high diagnostic informativeness to evaluate the efficiency in using human resource. An ordinal scale of growth rate (T) labor productivity indicators and personnel profitability would be as follows:

$$T(P_p) > T(LP) > T(CL_r) > T(C_w) > 100\% > T(C_{dfem-e})$$

(12)

The initial element of a dynamic standard T(P<sub>p</sub>) guarantees the maximum efficiency in using human resources for the enterprise through the operating revenue indicator per employee, because, in our opinion, this kind of profit is directly influenced by the production personnel, since profits from other operating, financial and investment activities, mainly, the result of

management influence and unregulated factors of diverse nature. The benchmarking  $T(P_p)$  i  $T(LP)$  in favor of the former indicates the available cost savings of production and marketing of enterprise commodities, because, there is a more intensive profit growth in comparison with growth of production volumes and further sales.

The dependence of indicators  $T(LP) > T(CL_r)$  explains the enhance in production capacity of the enterprise through progressive rates of results of output growth over labor financial security, and indicators  $T(CL_r) > T(C_w)$  – more dynamic using the means by the personnel, which were invested by the enterprise in basic production funds as a driver of productive capital rather than aimed at labor remuneration which determines its motivational environment.

The ratio  $T(LP) > T(W_{av})$  is a classic and a determined for assessment of efficiency in using human resources: with productivity growth are created the real prerequisites for increasing level its remuneration, which, in turn, enhances employee motivation for more productive work. Comparison of average wage by enterprise and by industry will give a more objective picture of satisfying the level of material requirements of employees of a particular enterprise and assessing the prestige of labor.

Defects of goods causes additional losses for the enterprise and increases the cost price of its production, and defects due to fault of employee is also attest to lack of competence (qualification) or the level of practical training of such employees, which should be minimized:  $100\% > T(C_{dfem-e})$ .

In relation to personnel stability indicators and their qualitative composition (table 1) we present their dynamically ordering in the following way:

$$T(C_{stabq}) > T(C_{stab}) > 100\% > T(C_{turn}) > T(C_{turnpr}) \quad (13)$$

Inequality  $T(C_{stab}) > 100\%$  – is a positive trend towards building employee loyalty to the employer, who is satisfied with wage and working conditions for at least the last three years, and  $T(C_{stabq}) > T(C_{stab})$  – on the increment of loyalty of qualified personnel, who actively involved in the process of professional development. As is custom, indicators of personnel turnover should decline in dynamics in order to eliminate threats to the personnel security of the enterprise due to

staff leakage. Moreover, the rate of decrease in the coefficient of personnel turnover as a whole  $T(C_{turn})$  should be lower than the rate of decline prospective employees  $T(C_{turnpr})$  because the latter are costly for enterprise (in addition to the salary, a sufficiently long time in professional and personal development, career advancement of prospective employees are invested money, which, if they are fired, will not receive a financial return in the form of productive labor results) and strategically important to close key positions by internal candidates.

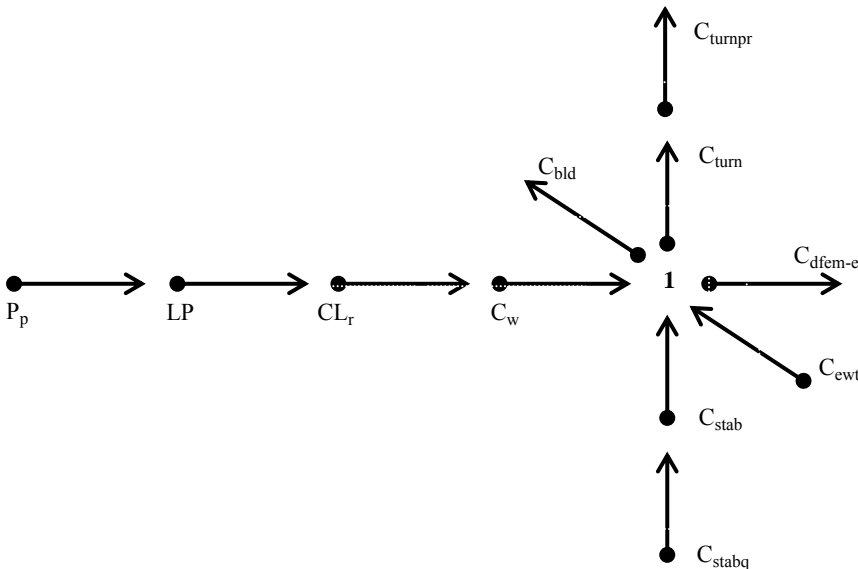
The efficiency in using work time, which is determined by the self-titled indicator and is another component of assessment of efficiency in using human resource (table 1), should increase, and the coefficient of breach labor discipline, in reverse:

$$T(C_{ewt}) > 100\% > T(C_{bld})$$

(14)

An ascending dynamic  $C_{ewt}$  means that on the enterprise is reducing unproductive losses of working time, and a downward trajectory of movement  $C_{bld}$  describes an effective system of prevention and control over the employees' compliance with the rules of internal labor arrangements, work regulations and self-organization.

The formed above dynamic standards (12) – (14) are linear, means such, where the temporal pairwise ordering of the indicators has an unambiguous interpretation of the economic relations between them, and can be used autonomously as partial evaluation indicators of efficiency in using human resource. However, from a systemic approach point of view, they should be combined. As a result, we obtain a nonlinear dynamic standard (fig. 1), when interdependence between some pairs of tempo indicators is not obvious, but in the aggregate compliance with their reference dynamic will ensure to any enterprise the high efficiency in using of human resources.



**Fig. 1: Graph of the reference ordering the indicators of efficiency in using human resources in the enterprise**

\* Compiled by the author on indicators, the notation keys of which are given in table 1

\*\* The elements of the graph are not the relative indicators but indexes

Nonlinear dynamic standard of efficiency in using human resources of the enterprise, except the graph of the reference ordering (fig. 1), can be represented with the assistance the mathematical apparatus of matrix theory, and to be analyzed by methods of nonparametric statistics according to the methodological recommendations shown, which is presented in steps below [3, c. 66; 5, c. 255]:

1. Indices calculation of change of indicators as a part of a dynamic standard:

$$I(b_i) = b_i^1 \div b_i^0 \quad (15)$$

2. Constructing a matrix of reference ratios of indexes changes in indicators on the basis of the matrix of preferences and guided by the principle of their transitivity:

$$e_{ij} = \begin{cases} 1, & \text{if } I(b_i) > I(b_j) \\ -1, & \text{if } I(b_i) < I(b_j) \\ 0, & \text{if between } I(b_i) \text{ and } I(b_j) \text{ absent reference ratio} \end{cases} \quad (16)$$

3. Constructing the matrix of actual ratios of indices change in the indicators of the dynamic standard:

$$f_{ij} = \begin{cases} 1, & \text{if } I(b_i) > I(b_j) \\ -1, & \text{if } I(b_i) < I(b_j) \\ 0, & \text{if } I(b_i) = I(b_j) \end{cases} \quad (17)$$

4. Constructing the incidence matrix of the reference and actual ordering of indexes change in indicators of dynamic standard:

$$d_{ij} = \begin{cases} 1, & \text{if } e_{ij} = 1 \text{ simultaneously with } f_{ij} \geq 0, \\ \text{or if } e_{ij} = -1 \text{ simultaneously with } f_{ij} \leq 0 \\ 0, & \text{in another cases} \end{cases} \quad (18)$$

5. Calculation of efficiency integral indicator:

$$EF = \sum_{i=1}^n \sum_{j=1}^n d_{ij} \div \sum_{i=1}^n \sum_{j=1}^n |e_{ij}| \quad (19)$$

Notation keys in the formulas are as follows:

$I(b_i)$  – the index changes in the i-the indicator b;

$b_i^1, b_i^0$  – an absolute amount of the indicator b in the reporting and base periods, respectively;

$i, j$  – sequence number of indicator  $b$  in dynamic standard that matches the  $i$ -th row and the  $j$ -th column;

$e_{ij}, f_{ij}, d_{ij}$  – according to the matrix of reference, actual, incidence of reference and actual ordering of indexes changes in indicators of dynamic standard;

EF – the efficiency integral indicator, range of the assessment those lies within  $[0;1]$ .

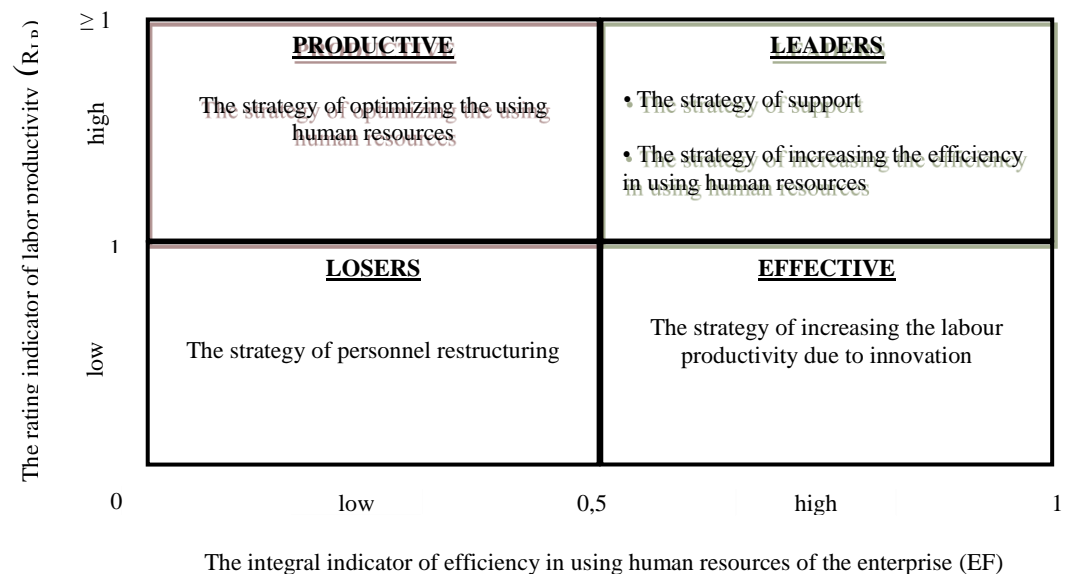
The closer the value of EF gets to 1, the more normative (reference) ratios of indexes change in indicators are actually being applied. About the efficiency in using human resources should talk subject to  $0,5 \leq EF \leq 1$ .

For the purpose of building the comprehensive methodology for assessing the efficiency in using human resource, is created by us, a strategic matrix, that allows the enterprise to be placed in a two-dimensional coordinate system, where the horizontal vector is its integral indicator, and as a landmark on vertical vector was elected a central indicator of efficiency as labor productivity as the ratio of its actual value of the enterprise to the mid-industry, which allows to get a rating:

$$R_{LP} = LP_i^1 \div LP_{mid-in}^1 \quad (20)$$

where  $R_{LP}$  – the rating indicator of labor productivity;  $LP_i^1$  – the labor productivity of the  $i$ -th enterprise in the reporting year;  $LP_{mid-in}^1$  – mid-industry meaning of the labor productivity in the reporting year according to the State Statistics Service of Ukraine.

The developed matrix of efficiency estimation in using human resources of the enterprise will have four quadrants, each of which contain a corresponding strategy in this field, which is summarized in the figure 2. The value of the horizontal scale of the matrix «EF- $R_{LP}$ » 0,5 is consistent with the boundary mark, after its crossing will begin progressive-regressive changes of the integral indicator of the efficiency in using human resources, which will become exceptionally progressive when in proximity to 1.



**Fig. 2: The matrix of the strategic positioning the enterprise in the coordinate system «the efficiency in using human resources – the rating indicator of labor productivity»**

\*Compiled by the author

The interval of the vertical scale of the matrix [0;1] means that the personnel labor productivity of the enterprise is below than its mid-industry level, and, accordingly, exceeding the mark 1 is regarded as a significant benefit in a competition.

Every strategic position in the matrix on fig.2 requires an economic justification (table. 2).

**Table 2. The characteristic of strategic capabilities of improvement the efficiency in using human resources of the enterprise in the matrix «EF –  $R_{LP}$ »**

The matrix coordinates	Linguistic evaluation of the scale	The content of the strategy
<i>The strategy of personnel restructuring (quadrant «LOSERS»)</i>		
EF [0;0,5]  $R_{LP}$ [0;1]	EF, $R_{LP}$ : low	Continuous audit of all directions of using human resources, implementation of a complex of anti-crisis and



		preventive measures, such as: scientifically substantiated normalization of labor and revision of its norms; optimization of personnel composition, taking account of the real personnel needs; eliminating the imbalance between remuneration and labor productivity; improving the qualitative composition of personnel; system in saving of costs on personnel; critical revision of HR-policy
<i>The strategy of optimizing the using of human resources (quadrant «PRODUCTIVE»)</i>		
EF [0;0,5] R <sub>LP</sub> [0;1]	EF: low R <sub>LP</sub> : high	Here, the emphasis should be on the indicators-perpetrators of the nonlinear dynamic standard of efficiency in using human resources in order to overcome their negative dynamics and stabilize positive changes in time
<i>The strategy of increasing the labor productivity due to innovation (quadrant «EFFECTIVE»)</i>		
EF [0,5;1] R <sub>LP</sub> [0;1]	EF: high R <sub>LP</sub> : low	Searching and mobilizing innovative reserves of labor productivity improvement: reengineering of personnel processes, corporate informative HR-systems, digital-recruiting, developing of command and management structure, kaizen-management and others. This is exactly about innovations, because the high level of EF in this quadrant means that the enterprise has already formed favorable conditions for improving labor productivity, there are not enough new approaches to strengthen its industry position
<i>The strategy of support (quadrant «LEADERS»)</i>		
EF [0,5;1] R <sub>LP</sub> [1; ∞]	EF, R <sub>LP</sub> : high	Maintaining the status quo of acquired positions through the establishment on the enterprise monitoring system of efficiency in using human resources and benchmarking of competitive-companies' positions
<i>The strategy of increasing the efficiency in using human resources (quadrant «LEADERS»)</i>		

EF [0,5;1] R <sub>LP</sub> [1; ∞]	EF, R <sub>LP</sub> : high	Rising investment in human resources development, improving the labor motivation mechanism, stimulating employees to innovations, strengthening the corporate culture and promoting a positive image of the employer in the labor market
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\* Compiled by the author

CONCLUSION

Dynamics of the market environment from outside the enterprise and permanent organizational transformations inside are reflected in the pace priorities of changes in economical indicators of their activity, in particular, indicators of using human resources as a strategic asset and a source of future benefits from investments. With this in mind, the constructed dynamic framework can serve as a universal tool for integrated assessment and comparison of the efficiency in their using for manufacturing enterprises, regardless of industry, size, scale of production and ownership. Comprehensiveness of such estimation provides its combination with the rating, the symbiosis of which takes the form of a matrix of choice the strategy of efficient in using human resources, where as the vector lines are chosen its integral indicator, according to the normative-index model (nonlinear dynamic standard) and the rating indicator of labor productivity, weighted on the branch specificity. Each of the five strategies proposed is a program of basic recommendations that will allow to uncover potential reserves for improving efficiency in usng human resource and labor productivity at the enterprise. Logically, arises the question of determining the degree of difficulty individual indicators of the dynamic standard, which will signal to the executives on priorities in their decision (an opportunity for them not to waste efforts, but to concentrate on specific processes of personnel using), which determines the directions of further scientific research.

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**COMPARATIVE ANALYSIS OF THE CURRENT STATE OF INFORMATION-  
COMMUNICATION TECHNOLOGY IN UKRAINE AND IN THE LEADING  
COUNTRIES OF THE WORLD**

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**Abstract.**

The article covers the major issues of the development of information and communication technologies in Ukraine and in the leading countries of the world. The main elements of information economy such as “Internet of Things” and artificial intelligence are described. The authors give a clear explanation of the main trends in digitalization process in Ukraine outline both advantages and obstacles and its influence on the national economy. SWOT and PEST analysis of the use of information technologies in the national economy were presented. The main competitors on information technology market are determined such as EU and China. The

comparative analysis of the information and communication technology and digitalization process is carried out.

**Key words:** national economy, information and communication technology, digitalization, information economy, “Internet of Things”, artificial intelligence, ranking.

**Introduction.** Transformation processes of the national economy in the context of the introduction of information technology cause rapid changes in the very understanding of economic processes. At the same time, constant changes in economic relations due to the openness of national economies have led to the active involvement of information technology in all economic processes. Today in Ukraine, as well as all over the world, an innovation-oriented national economy is being formed, which uses the tools of information technologies, the basis of which is knowledge. Although information technology is only one of the tools that can be used to regulate the national economy, but it significantly affects the results depending on the availability of qualified personnel. For Ukraine, the development of this area is important, because now there is a convergence of the field of information technology with other areas of the national economy.

Digital technologies have significantly changed the speed of the economy. The Internet and digital devices are the engine of economic growth. The transformation of economic processes of the national economy under the influence of information technology requires large expenditures on resources and upgrades. Therefore, the role and place of information technology in the development of economic relations and processes in the national economy is a major issue in modern conditions. Low ability to effectively attract information technology to optimize the economic processes of the national economy is an ambiguous factor that can lead to both negative and positive impact on the national economy [11, p148].

**Analysis of recent research and publications.** Theoretical principles of information economy, its ways of development as well as the latest information and technological principles were covered by Yu. Bazhal, D. Bell, M. Kastels, R. Kelerab A. Maslov, V. Muntiiian, R. Nizhehorodtsev, Dzh. Stihlits, A. Chukhno.

A significant contribution to the study of information technology and information economy sphere was made by V. Hlushkova, V. Ivashova, H. Kalytycha, S. Lazarieva, Yu. Lutsyk, B. Malyskyi, L. Melnyk, V. Parkhomenko, O. Popovych, V. Syzonenko, V. Soloviova, A. Tkachova, O. Chubukova and others. The scientific study of I. Nosatov deserves special

attention. His works consider the issues of development and regulation of information technologies in Ukraine. However, the issues of the development of information and communication technologies require further study in the context of foreign experience in this sphere due to the informatization and digitalization as a world tendency.

**The research objective.** *The purpose of the article* is to explain theoretical and methodical principles of development of the information and communications technology in Ukraine and in the world, to carry out comparative analysis of the information and communications technology.

**The statement of basic material.** Active use and implementation of information technology forms new relations in the national economic environment, and the competition of information economy entities is growing rapidly. Modern information technologies possess an unlimited resource in obtaining data that accelerates the solution of all economic processes. Information technology as one of the permanent parts of the functioning of economic processes in the national economy of Ukraine is beginning to develop rapidly, but we must take into account both negative and positive effects on economic processes [11, p. 149].

The main purpose of IT in the national economy is structuring of economic processes in empirical form, such as:

- Selection of structural elements in the integration of information technology in economic processes of national economy;
- Determining technical and economic types of relations among subjects and objects of economic process;
- Creation of basic elements of functioning of economic processes, which are involved in integration of information technology;
- Outlining new possible forms of work, communication in information economy.

The optimal state of information technology is determined by the level of satisfaction of the needs of the economic process and its end result. Information technology in economic processes can be divided into two subtypes: information technology support (ITS) and functional information technology (FIT). ITS - is multi-tasking technology used in different subject areas for different types of tasks. FIT is a technology that performs only highly specialized tasks for one subject area. Information economics is considered as a combination of two components - the socio-economic system and economic analysis, which has in its tools neoclassical, institutional and neo-institutional analysis. Information economy is a new approach to the implementation of

economic processes, which can be both ancillary and independent element of the functioning of the economic process in the national economy. A characteristic feature of the information economy is the creation of network relations as a special communication between all participants in the economic process.

One of the key elements of information economy is "Internet of Things". "Internet of Things" (IoT) or "smart manufacturing": the application of information and communication technologies (ICT) in all aspects of production is in the midst of the transformation of modern production. Such digitalization of production changes as products are designed, manufactured, used, operated and maintained after sales. This convergence of digital technologies with the manufacturing industry also promises to change the landscape of global competition in manufacturing [3].

To better understand the process of digitalization in the world economy, it is necessary to pay special attention to the key aspects of digitalization policy implemented by the G20 countries [5]. The main provisions of digitalization policy in Europe and the world are the Documentary Recommendations. Recommendation 1: Promote global interconnection: The G20 should promote global interconnection by defining an agreed framework for cybersecurity, supporting good governance, ensuring free and secure cross-border data flows, and encouraging investment in ICT infrastructure and skills development. Recommendation 2: Strengthening the Fourth Industrial Revolution (Industry 4.0) and the Industrial Internet: The G20 should support the spread of the Fourth Industrial Revolution and the Industrial Internet by fostering innovation, ICT infrastructure deployment and the development and use of global standards. Recommendation 3: Adopt artificial intelligence: The G20 should support the evolution of human-centered artificial intelligence and related technologies by providing an informed public dialogue on opportunities and challenges, supporting the development and implementation of innovations and accelerating the implementation of smart infrastructure. Each Recommendation contains actions that need to be undertaken in order to meet the challenges and develop more advanced digital and information environment in the world.

One of the most measurable aspects of digitalization is the Internet economy, which includes, for example, e-commerce and Internet-related investments in information and communication technologies (ICTs) [5; 11, p. 148].

Thus, one of the key aspects of digitalization is artificial intelligence: a far-reaching field of innovation that can take digitalization to the next level of economic transformation. Artificial



intelligence refers to technologies that allow machines to perceive, learn, reason, and make or support decisions. Artificial intelligence technologies can enable machines to automate and optimize processes as well as services, or even solve complex problems. Innovations that support artificial intelligence, such as self-driving vehicles, smart infrastructure, the smart healthcare system, or machine learning, have great potential to help people and improve lives. However, new technologies, such as artificial intelligence, also cause significant problems for society. Its potential impact and full consequences are not yet fully understood, particularly when it comes to the impact on the workforce, such as labor savings or changes in the demand for skills. Therefore, in our opinion, one of the main reasons for public skepticism is the lack of examples that illustrate the widespread use of artificial intelligence programs in all sectors that help people and benefit their work and daily life [5].

If we consider the experience of the EU and China then the outcomes are the following.

As we are living in information era, the issue of detailed analysis of information technology is one of the priorities for determining the development of economic growth of the national economy and its regulatory component. The emergence of new indicators of informatization of economic processes requires further development of the index system of information technology evaluation. However, the priority is to unify the indices of evaluation of information technology in economic processes to identify the basis for the creation of regulatory tools, approaches and mechanisms [9; 10; 11].

The most common indices for determining the diversity of information technology are composite - these are indices built from a set of indexes. The choice of such a set depends on determining the priorities and results to be achieved.

The most common in international practice are the following indices: Information Society Index (ISI), Network Readiness Index (NRI), Digital Divide Index (DDI), Digital Access Index (DAI) , DAI), ICT Diffusion Index, ICTDI) (Table. 1) [6; 8; 11;12].

Table 1

List of international assessment indices of Information technology

International company/Developer	Web-site	Organization, which developed indexc
Global Competitiveness Index (GCI)	<a href="https://www.weforum.org">https://www.weforum.org</a>	World Economic Forum

Digital Division Index (DDI)	<a href="http://www.itu.int">http://www.itu.int</a>	ITU
Digital Access Index (DAI)	<a href="http://www.itu.int">http://www.itu.int</a>	ITU
Network Readiness Index (NRI)	<a href="http://reports.weforum.org">http://reports.weforum.org</a>	World Economic Forum
Information Society Index (ISI)	<a href="https://www.idc.com">https://www.idc.com</a>	IDC
Global Opportunity Index (GOI)	<a href="http://www.globalopportunityindex.org">http://www.globalopportunityindex.org</a>	Milken Institute
ICT Development Index (IDI)	<a href="http://www.itu.int">http://www.itu.int</a>	ITU

**Source:** combined on the basis [6; 8; 11;12]

One of the critical issues in the analysis and regulation of informatization in the national economy is employment. The unpreparedness of domestic legislation on the outsourcing model of labor use requires its constant analysis and improvement. Although Ukrainian legislation has a number of changes regarding the Law of Ukraine “On Employment”, which will allow the employer to hire employees on a contractual basis and control this process by the State Employment Service of Ukraine. An important step is the recognition of remote (distance) work as one of the types of permanent employment [11, p.150].

Here is the foreign practice of state participation in the information society in European countries (Table 2.)

Table 2

**Foreign Practices of State Participation in the Information Society in European Countries** [11; 15]

Country	Description
Germany	<p><i>The main authorities:</i> Government Commissioner for IT, Councils of Departmental and Commissioners for IT, Federal IT Management Groups and IT Planning Council, Federal Network Agency.</p> <p><i>State initiatives:</i> Concept “Federal Regulation of IT”, Monitoring “Legislative Regulation of Access to the Information Society”, Agreement on Establishment of the Council for IT Planning and on the Basis of Cooperation in the Field of Information Technologies between Administrative Institutions of the Federal</p>

	<p>Government and Federal Lands, e-Government 2.0 Program, Strategy on e-Government “Germany Online”, “National Strategy on E-Government”, Malmö Declaration of the European Union, Law on Regulation of De-Mail Services, as well as on Amendments to Additional Regulations, Data Protection Code, European Digital Agenda - Europe 2020.</p>
Sweden	<p><i>The main authorities:</i> T Commission (1994–2003), IT Policy Strategies Group (2003–2006), Government IT Council (2007–2010), Digitalisation Council (Digitaliseringsrådet), Ministry of Entrepreneurship, Energy and Communications, Legal, Financial and Administrative Services and Public Procurement Agency, selected government departments and bodies, Swedish Public Administration Agency (Statskontoret), Swedish National Audit Office (Riksrevisionen), Swedish Data Inspection Board (Datainspektionen), Ministry of Enterprise, Energy and Communications e-Government, Swedish Administrative Development Agency (since 2009 - E-Government Delegation).</p> <p><i>State initiatives:</i> Law on Electronic Commerce and Other Information Society Services, Law on Qualified Electronic Signature, Law on Public Access to Information and Secrets, Law on Personal Data Protection, Law on Electronic Communications, Law on Public Procurement Action Plan to Reduce Administrative Burdens for enterprises, the bill “From IT policy for society to policy for information society”, Green Knowledge Society concept, European Digital Agenda - Europe 2020, Swedish government strategy ICT for all. Digital Agenda for Sweden, Public Electronic Forum</p>
Poland	<p><i>The main authorities:</i> Ministry of Management and Digitization (Ministerstwo Administracji i Cyfryzacji, MAC), Ministry of Administration and Digitization, State Service for Responding to Cyber Threats.</p> <p><i>Державні ініціативи:</i> Strategies for the development of the information society in Poland until 2013, the National Digitalization Program "Polska Cyfrowa - PO PC, European Digital Agenda - Europe 2020", the Comprehensive State Program of Informatization (Program Zintegrowanej Informatyzacji Państwa, ZIP), the ePUAP e-government platform, support for public initiatives for activation of digital</p>

	literacy and e-integration, education and information campaigns to increase the importance of e-education and promote the benefits of using digital technologies; E-pionier initiative - promotion of advanced digital skills through competition; program for talented programmers, the project "Promotion of the Internet and the development of digital literacy", the Law "On protection of classified information", the Law "On protection of personal data", the Law "On electronic services"
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Word digitalization competitiveness ranking can be presented in the following way (Table 3).

Table 3

IMD World Digital Competitiveness Ranking 2019

Rank	Country
1	United States
2	Singapore
3	Sweden
4	Denmark
5	Switzerland
...	
17	Germany
62	Mongolia
63	Venezuela

Concerning the situation with digitalization in the EU-member states, then it’s worth mentioning that EU Digital Economy and Society Index figures over the last 5 years show that targeted investment and robust digital policies can have a significant impact on the performance of individual countries.

Connectivity has improved, but remains insufficient to address fast-growing needs. Digital Economy and Society Index indicators show that the demand for fast and ultrafast broadband is on the rise, and is expected to further increase in the years in view of the growing sophistication of internet services and business needs. More than one third of Europeans in the active labour

force do not have basic digital skills, even though most jobs require at least basic digital skills, and only 31% possess advanced internet user skills. 83% of Europeans surf the internet at least once per week (up from 75% in 2014). In the digital public services, where EU regulation is in place, there is a convergence trend among Member States for the period 2014-2019.

China is already on its way to becoming a world leader in digital technologies. It is a leading digital market with private startups worth more than 1 billion USD. China has made significant progress in programs such as artificial intelligence: face recognition, blockchain technology and quantum computing, as well as in many other sectors such as logistics, e-commerce, fintech, autonomous driving and digital health.

Chinese companies compete successfully around the world in ICT products and services. China is actively setting international standards for new technologies, including blockchain, the “Internet of Things”, and 5G, providing leadership positions in international standard-setting bodies. China enjoys structural advantages in advancing its bold plans to digitalize its economy and achieve global technological leadership.

China plans to use digital technology to effectively manage and control companies and individuals and focuses on two main goals: a) protection of critical infrastructure and data from access by foreign countries; b) establishment of powerful data-based control mechanisms for monitoring enterprises and citizens.

China's digitalization policy is putting some pressure on Europe. China's digital ambitions are already having an impact on Europe's politics, economy and security. The Digital Silk Road is likely to deepen China's digital access to Europe. In the future, the EU faces a growing commercial presence and critical reliance on China's most competitive IT players. The protection of intellectual property in research and other new regulatory challenges in the management of interconnected digital markets will emerge as major challenges in the future [5].

EU faces a direct challenge from China's digital power in cybersecurity. European companies and governments have been subjected to commercial espionage and cybercrime from Chinese institutions. The growing presence of major Chinese ICT providers creates significant uncertainties and potential risks to the security of EU member states [5].

With regard to the situation in Ukraine, and due to increasing share of the introduction of information technology in economic processes, technology is beginning to play a significant role in the growth of Ukraine's economy. For example, the annual growth of IT shows 40% growth,

but Ukraine needs to speed up the adaptation of its legislation, because, for example, neighboring Belarus shows 100% growth annually. One of the main roles in the introduction of information technology in economic processes was played by specialists in this field. At the end of 2014, Ukraine took second place in the Bench Games international competitions in terms of programmers' qualifications. The Ukrainian economy is experiencing a technological boom due to the training of qualified programmers. The development of information technology in accordance with the needs of economic processes is fast, for this there are all the elements of building a technical and innovative economy [14; 15; 16; 18].

During 2008–2016, exports of IT services grew steadily, while import operations were in the same place. There is a significant share of growth in the national economy of the IT sector as one of the driving forces of the national economy. Public interest in training in this area is growing in order to create services and products and make some profit.

According to Forbes analysts, there are six vectors for the development of information technology in Ukraine [17]:

1. IT-outsourcing – it is a change in the functions of the internal division to use the services of another company, which aims to perform a certain functionality of the company or for a certain period of performance of a particular service. Ukraine is an outsourcing market as one of the competitors of such leaders as India, China, Russia and Eastern Europe. According to the analytical data of the Cabinet of Ministers Information and Analytical Bulletin, Ukraine ranks first in the price of outsourcing and IT specialists. In 2014, the government announced a new program to create 100 thousand new jobs in the IT sector of Ukraine.

2. R&D sector. Foreign companies prefer to open offices in Ukraine, mostly the creation of research centers (R & D centers). More than 100 centers of international corporations of such companies as NetCracker, Aricent, SysIQ, Wargaming, Siemens, Magento, ABBYY have been opened.

3. Electronic commerce. The e-commerce market in the country is growing at about 2 billion USD, but this process is slowing down the uncertainty of regulators of payment instruments. But a positive factor was the adoption of a law regulating e-commerce.

4. Startups. Special attention should be paid to such startups as Petcube - a device for caring pets, iBlazr - a flash for smartphones, CheckiO - an online site with games for programmers, VOX - an audio player for Mac OS, Public Television.

5. IT in public sector (governmental sector). The introduction of information technology in public authorities, however the modernization of existing systems requires significant investment.

6. Telecommunication. National telecom operators have been emphasizing for 10 years that there is no full-fledged 4G communication in Ukraine. To solve this problem, it is necessary to transform ineffective regulatory policy into a modern mechanism that regulates modern demands and responds to endogenous and exogenous factors. [15; 16; 17; 18].

According to European Business Association research, exports of computer and information services for 6 months of 2017 increased by 18.3% (to 1.256 billion USD) compared to the same period in 2016. It is also worth comparing the following indicators: in 2014, exports amounted to 2042 million USD, in 2015 - 2105 USD, in 2016 - 2310 USD. The increase is mainly due to the 7% growth of specialists in this field, as well as the adoption of the bill № 4496 on the simplification of exports of services. Tax revenues from software development and computer services amounted to: 3 million UAH in 2014, 4.5 million UAH in 2015, and 5.8 million UAH in 2016. An audit firm of the Big Four PwC conducted an independent macroeconomic study. According to the results, within the positive scenario, the IT sector will generate up to 27.2 billion UAH in revenue in the coming years [15; 16; 17; 18].

Ukraine's position in the ranking of the Global competitiveness index is: 2012-2013 - 73rd place, 2013-2014 - 84th place, 2014-2015 - 76th place, 2015-2016 - 79th place, 2016-2017 - 85th place, 2017-2018 - 81st place. These figures indicate only minor changes for the better. The development of information technology in Ukraine needs to be intensified for greater growth of economic indicators.

The presence of the information component in the economic system makes it competitive. The use of information technology is an indicator of the way to optimally meet the needs of all economic participants of the economic system. Currently, there is a wide range of information tools responsible for software applications for optimization of economic processes, information resources, software for creating new business opportunities, accounting for all parts of economic processes [1; 2].

The introduction of innovations will be a determining factor in achieving greater economic progress of the country, which may harm global innovation. Localization of investment harms global innovation and information technology at the level of the national economy. According to the results of comparing countries in terms of innovation, their innovative capabilities and the

results of their work in this direction, the latest information technology can affect the national economy as the main driving force or factor in its slowdown

Directing investment in R&D, education or state tax incentives for innovation contributes to positive results in terms of the global knowledge system and the active development of information technology at the state level. The table 4 shows the rank of Ukraine and other countries in terms of innovation according to the Index of global involvement to innovation.

Ukraine rank is 52nd. The main factor preventing our country from rising to higher positions is the extreme mercantilism regarding the introduction of innovations, as a result of which many ideas do not overcome the path from birth to implementation. However, there is every chance to change course, as Poland has done, and to involve the maximum number of ideas in certain projects.

Market conditions encourage all participants in the national economy to maximize innovation in various sectors of the economy. Analysis of economic processes shows that domestic policies, such as support for scientific and engineering labor, entrepreneurial culture, public investment in research and favorable tax treatment for R&D, promote innovation and implementation of information technology in economic processes and other areas of society.

When implementing information technologies at the national level, it is necessary to distinguish three types of implementations of information technologies within the state [4; 11]:

- Government to citizens, or G2C – relations between citizens and the government of the State, which aims to simplify the level of communication between them;
- Government to business, or G2B – the relationship between government and business, where the main purpose of the introduction of information technology is to simplify administrative services for business and communication in solving various problems;
- Government to government, or G2G – increase the efficiency of information exchange and reduce the dominance of the hierarchical component in obtaining information between government structures.



Table 4

**Rank assessments of innovation impact on global systems [15]**

Rank	Country	Type	Final assessment	Cooperation assessment	Estimation of lag
35	Poland	EU Up and Comer	-2.4	-6.1	3.0
36	Bulgaria	Innovation Follower	-5.0	-5.0	-3.9
37	Turkey	Innovation Mercantilist	-7.2	-4.8	-8.6
38	Romania	Innovation Follower	-7.7	-9.8	-3.0
39	Malaysia	Innovation Mercantilist	-7.9	-2.5	-13.1
40	Chile	Innovation Follower	-8.1	-10.9	-2.7
41	Brazil	Innovation Mercantilist	-8.3	-3.2	-12.9
42	Russia	Innovation Mercantilist	-8.9	-0.7	-17.4
43	Greece	Innovation Follower	-10.5	-15.4	-1.5
44	China	Innovation Mercantilist	-10.5	0.7	-22.6
45	Columbia	Innovation Follower	-11.0	-15.5	-2.5
46	Costa Rica	Innovation Follower	-11.3	-16.7	-1.5
47	Philippines	Innovation Follower	-12.1	-13.6	-7.3
48	Peru	Innovation Follower	-12.2	-13.6	-7.4
49	Vietnam	Innovation Mercantilist	-12.9	-8.1	-16.2
50	Mexico	Innovation Follower	-13.5	-16.7	-6.1
51	Kenya	Innovation Follower	-13.7	-14.9	-8.8
52	Ukraine	Traditional Mercantilist	-14.6	-14.3	-11.5
53	Thailand	Innovation Mercantilist	-14.8	-5.6	-23.3
54	India	Innovation Mercantilist	-15.5	-8.3	-21.2

The current state of public authorities in the implementation of information technology does not require significant budgets. The main component of informatization of the government is the modern demand of society for socio-economic and socio-political relations. What is important is not so much the technical component as changes in the regulatory framework and the transformation of organizational procedures, the leveling of resistance of officials. According to the analytical data of the United Nations, in the ranking E-Government Development Index-2016

(EGDI) Ukraine ranked 62nd among 193 countries, improving its position by 25 points compared to 2014, and this figure is higher than the world average, but lower among European countries

According to the ranking, the leaders are the United Kingdom, Japan and Australia. China, Mexico, Serbia and Montenegro moved to the top 25, while Ukraine, Bulgaria, Mauritius, Vietnam, Azerbaijan and Uzbekistan strengthened their places in the top 50.

Highlighting the main aspects and current domestic trends in the development of the e-commerce market, it should be noted the following: 1) most economic relations between economic entities and their customers are carried out in the e-commerce market through the Internet; 2) the platform for the functioning of the e-commerce market is a web-site; 3) the permanent economic relations are transactions for the purchase and sale of goods and services, secondary transactions are aimed at providing the entities that form the infrastructure for economic entities on the Internet; 4) the main actors in the market are business units and customers.

In our opinion, it is necessary to conduct a more detailed analysis, which will allow to display the picture of the impact of IT on the national economy, using PESTLE-analysis (Fig.1), ie extended PEST-analysis, and SWOT analysis (Fig. 2).

Politics	Economy	Social sphere
<div>1. State support of the regions.</div> <div>2. Future changes in legislation.</div> <div>3. Government policy.</div> <div>4. State regulation of competition.</div> <div>5. Trade policy.</div> <div>6. Regulatory tools.</div> <div>7. Grants and government procurement.</div> <div>8. Anti-inflation policy.</div> <div>9. State lobbying</div>	<div>1. Economic situation.</div> <div>2. Inflation rate.</div> <div>3. Investment business climate.</div> <div>4. Taxation.</div> <div>5. Qualification of personnel.</div> <div>6. Employment.</div> <div>7. Stability of the national currency.</div> <div>8. The price of foreign currency.</div> <div>9. The price of energy</div>	<div>1. Demographic situation.</div> <div>2. Revenue structure.</div> <div>3. Basic values.</div> <div>4. Lifestyle of the population.</div> <div>5. Model of population behavior</div>
Technology	Ecology	Legal sphere/Law
<div>1. Development of technologies.</div> <div>2. R&amp;D funding.</div> <div>3. Dependence of technologies.</div> <div>4. Interchangeable technologies.</div> <div>5. Level of adaptation to new technologies.</div> <div>6. The potential of innovation.</div> <div>7. Technology transfers.</div> <div>8. Availability of research centers</div>	<div>1. The ecological situation in the region.</div> <div>2. Protection and environmental protection.</div> <div>3. Natural disasters</div>	<div>1. Labor Code.</div> <div>2. Regulations and legal authorities.</div> <div>3. Legislation in the field of regulation of information technology</div> <div>4. Tax Code</div>

Fig. 1. PESTLE- of the use of information technologies in the national economy (*developed by the authors*)

Thus, there is an environment for such a new form of economic activity as e-commerce, but it is at the beginning of its development. The introduction of information technologies and their development should be based on a set of State mechanisms, covering the regulatory, technical, organizational capabilities of e-commerce. According to the abovementioned facts, the transition to e-commerce should be based on such principles as: unification of standards for the

introduction of e-commerce, introduction of self-regulatory tools, and harmonization of the right fields based on transformational changes in socio-economic relations [1;2].

Strengths	Weaknesses
<div>1. Highly qualified personnel in the IT sphere.</div> <div>2. The presence of a positive reputation of Ukrainian programmers.</div> <div>3. Ukrainian youth.</div> <div>4. A large number of certified specialists.</div> <div>5. Geographical location.</div> <div>6. Work style - focus on achieving goals.</div> <div>7. High growth rates of the IT market</div>	<div>1. High level of corruption.</div> <div>2. Small investment growth.</div> <div>3. Outflow of IT personnel to other countries.</div> <div>4. Non-adaptation of the legislative field to the needs of the IT market.</div> <div>5. Low level of internal costs of IT market.</div> <div>6. Lack of investor protection mechanisms</div>
Opportunities	Threats
<div>1. Low price of the national currency relative to foreign currency, including the dollar and the euro.</div> <div>2. Integration process with the European Union.</div> <div>3. Transition from outsourcing to product.</div> <div>4. Consolidation of the market.</div> <div>5. Low staff turnover</div>	<div>1. Economic recession.</div> <div>2. Antiterrorist operation.</div> <div>3. Outflow of qualified personnel</div>

Fig. 2. SWOT-analysis of the use of information technologies in the national economy  
(developed by the authors)

Supporting resources, such as human resources, for the IT sector in Ukraine have high indicators, but if we take the IT sector in general, Ukraine is at the level of African countries. The phenomenon of Ukrainian IT staff is known all over the world. For example, a top manager, the head of Microsoft S. Ballmer stressed that Ukraine has highly qualified personnel; however, their impact on the national economy is insignificant, because most of them work for foreign customers [3; 4].

The formation of the e-commerce sector as an important component of improving the economic performance of the national economy in the IT sector is a step forward. Today in Ukraine there are no established relation and cooperation "science-technology-production", so to establish new social and economic relations, for example, e-commerce aims to create clusters, according to their capabilities and demands.

Digitalization of economic processes of the national economy (Fig. 3) acts as the implementation of measures to change relations between economic entities, the state and citizens of Ukraine. The importance of the principles that implement digitalization in the economic processes of the national economy of Ukraine is significantly increasing, as the level of collaboration of all participants in this process depends on them.

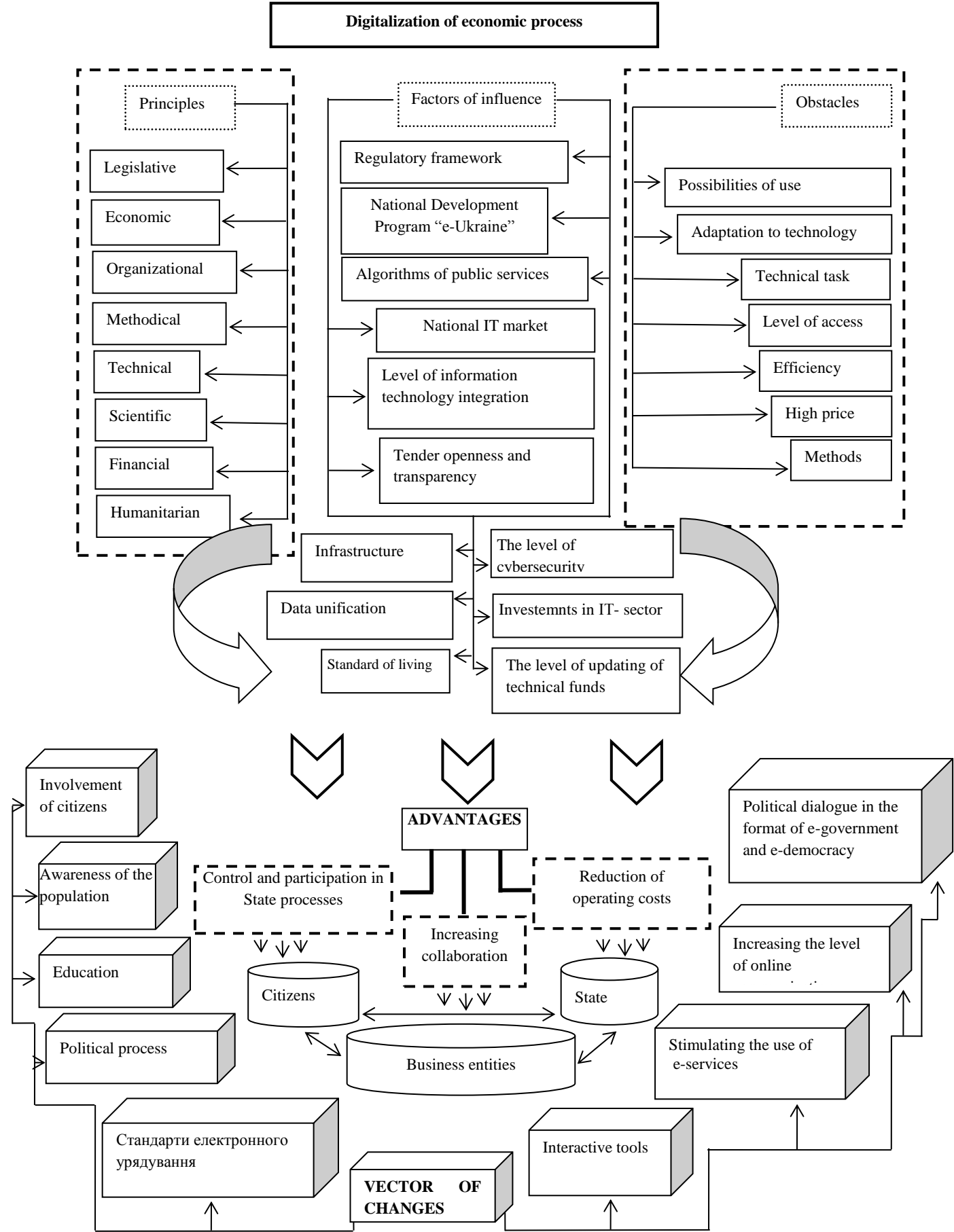


Fig. 3. Digitalization of economic processes (developed by the authors)

However, we should not forget about the presence of factors (characteristics of the information sector of the national economy, state mechanisms) and obstacles that may arise in the process of transformation of economic processes by information technologies that form the basis of the national economy of Ukraine.

The main advantages of digitalization are more effective involvement of citizens in control and participation in economic processes of the national economy, increased collaboration between the State, citizens and businesses and reduced operating costs, which will significantly affect the State budget through the use of the budget costs for other urgent needs. Therefore, the main vector of change will be as follows: public awareness, intensification of civic participation in State-building processes, education, political process, active use of e-services, increasing the level of communication, changes in approaches to democratic dialogue between all participants in the economic processes of the national economy through the use of digitalization tools.

According to digital agenda the main trends of economic processes in the national economy could become:

1. Data that are the main source of competitiveness. The collection, description, storage and processing of data make it possible to obtain appropriate information for the conduct of optimal economic relations, to establish socio-economic and socio-political relations. The main access to data is via the Internet, a lot of data becomes open.

The main obstacles for the development of this trend in economic processes of the national economy:

- Lack of a system of rules, regulations, standards for data collection, classification, storage and use (national, regional, sectoral and other levels);
- Problems of intellectual property protection;
- Data protection problems, cybersecurity risks;
- Lack of citizens' competencies in working with data (digital skills), relevant education, professions, etc.

Opportunities created by the trend for Ukraine:

- Development of a new sector of the economy, new jobs;
- Creating a basis for the development of other industries and "digital" economy;
- The emergence of an effective management tool;
- Creating an environment that prevents corruption as a phenomenon.

2. Development of the Internet of Things. This trend is characterized by the interaction between physical objects or devices that have sensors and sensors, as well as software that allows you to work and exchange data on the Internet. The approach taken as the basis of the concept of the "Internet of Things" provides an opportunity to increase the socio-economic and socio-

political indicators of life of citizens of Ukraine, as well as to optimize the work of civil service, utilities and reduce production costs. Approximate estimate of working devices.

This fact indicates the creation of a new market for products and services through the active use of artificial intelligence and machine learning (machine learning), because it is possible to use new tools in business processes and measure new labor resources in the near future.

The main obstacles to the development of the “Internet of Things”:

- Lack of information about the latest technologies that will help reduce costs and increase efficiency; low number of R&D, development, innovation, and existing startups in most cases focus exclusively on foreign markets in terms of commercialization and jurisdiction;
- Low level of adaptation of modern education to modern demands as a result of specialists and engineers in the field of “ Internet of Things ”.

The opportunities created by the new sphere of the “Internet of Things” within the national economy are as follows:

- Increasing the efficiency of the small and medium business sector, etc.;
- Incremental transformational innovations, development of relevant world-class products by Ukrainian companies;
- Improving the efficiency of production, business organization, logistics, transport.

3. Digitization, or digital transformations. There is a transformation of modern economic processes and the transition from industrial to information economy. These processes of transformation of economic processes within the national economy form new essence and purpose of values (for example, Uber, Airbnb, digital banking, etc.). Active use of outsourcing services in the development of new products and business services, production and rapid prototyping gives small companies the opportunity to develop new products and compete with large companies. Transformation processes have shifted innovation centers from large companies to small ones.

The main barriers to the development of economic processes in the framework of digital transformation:

- Lack of governmental support and proper infrastructure to develop innovative business and entrepreneurship;
- Lack of a clear vector of development of national systems and infrastructural support for the digital transformation of the national economy;



– Lack of mechanisms to stimulate and motivate the development of innovations, in particular in small and medium enterprises.

Opportunities created by the trend for Ukraine:

- Increasing the competitiveness of economic sectors;
- Development of digital economy, labor market etc;
- Emergence of new industries (cross - platform with digital industry);
- Dissemination of innovative entrepreneurship.

4. Dissemination of business models based on the ideology of the "shared" economy.

Economic processes are changing their approaches due to new economic relations for the integration of information technology. The use of “shared” platforms makes it possible to quickly implement and commercialize ideas in the material and technical constraints of most companies.

Opportunities created by the trend for Ukraine:

- Easy start-up of new businesses, as it does not require large initial costs;
- Development of service models, impact on the efficiency and competitiveness of Ukrainian business without significant investments;
- Opportunities for business beginners;
- Rapid launch of commercial Internet projects, creation of new marketplace, expansion of markets for consumption of Ukrainian products, services and labor resources, commercial globalization.

5. Virtualization of physical infrastructure IT-systems and transition to service models. Due to the boom of intellectualization, it is possible to reduce the amount of capital expenditures for the creation of digital infrastructure, using "cloud services" technologies and software-defined architecture. This technology allows to use computing capabilities and services by paying only for this service. Customers of "cloud services" have full access to services for a certain period of time, which they paid for, all information is protected on a technological basis.

Opportunities created by the trend for Ukraine:

- Business, enterprises, government agencies and citizens have the opportunity to quickly and cheaply deploy the necessary digital infrastructure and take advantage of the digital world;
- Effectively develop the country's digital infrastructure as the basis of the digital economy.

For the development of the national economy with the help of information technology it is also necessary to focus its efforts on the following areas of cooperation:

1. Interoperability and eServices. A great attention is given to the EU Program of Interoperability Solutions for European Public Administrations 2 (ISA2), the projects e-CODEX, e-Invoicing, and Single Digital Gateway Initiative. Currently, economic relations in the framework of electronic interaction of state information resources and the development of interoperability is the main challenge for all participants in the informatization of social and economic and social and political relations. The Resolution of the Cabinet of Ministers of Ukraine “Some issues of electronic interaction of state electronic information resources” is a positive indicator which proves the participation of the State in European programs. The purpose of the Resolution is integration of the system of electronic interaction of the state authorities, electronic systems and resources and provide with an access to full interaction according to the EU requirements, such as European Interoperability Framework 2.0. An active participation in ISA2, e-CODEX and e-Invoicing will provide an opportunity to ensure compliance with modern requirements of the European Union (formats, standards, regulations, technical solutions) and accelerate the country's European integration.

2. Electronic identification (eID), introduction of new regulations eIDAS, international electronic identification and authentication, active participation in the project EU Stork 2.0. Development of secure accessible and convenient electronic identification is the main goal of introduction of electronic e-commerce services. It will also enable acceleration of the new economy development in the framework of information technology introduction. The Project Secure identity across borders linked 2.0 (Stork 2.0) will provide with an opportunity to create a common environment for electronic identification and authentication in the EU. The project is aimed at creation of standards, formats, and identification for integration of interoperable electronic identification tools, especially in e-medicine, electronic public services, e-banking, and EU Digital Single Market development, cross-border cooperation.

3. Open Data. In January 2016, the first version of the State web portal data.gov.ua was launched to provide a roadmap approved in February 2016 and provides for 41 tasks in 5 areas. It provides an opportunity to develop an EU open data policy, the only high standards for open data [15].

**Conclusions.** Thus, according to the presented material, information technologies are a factor influencing fundamental role in formation of new qualities of the society, especially its economic relations within the national economy. Due At the same time due to fierce competition, the

functioning of the network economy as an integral system information technology undergoes a rapid development and up-grading and changes its approaches to economic activity on the Internet. Adaptation to changes requires significant tangible and intangible resources, which is one of the negative factors in the integration of new information technologies into the economic environment of the country.

Thus, summarizing the abovementioned material, it can be argued that the introduction of new digital technologies can have significant productivity implications for companies that successfully integrate these technologies into their operations..

The national economies of the world compete fiercely for advanced industrial leadership. Countries will need to implement a comprehensive national strategy for the digitalization of production and make the necessary investments if they are to be competitive in the global digital market.

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**PARTICULARITIES OF ECONOMIC DEVELOPMENT OF ENTERPRISES OF  
PUBLISHING AND PRINTING COMPLEX**

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**Abstract.**

The priority directions of development of enterprises of the publishing and printing industry are substantiated, namely, diversification of activity of enterprises, corporatization, investment in innovative development. Necessary transformations in enterprise management are defined for these directions. The key production factors in the quality management process are established, taking into account the customer-oriented approach. The principles of effective functioning of the edition of virtual publishing houses are substantiated. The directions of intensification of investment activity are determined.

**Keywords:** investment development, innovation, diversification, corporatization, development management, virtual publishing.

## INTRODUCTION

Perspective directions of enterprise development are determined on the basis of the analysis of features of concrete branches (publishing and printing branch), the level of its competitiveness, the factors influencing development of the enterprises of this branch. In the context of digitalization of communications, publishing and printing companies are losing the market for traditional printed products, while progressive managers have built and implemented a strategy of integration into the new digitalized information environment. This does not diminish the need for continuous improvement of established activities, improving the quality of service to existing customer bases, on the contrary, there are opportunities for a new combination of factors of production, supply of new goods and services, access to new markets.

## MATERIALS AND METHODS

The application of specific research methods is justified by the need to provide relevant proposals for improving the management of the development of enterprises in the publishing and printing industry. The method of content analysis allowed us to explore the sources of investment and the main directions of use of investment funds, as a consequence, to justify the criteria for effective use of investments. The method of analysis and synthesis applied to study areas of diversification of enterprises, and based on them offer such diversification, that the most relevant with current operating conditions sub ' objects of publishing and printing industry. The forecasting method is used to assess the possibilities of attracting own investment resources of enterprises in the future.

## RESULTS

### 1.1. The main directions of development of printing enterprises

For effective management of enterprise development, we have identified the following main areas:

- Diversification of enterprises;
- Change in the organizational structure of enterprises on the basis of their corporatization;
- Investment development.

At the present stage of development of printing companies, these areas will increase the efficiency of enterprises and the industry.

The justification for the diversification of activities as a direction of efficiency was determined by the fact that the industry is dominated by small and medium-sized businesses, which do not function effectively in today's competition and reduce demand for products in the printing industry. Therefore, an effective direction, established by the results of the analysis, can be the diversification of enterprises on the basis of its expansion.

Thus, the analysis of the international experience of publishing and printing enterprises of different countries for example, Poland, Finland, Canada, USA, China, showed that their activities are associated with diversification and the creation of associations of a certain type.

Diversification at printing enterprises with the expansion of activities will be facilitated by such factors as preferential taxation of enterprises, the provision of state support to the publishing business. Also, for effective diversification it is necessary to modernize the material and technical base of enterprises on the basis of innovative development in terms of increased investment, improving product quality, and for this it is necessary to improve skills, the level of material incentives and more.

The type of diversification depends on the conditions and objectives of enterprises. As the analysis showed, it is expedient to introduce horizontal and mixed diversification in printing, as the urgency of horizontal diversification in modern conditions is associated with a change in the market structure of printing products. Diversification measures will ensure the utilization of existing production capacity, expand the market, reduce the seasonality of production, reduce market risk. Mixed diversification is important, which will help control the chain of publishing and printing complex: order-supply-production-sales, and this helps to reduce the costs of enterprises.

Diversification will be most effective for companies that have their own sources of development. Own sources are net income and depreciation.

It is possible to introduce conglomerate diversification in some printing companies, which is not technologically related to the main production, but this type of diversification has a limited

scope, as it requires significant investment in the development of a new line of business, which is not typical for small businesses.

As a direction of enterprise development, diversification of activities requires the solution of such tasks related to the organization of management, namely:

- Determining the compliance of the existing organizational structure with the tasks of enterprises to be solved taking into account the implementation of diversification;
- Distribution of production functions between units in order to effectively diversify;
- Substantiation of material incentives for high-quality performance of functions.

Horizontal diversification expands the tasks of individual structural units. Additional tasks are connected with marketing activity in connection with search and substantiation of perspective directions of activity of the enterprises, development of programs of commodity promotion; the need to design the technology of manufacturing a new type of product on the basis of appropriate quality standards; preparation of feasibility study of areas of diversification and evaluation of their effectiveness.

The application of a comprehensive approach to the diversification of activities requires the expansion of the range, the introduction of new technologies, changes in management. Improving the organization of management is associated with the introduction of program-targeted organizational management structures, quality management systems, which contributes to improving quality, product competitiveness, increasing the level of profitability. The organization of reception of orders with use of a new means of communication - the Internet provides efficiency of production, promotes increase in demand for production of the enterprises. Improving the organization of marketing activities on the basis of receiving orders using the means of communication - the Internet, in modern conditions requires the introduction of automated systems CRM (Customer Relationship Management) accounting and analysis of customer relations.

The decision to change the organizational structure of enterprises must be made taking into account the economic feasibility of transformations. The effect of diversification is assessed directly - it is an increase in profits, or indirectly - on the basis of cost savings. Conventional fixed cost savings are determined by the formula:



$$S_{fc} = C_p \cdot P_{fc} \cdot \left(1 - \frac{I_{fc}}{I_p}\right), \quad (1)$$

where  $C_p$ - cost of production in the base period;

$P_{fc}$  - the part of fixed costs in the cost of production;

$I_{fc}$ ,  $I_p$ - respectively, the index of fixed costs and the index of volume of production.

The growth of production will increase the volume of orders for materials, which makes it possible to obtain a discount from suppliers, cost savings on materials are calculated as follows:

$$E_M = C_p \cdot P_M \cdot (1 - I_{mp}), \quad (2)$$

where  $P_M$ - the part of material costs in the cost of production;

$I_{mp}$ - material price index.

In terms of declining demand for printing products, a promising area of development of printing companies, as already noted, is the diversification of activities, and in terms of funding shortages, preference should be given to horizontal and mixed diversification in order to develop competitive advantages.

To increase the efficiency of enterprises, we offer on the basis of diversification of their activities and their own sources of investment a more perfect form of organization, as corporatization. Changing the organizational structure of enterprises will modernize production, increase the use of production capacity, certify products according to international quality standards to increase their competitiveness, ensure access to international markets.

The main characteristics of such areas of development management as business diversification, corporatization and investment are given in table 1.

**Table 1**  
**The main characteristics of the areas of improvement of development management of printing companies**

Diversification of enterprises	Corporatization	Investment
<ul style="list-style-type: none"><li>- Reloading of existing production facilities;</li><li>- Development of new markets;</li><li>- Distribution of risk between separate areas of activity</li></ul>	<ul style="list-style-type: none"><li>- Change of organizational structure;</li><li>- Access to new resources, technologies;</li><li>- Improvement of the chain "order-supply-production-sales";</li><li>- Increasing the scale of activity with a constant range;</li><li>- Distribution of risk between the members of the corporation</li></ul>	<ul style="list-style-type: none"><li>- Rational use of own sources of financing;</li><li>- Reduction of investment risk;</li><li>- Innovation orientation</li></ul>

In the chain of activity of the publishing and printing complex, as the analysis showed, there is no connection between supply and demand, the customer and the publisher, the manufacturer and the seller. The customer, who may be the author or the enterprise, the institution that orders the creation of the publication, enters into an agreement with the publisher on the production. The author, as a customer, aims at self-realization and economic and social benefits, cooperates with the publisher, usually without prior study of the demand for the publication, which increases the risks of the publishing project. A printing company that replicates publishing products has no direct interest in the commercial success of publications. The purpose of the manufacturer and seller of products is to obtain economic benefits in the short term, which is complicated by the lack of communication between them to form a range based on consumer demand.

In modern conditions, publishers compete with each other, attracting both customer authors and consumers, and the effect of competition depends primarily on product quality, which is determined by the components, indicators, subjects of quality assurance (Table 2).

**Table 2**  
**The essence of the components of the quality of publishing products**

Quality component	Quality indicator	The subject of quality assurance
<i>1</i>	<i>2</i>	<i>3</i>
Information	Content of the publication and relevance	Author (customer)
Information and technical	Quality of edition processing, graphic design, readability	Publishing house
Technical	Accuracy of reproduction of the publishing original, observance of quality standards	Printing company
Service	Commodity type of publication, product range, advisory support	Book trade enterprise
Complex of components	Individual perception of quality	Consumer

An important role in shaping the demand and culture of consumption of publishing products belongs to the subject of quality assurance - it's customers (authors) or publishers, who must provide relevant content and quality presentation of textual and graphical information. Quality also depends on the technical parameters that are designed by publishers and embodied in the circulation of publications by printing companies, taking into account product quality standards. The final purchase decision is made by consumers, based on the quality indicators of publications provided by customers (authors), publishers, printing companies, as well as the level of service by booksellers, respectively, consumers take into account general indicators and individual perception of quality.

As the analysis showed, the participants in the chain customer-manufacturer-seller-consumer do not cooperate enough and, as a result, do not fully use development opportunities. Therefore, it is advisable to corporatize enterprises. Given that the structure of the enterprise and the volume of orders will change, we can conclude that the mixed diversification of enterprises.

Since we have determined that the most acceptable organizational form of enterprises is a corporation, we will consider its advantages. The creation of associations of enterprises aims to increase the competitive stability of enterprises due to the scale of production, the main purpose of diversification is to increase profits through the development of new markets.

Corporatization involves maintaining the legal independence of the participants, which is required in connection with the peculiarities of publishing and printing companies, which have their own material and technical base and market. Publications, as a product of intellectual work, require high-quality information content and design, which depend primarily on the qualifications of employees, and the quality of printing is assessed mainly by technical parameters, which are more complex and depends on many factors, namely the quality of materials, technical and technological level, qualifications of performers, etc., as well as requires greater investment.

The creation of corporations will be based on an integrated structure to effectively achieve goals and solve common problems. The functioning of corporations involves the development and harmonization of basic provisions for their creation and operation. Given that corporations provide a mutually beneficial business partnership, to ensure the effective operation and development of corporations, it is necessary that there be common economic rules for their activities, real investment, as well as the joint formation and use of resources.

Uniform economic rules in corporations must first be established regarding the price and payment for services provided by participants. Thus, the experience of Poland is interesting, which provides for the establishment of retail prices for book products by publishers, thus, profit maximization by booksellers is achieved by regulating the purchase of books to obtain a discount or improve activities to reduce current costs. It is possible to develop a common pricing policy based on the adaptation of the German experience, which at the same time ensures the coordination of assortment policy. To balance the interests of partners, it is advisable to stimulate the production and sale of publications on paper, for this purpose, printed publications go on sale, usually a month earlier than electronic, and the difference in price does not exceed 15%. If the publishing house offers in the market editions in electronic and printed formats, they should be kept when it becomes a member of the association, despite the fact that for the printing company to load production capacity is more relevant to produce printed products.

The association has additional opportunities to set price discounts, as placing orders on one production base helps to reduce fixed costs, and the price discount is determined in proportion to the amount of cost savings.

The corporation's activities need to improve the payment policy, as at the present stage of development is common among publishers is cooperation with booksellers on terms of payment for the sale of publications to end users, which causes a shortage of funding for current activities.

To achieve balanced development, enterprises need to pay more attention to their social development. In order to implement this function in the association, as the analysis showed, it is advisable to provide more favorable payment terms for publishers, namely, reduction or cancellation of their advance payments, as well as deferral of payments to printing companies for printing publications.

The joint formation and use of resources in corporations is primarily appropriate for the joint use of information on the results of marketing research of printing and book trade enterprises on the actual demand and unmet needs and providing this information to publishers to improve product range policy; research of publishers on the most popular publications on the market and factors of competitiveness. Sharing information resources will help improve the product policy of the association members. Create corporations need to improve promotion, provided joint development by publishers, printing and bookselling business measures of promotion, manufacturing advertising printed products, exhibition activities, online promotion and so on. It is necessary to control the quality of information.

The main motives for the creation of corporations are the search for ways to improve the efficiency of enterprises, promising areas of investment, expanding the market.

On the basis of certain motives the composition of potential participants is substantiated, it is expedient for partners to involve those who will strengthen or expand competitive advantages of association and will provide reception of economic effect. It is advisable for printing houses to form associations with publishing houses that have highly qualified staff, commercially successful publishing projects, a significant market share, use innovative technologies, ensure high quality products and focus on consumer demand. Corporations may involve booksellers, preferably network or wholesale, with a wide geography of sales and a high level of payment discipline, which will reduce sales costs, accelerate capital turnover.

Determining the goal, setting the tasks of corporations is based on the analysis of external and internal environments, as it allows to identify the competitive advantages of enterprises, the possibility of their implementation and assess the prospects for market development. The purpose of creating corporations is justified taking into account current and future conditions of development and is defined as increasing profits, maintaining or expanding market share, creating new markets. Among the participants of the publishing and printing complex, publishing houses are responsible for the entire chain of quality and value formation from the moment of creation of publications to their implementation.

The cooperation of the participants on a permanent basis will ensure the gradual solution of the tasks of loading the capacities of the enterprises of the printing industry, and for the publishing houses - finding the production base for the reproduction of books.

An important issue in the creation of associations is product quality management. At association on the basis of integration of the enterprises conditions for increase of quality of production are created. The formation of product quality begins at the stage of its design, so it is advisable for publishers to involve printing technologists in the design of publications, and not later - when transferring original publishing layouts to printing houses, as revealed by the analysis of their activities. At the stage of designing some types of printing products, it is expedient for polygraphist enterprises to establish cooperation with publishing specialists. Thus, the current state of development of the printing market is characterized by an increase in the share of unincorporated personalized orders, in particular, for the production of photo books, collections of children's drawings and more, and a promising area to increase the competitiveness of these products is publishing.

In the corporation to avoid duplication of functions, publishing houses-members of associations should delegate to printing companies the power to choose suppliers of paper, cardboard, which will save costs on materials by increasing the volume of purchases of materials.

According to the analysis, the most acute issue is the sale of products due to the low level of development of the book trade network, so for publishers and book trade enterprises it is advisable to integrate on the basis of long-term cooperation for the sale of publishing products.

An effective modern direction of development of corporations, which will include printing companies and publishing houses, is the creation of virtual publishing houses on the basis of attracting specialists for the duration of publishing projects and their remote work. We have

substantiated the main motives for creating virtual publishing houses on the basis of printing companies, such as:

- Expansion of activities in order to increase income and profits;
- Loading of free production capacities;
- Development of a new line of business without the involvement of employees on a permanent basis;
- The possibility of publishing a wide range of publications by involving literary editors of the relevant specialization during the implementation of projects;
- Reducing the time of preparation of publications on the basis of attracting more staff;
- To reduce fixed costs for production, namely, for the maintenance and operation of equipment and premises, for wages;
- Ensuring a competitive price due to the fact that it will include only the profit of the printing company, and not both the profit of the publisher and the printing company.

The peculiarity of virtual publishing is that all editorial and publishing processes, cooperation with the author are mediated through the project manager, which avoids duplication of work, promotes a single concept of the publication, as well as customer-oriented approach, because in preparing the author cooperates with only one person.

The head of the publishing project performs the following tasks: forms the publishing portfolio on the basis of cooperation with the authors; develops instructions for the preparation of publications; determines the optimal number of staff, taking into account the urgency of publications; performs personnel selection for creation of working groups; determines the actual circulation of products; cooperates with authors and working groups on the preparation of publications, is an intermediary in production communications between them; provides the working group with computer programs for the preparation of publications in case of need.

For each publication selected for preparation, the project manager draws up an instruction, which contains the terms of preparation of the publication and coordination of spelling rules, which may be different from the experts involved in the project. The manuscript and instructions are submitted to one or more literary editors, who review the author's original and make suggestions to the project manager for revision by the author. To ensure quality preparation of publications, to minimize errors, it is necessary to perform proofreading of originals several times, and in case of involvement of several editors to organize cross-checking. Ensuring the

quality of publication preparation is also due to the appropriate selection of the project manager or team of executors for each new publishing project, and this determines the effectiveness of activities.

The creation of corporations, the introduction of modern methods of work will reduce production time and market entry, will increase its competitiveness, which requires consideration of the product life cycle, which in modern conditions is short and depends primarily on demand and supply.

## 1.2. Investment development as a basis for effective activity of enterprises

The activity of enterprises depends on their financial security, the main areas of use of funding sources. The main indicator that characterizes the efficiency of enterprises is profit. At the same time, profit and depreciation are own sources of financing for enterprises. Analysis of the financial condition of enterprises showed that the printing industry is not attractive for investment, so the main sources of effective investment development of enterprises are their own resources, and the direction of the depreciation fund for its main purpose, i.e. to restore fixed assets, is important for economic growth.

Based on the analysis to determine the prospects for investment development, we calculated the profit forecast of printing companies. This will allow to assess their investment opportunities. Calculated point and interval forecast values of the dependent variable  $y$ . The vector of predicted values of independent factors, which are included in the econometric model, namely, labor productivity, financial autonomy, working capital turnover, is used for forecasting:

$$X_0 = \begin{pmatrix} 1 \\ X_1^{(0)} \\ X_2^{(0)} \\ \dots \\ X_m^{(0)} \end{pmatrix} \quad (3)$$

Then the point forecast for the average value of the regressor is determined by the formula:

$$\hat{Y}_0 = X'_0 \cdot \hat{B} \quad (4)$$

where  $X'_0$  —is the predicted value of  $X$ ;

$\hat{B}$  - regression coefficient coefficients.



The variance of the forecast is calculated by the formula:

$$\sigma_{pr}^2 = \sigma_{oct}^2 \cdot (1 + X_0'(X'X)^{-1}X_0) \quad (5)$$

where  $\sigma_{oct}^2$  – is the variance of the model residues.

Determined square root, get the standard error for the forecast:

$$\sigma_{pr} = \sigma_{oct} \cdot \sqrt{(1 + X_0'(X'X)^{-1}X_0)} \quad (6)$$

In this case, the confidence interval of the forecast of the dependent variable can be represented both for the average value (mathematical expectation) and for individual values for the period. The confidence interval for the average value (mathematical expectation) of the forecast of the dependent variable has the form:

$$\hat{Y}_0 - t_{tabl}(\alpha; k) \cdot \sigma_{pr} \leq M[\hat{Y}_0] \leq \hat{Y}_0 + t_{tabl}(\alpha; k) \cdot \sigma_{pr} \quad (7)$$

And the confidence interval for the individual value of the forecast of the dependent variable has the following form of record:

$$\hat{Y}_0 - t_{tabl}(\alpha; k) \cdot \sigma_{pr(i)} \leq \hat{Y}_0 \leq \hat{Y}_0 + t_{tabl}(\alpha; k) \cdot \sigma_{pr(i)}, \quad (8)$$

where the corresponding standard error is determined from the formula:

$$\sigma_{pr(i)}^2 = \sigma_{oct}^2 + \sigma_{pr}^2 \quad (9)$$

Based on the fact that the calculated error of the prediction of the power function is less than the linear one, the power function is of better quality, so it is advisable to make a forecast by periods on its basis. To do this, it is necessary to calculate the smoothed projected values of regressors X1 (productivity), X2 (financial autonomy), X3 (turnover of working capital) and, performing their substitution into a power function, calculate the point values of profit for each period, and on their basis - interval. The procedure of exponential smoothing of the MS Excel Analysis package was used to construct the point and interval forecast. Exponential smoothing is used to predict the value of the indicator taking into account the errors in this forecast. Pr and analysis using constant smoothing  $a$ , the value of which determines the degree of impact on the forecasts in the previous forecast errors. The most acceptable values for the constant  $a$  are from 0.2 to 0.3, i.e., the error of the current forecast is set at 20 to 30% of the error of the previous forecast. Given that the value of the constant that is greater than the recommended interval can lead to a large value of error, and a smaller value of the constant can cause an extension of the forecast interval, we take for calculations the constant  $a$  at the level of 0.2.

Based on this, independent factors  $X_1$ ,  $X_2$ ,  $X_3$  are predicted to build a net profit forecast. The application of the time series method and exponential smoothing assumes that the trend identified in previous periods will continue.

The forecast smoothed values are calculated taking into account the change of all factors included in the power profit model. Thus, net profit is expected to volatile trend.

Taking into account unfavorable market conditions, namely, inflation, reduction of demand for printing products, the profit forecast of printing companies should be taken at the level of the lower limit of the interval forecast.

On the basis of the forecast the purposes and directions of increase of efficiency of development of the enterprises are defined, the measures which are directed on minimization of threats and use of possibilities of the enterprises, increase of their competitiveness are substantiated.

As the analysis showed, investment development depends on a number of factors, based on which the directions of intensification of investment activity are determined.

To increase the efficiency of investment development, it is advisable to implement a set of areas to intensify investment, including ensuring the rational formation and use of sources of funding, including those involved.

In determining the effectiveness of investment, it is necessary to adhere to the objectivity of the assessment of demand and capabilities of enterprises to meet it, including indicators of product quality associated with innovative development of enterprises, to select optimal investment projects by technical, economic criteria and more, thus, the success of its implementation depends on the correct assessment of the investment project at the planning stage. Therefore, planning, forecasting are important functions of investment development management.

Planning the investment development of enterprises requires the definition of sources of return on investment, the main of which are depreciation deductions, net income, financial costs, which we have systematized in table 7.

**Table 7**  
**Sources of return on investment**

Investment resource	Source of compensation	
	loan prices (rates of return)	principal amount of investment (loan)
Own resources	Net profit *	Depreciation deductions, net profit
Leasing (financial)	Enterprise costs (financial costs)	Depreciation deductions, net profit
Credit	Enterprise costs (financial costs)	Net profit

\* The rate of return of the enterprise is determined by net profit

Given that the price of the loan, leasing is reimbursed by the company, the principal amount of the bank loan is paid from net profit, and the lease agreement provides for the use of an additional source of reimbursement - depreciation, so leasing increases investment efficiency, as it reduces debt repayment comparing with a bank loan.

On the basis of such indicators of efficiency of investment activity, as profit, economic result, we substantiated criteria of an estimation of efficiency of investments for the investigated enterprises, are resulted in table 8.

**Table 8**  
**Criteria for assessing the effectiveness of investment depending on the sources of funding for printing companies**

Source of investment financing	Criteria for evaluating the effectiveness of investments	
	Absolute indicator, total or average for the investment period	Relative indicator
<i>1</i>	<i>2</i>	<i>3</i>
Own resources. Reimbursement of investments due to depreciation deductions	$P > 0$  Positive value of net profit	$\bar{P}_1 > 0$  Positive value of return on investment

<p>Own resources.</p> <p>Reimbursement of investments at the expense of depreciation deductions and net profit</p>	<p><math>ER &gt; 0</math></p> <p>Positive value of the economic result, subject to return on investment</p>	<p><math>\overline{P}_1 &gt; \overline{d}_i - \overline{H}_a</math></p> <p>Excess return on investment, compared with the difference between the share of return on investment per unit period and the depreciation rate</p>
<p>Financial leasing.</p> <p>Reimbursement of investments due to depreciation deductions</p>	<p><math>P &gt; 0</math></p> <p>Positive value of net profit, subject to payment of the lease price</p>	<p><math>\overline{P}_1 &gt; 0</math></p> <p>A positive value of return on investment, if, compared with raising equity, it exceeds the lease price</p>
<p>Financial leasing.</p> <p>Reimbursement of investments at the expense of depreciation deductions and net profit</p>	<p><math>ER &gt; 0</math></p> <p>Positive value of the economic result, subject to repayment of the principal amount of the debt and the lease price</p>	<p><math>\overline{P}_1 &gt; \overline{d}_i - \overline{H}_a</math></p> <p>Excess of return on investment over the difference between the share of return on investment per unit period and the depreciation rate, if compared with the use of own investment resources, return on investment is greater than the lease price</p>
<p>Bank credit.</p> <p>Return on investment from net income</p>	<p><math>ER &gt; 0</math></p> <p>Positive value of the economic result, subject to repayment of the principal amount and the price of the loan</p>	<p><math>\overline{P}_1 &gt; \overline{d}_i</math></p> <p>Excess of return on investment over the average share of return on credit investment resources per unit period, if, compared with the use of own resources, return on investment is greater than the price of the loan</p>

Own resources and bank credit. Reimbursement of own resources at the expense of depreciation deductions, bank credit - at the expense of net profit	$ER > 0$  Positive value of the economic result, subject to repayment of the principal amount and the price of the loan	$\overline{P}_1 > \overline{d_{fl_i}}$  The value of return on investment is greater than the average share of credit resources in the total investment per unit of the accounting period, if, compared with the use of own resources, the return on investment exceeds the cost of credit
Own resources and bank credit. Reimbursement of own resources at the expense of depreciation deductions and net profit, bank credit - at the expense of net profit	$ER > 0$  Positive value of the economic result, subject to return on investment and loan price	$\overline{P}_1 > \overline{d_i} - \overline{H_a}$ and $\overline{P}_1 > \overline{d_{fl_i}}$  Exceeding the return on investment over the difference between the share of return on investment per unit period and the depreciation rate, provided that the average return on investment is not less than the average per unit period of credit resources in total investment, if, compared with the use of own investment resources, return on investment is greater than the cost of credit

When determining the economic feasibility of using credit investment resources, a prerequisite is a higher value of return on investment, calculated on the basis of profit without deducting the payment of the loan price than the loan price. A sufficient condition is the excess of return on investment, calculated on the basis of net income, over the share of loan repayment per unit of investment period. This condition should be taken into account when calculating the market value of enterprises, in particular by the method of economic value added (EVA). Accordingly, the evaluation of investment efficiency is carried out on the basis of absolute and relative criteria that take into account the sources of return on investment. Thus, when reimbursing resources through

depreciation, as an absolute criterion it is necessary to use net profit, and when using net profit as a source, the criterion of efficiency is the economic result. It is advisable to make a relative assessment on the criterion of return on investment, which is defined as the ratio between net income and investment. It should also be borne in mind that during the implementation of investment projects, economic conditions change due to inflation, business risks and other factors that must be taken into account when assessing the effectiveness of investments on the basis of discounting.

Thus, the efficiency of printing companies depends on their investment development, in which innovation is the main form of investment, and investment development is aimed primarily at modernizing the material and technical base of enterprises.

## CONCLUSION

On the basis of the conducted analysis the basic directions of increase of efficiency of development of the enterprises are substantiated:

- promising areas of enterprise development are: diversification on the basis of business expansion, change in the organizational structure of enterprises, investment development;
- corporatization in order to reduce the risk of operation by enlarging the scale, expanding the market, increasing the competitiveness of enterprises and industries. Corporations may include enterprises that are connected with the printing industry in a single chain. This will help reduce the duration of the production cycle, improve product quality, jointly solve a number of problems, especially pricing policy;
- investment to modernize equipment are alloy to ensure competitive capable production;
- use for printing companies of econometric models for forecasting obtain profits and its justification on the basis of distribution of profits.

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## MOBILITY OF A TEACHER IN THE CONTEXT OF PROFESSIONAL DEVELOPMENT

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### **Abstract.**

The article considers mobility as a necessary quality of a modern teacher. The professional qualities and basic qualities that are important in the formation of a mobile specialist are highlighted. Approaches to understanding mobility are described. The characteristic of concepts “mobility”, “mobility of the teacher” is given. Characteristic signs of teacher mobility are determined.

**Keywords:** mobility, teacher mobility, professional qualities.

**Introduction.** The interest of scientists in the problem of mobility in recent years has grown rapidly. Evidence is the work of philosophers, sociologists, economists, psychologists, educators, representatives of other sciences and this is due to increasing trends in the intensity of mobility processes and increasing their importance in society. Any aspect of modern social development, technology, and education brings scientists to the problem of the mobility of the modern teacher in the process of his professionalization [5, p. 22-30].

Analysis of scientific sources shows that scientists consider the problem of teacher mobility, but the range of such issues is quite diverse and applies mainly to higher educational institutions. L. Amirova, B. Bagishaiev, R. Prima, V. Osadchii, N. Bruzhukova, L. Goryunova, and M. Slyusarevskii considered such issues.

The aim is to substantiate the mobility of a modern teacher in the context of his professional development.



### **Presenting main material**

Education today must become mobile, continuous, which creates favorable conditions for the realization of the inner potential of the individual for self-development and work.

First of all, we pay attention to the concept of mobility, in a wide range of its manifestations, which is a complex phenomenon of modern culture. The social sciences recognize that mobility is the leading determinant of modern social dynamics, which determines the ontology of the modern life of people, information, things, capital, etc., and the scale of this phenomenon is becoming increasingly important.

The problem of the professional competence of a modern teacher of an educational institution is one of the most relevant in the pedagogy and philosophy of education. The quality of educational services, teaching, and education of pupils and students depend on the teacher, his personal characteristics.

Researcher M. Slyusarevskii believes that each person moves somewhere in life, demonstrating different types of mobility: when individual moves from one place to another we have territorial mobility, when changing profession and work - professional when changing family status - family mobility, change the same position the individual in society indicates his movement in the social space [7, p. 114].

Well-known modern English mobility theorist J. Urri offers four approaches to understanding mobility [8, p. 74].

*The first approach* is common and the term “mobile” is used to refer to what is moving or able to move, such as a classic mobile (portable) phone, as well as a mobile person.

In addition, the researcher writes, in English “mobility” is associated with “mob”, a disorganized mass of people, which due to mobility and disorder is not fixed within any limits and needs regulation and social control; The modern world is generating many new dangerous types of “mobs”, such as so-called “smart mob” with complex regulatory and control procedures [8, p. 74].

*The third approach* to understanding mobility, according to J. Urri, is to understand it as social mobility in traditional sociology, and *the fourth form of mobility* is identified by the author with long-term processes of geographical movement, migration [8, p. 74-75].

At the end of the XX century ideas of professional mobility naturally complement the discourse of mobility, embodying, on the one hand, the ability of individuals to quickly and

successfully master innovative technologies and approaches in their professional activities, on the other hand, characterizing the ability of individuals to fundamentally change their professional activities in accordance with rapid social dynamics and the labor market.

As an integrative entity, mobility involves the ability of an individual to quickly change their status or position in the social, cultural or professional environment in accordance with the conditions imposed on it by modern civilization, and which determine the style of thinking and action of people, social and ethnic groups, independently and freely think and evaluate events, creatively perceive the proposed information, the ability to think critically, find non-standard solutions in new situations, to anticipate the nature and course of change in a particular area and in social development in general [6].

Researchers L. Amirova and B. Bagishaev interpret mobility as “an existential orientation of the individual, represented in its structure in the form of a value-semantic construct that produces at certain moments in life types, types, levels of mobilization adequate to the requirements of the environment” [0, p. 551].

Scientist L. Goryunova uses the concept of mobility as an important professional characteristic of a modern teacher as follows: “The mobile educator must possess many qualities, among which the most significant are sensitivity to innovative changes in education, the ability to the internal mobilization of own resources to adapt to changing educational environment, increase own resources to solve new problems, necessary changes in the environment, mastering new pedagogical technologies” [2, p. 10].

In addition, L. Goryunova draws attention to the fact that professional mobility is a natural reaction to rapid changes in the labor market: “To be mobile - is, above all, to have the technique of constructing yourself in unpredictable situations” [2, p. 128]. The author notes that the concept of “mobility” is specified as the ability and willingness of the individual to quickly and successfully master new equipment and technology, to acquire the missing knowledge and skills that ensure the effectiveness of adaptation to new professional activities [2, p. 22-28].

At the beginning of the XX century in the literature, there is a tendency to create a national ideal teacher, according to which the ideal teacher was considered to be a spiritually perfect person, sociable, high moral, erudite, professional.

The Ukrainian teacher was tasked to know the history, language, culture, and traditions of the native people, to have a clear civic position, to work on awakening the national and political consciousness of students.

The value of the teaching profession is inalienable both in conditions of stability and in conditions of social change, although its content, essence, and specific characteristics certainly change. This creates a field of activity for scientists aimed at finding a new paradigm of higher pedagogical education, applying to its basis humanistic values, an important place among which belongs to mobility.

Today the teacher needs to have enough knowledge and information in the field of pedagogy, psychology, politics, history, philosophy, industry, management, which in combination convinces of the need to be mobile.

*What is a “modern mobile educator”? What are the requirements for a mobile educator?*

According to Yu. Kalynovskii, mobility is an integrative quality that is formed and developed during the practical, educational, social, socio-cultural activities of man and gives him the opportunity to realize their talents, abilities, inclinations, opportunities [4]. The researcher points out that this develops such personal qualities as the ability to observe their own actions and deeds, analyze and evaluate them, design, and change their lives [4].

Researcher L. Familyarska describes mobility as a personal ability to adapt to the dynamically changing conditions of the modern environment determines the ability not only to effectively adapt to them but also to realize themselves as a subject of active restructuring of living conditions and self-development [10, p. 79].

Analyzing the points of view of scientists, we understand mobility as the teacher has a thorough psychological and pedagogical knowledge, professional skills, ability to design their activities, manage the pedagogical process, creatively perceive and evaluate educational systems, models, technologies, and methods.

The more internally mobile the teacher, the better he is oriented in the situation, the faster he is realized in the social and professional hierarchy, the more diverse his pedagogical activity can be, says scientist L. Familyarska [10, p. 16-20].

According to the results of the analysis of scientific approaches L. Familyarska points out that the mobility of the teacher:

- Is determined by social and personal factors;

- As a result of purposeful self-development;
- Is a mechanism of personal flexibility and adaptation to changes in the professional environment;
- Is a condition for the continuity of personality development [10, p. 16-20].

Based on the comparison of a number of opinions of the authors with the characteristic features of the teacher's mobility, we determine:

- Personality traits and qualities (openness, flexibility, efficiency, adaptability, communicativeness, reflexivity);
- Skills (self-control, self-regulation, self-evaluation, goal setting, design, management);
- Abilities (constructiveness in joint interaction, thinking, designing the necessary changes in the development of the pedagogical situation, micro-society).

The problem of developing the mobility of a specialist, who must be competitive in today's labor market, concerns primarily the teacher, as he is seen as a specific source, mentor, leader, facilitator for the formation and development of the mobile personality of the modern student.

Based on the comparison of a number of authors' opinions with characteristic features of teacher mobility, we determine that a modern mobile teacher is an educated person who is able to flexibly restructure the direction and content of his professional activity, works independently, develops educational and cultural levels knowledge, skills and abilities, critical thinking, able to act creatively.

The teacher's approach to the ideal, this personal self-improvement of the teacher is described by V. Khiminets [10, p. 79].

The scientist determines that the teacher must:

- Have approaches and methods of research work;
- Know and be able to apply pedagogical theory in practice;
- Know the basics of psychology, age and individual psychological characteristics of students;
- Have the methodology and technology of the educational process;
- Have managerial skills;
- Know the physical and mental limits of the child's body;
- Have the correct diction, artistic word [9, p. 79].

In addition, V. Khiminets substantiates the qualities required for a professional and mobile teacher, namely:

*Professional qualities:*

- The ability to realize themselves in the dynamics of social life, to feel a socially competent person;
- Focus on mastering multifunctional skills in conditions of instability in the state;
- Readiness for flexible reorientation in real professions;
- Knowledge of English (or other foreign languages) at the level of professional and situational communication;
- Possession of information culture [9, p. 79].

*Personal qualities:* communicative culture; optimism, faith in one's own strength; social mobility [9, p. 79].

Thus, a modern mobile educator needs flexibility and non-standard thinking, the ability to adapt to rapid changes in living conditions, and this is strategic thinking, which is possible only with a high level of professional competence, the presence of developed professional abilities.

**Conclusion.** Thus, we can say that the presence in society of a sufficiently large number of active, mobile teachers helps to improve the quality of educational activities in educational institutions.

Thus, modern education requires highly qualified, highly experienced, competent professionals - teachers who have deep pedagogical knowledge, national and world culture, able to work in new conditions, constantly looking for the most effective ways, means of teaching and education.

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## **PROFESSIONAL GROWTH OF A TEACHER IN THE FORMAT OF SCHOOL METHODICAL SERVICE**

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### **Abstract.**

The article considers the problem of the professional growth of a teacher, as well as the possible impact on this problem of the school methodological service. It is investigated which scientists dealt with this problem and the definition of the concept of “professional growth” specified within the limits of research has resulted. The problem of professional development in other countries and in Ukraine is considered, the assumption about the expediency of use of school methodical service as a basis for the professional development of teachers in Ukraine is made.

**Keywords:** professional growth of a teacher; professional development; self-education; school methodical service; the concept of the New Ukrainian School.

### **Introduction.**

The current stage of development of the education system of Ukraine is characterized by the search for ways to bring the content in line with the personal needs of students, world standards. The education sector has always responded to social change, gaining signs of modernization and reform, focusing on long-term innovation. The emergence of various educational trends is accompanied by the introduction of new approaches in teacher training, the system of postgraduate education sets the task of correcting the activities of methodical offices in the direction of disclosure and development of the creative potential of teachers. The implementation of the ideas of modern reforms requires a change of goals and approaches to the educational process, an understanding of how the new educational strategy should be implemented. Today

directs educators, scientists, experts, and all those who are not indifferent to educational issues to find strategies for implementing educational change.

The New Ukrainian School is changing the whole system of education and the teacher himself. These changes cause a new semantic and technological burden on the professional development of educators. The teacher must be ready for continuous professional development, continuous improvement, possession of certain competencies that determine his ability and willingness to innovate and manage it.

The teaching profession requires a special attitude to the constantly updated trends of social life, the ability to adequately perceive the needs of society, and the appropriate adjustment of their work. This ability is especially important in the information environment, which requires many fundamentally different from previous skills, abilities, and appropriate thinking [5, p.32].

### **Presenting the main material**

Determining the relevance of this problem, we note that it is insufficiently covered in the scientific and pedagogical literature; there is a lack of fundamental and applied research on the functioning of institutions of methodological service as scientific and methodological institutions. Problems of methodical work with pedagogical staff are considered in the works of T. Besida, M. Krasovitsky, G. Shtompel, and others; aspects of the organization of scientific and methodical work are covered by Yu. Babansky, N. Vashchenko, G. Danilova. In the context of solving the problems of methodical offices as a component of the educational field, the works of O. Bondar, B. Gadzetsky, I. Zhernosek, G. Litvinenko, V. Putsov, K. Starchenko are important.

Problems of professional growth of teachers were studied by both domestic and foreign scientists: historical-methodological and theoretical aspects of pedagogical professionalism (N. Guzii); pedagogical stimulation of professional growth of teachers (L. Litviniuk); professional self-improvement of primary school teachers in the system of postgraduate education (L. Sushchenko); management of the process of professional growth of a teacher (Yu. Zavalevskyi); professional growth of a teacher in the system of scientific and methodical activity (O. Valchuk); professional growth of teachers in the conditions of postgraduate pedagogical education (E. Untilova); main factors of professional development success (T. Gasky).



Methodical services are mentioned in the context of questions of formation of scientific and methodical maintenance, criteria of efficiency of functioning (G. Litvinenko); experience of innovative management of methodical process (L. Glushchenko); innovation process management systems (L. Vashchenko); criteria for evaluating the activities of the methodological service (M. Glazunok); education quality management (S. Odaynyk).

In studies of the problems of the professional development of teachers, the essence of the concept is defined by both foreign and domestic scientists. It should also be noted that various terms are used in scientific works to denote the professional development of a teacher, in particular, “teacher development”, “career development”, “staff development”, “development human resources development” or “human resource development”, “professional development”, “continuing education”, “lifelong learning”, “professional development” and others [8].

The concept of “professional development” is interpreted differently by different scholars:

- J. Scheerens believes that it is “a system of different activities to prepare teachers for professional activities, including initial training, induction programs, postgraduate training, continuing professional development in activities in the educational institution. Such activities develop personal skills, knowledge, skills, and other characteristics of the teacher. That is, the professional development of teachers is a continuous process that includes the following components: initial training, introduction to the profession and continuous improvement of personal, social and professional competencies of the teacher” [12];
- I. Khorzhevskaya notes that this “professional development of personality is connected with the development of personality in general, with the acquisition of new experience, knowledge, skills and with the transformation of motivation and interests of a particular person” [10];
- L. Korneeva notes in her works that “professional development means growth, formation, positivity, integration of personal qualities and abilities, professional knowledge and skills in professional work, but the main thing is an active qualitative transformation of one’s inner world, which leads to a fundamentally new its construction and way of life - creative self-realization in the profession. The main psychological prerequisite and form of implementation of the professional development of the individual is his professional socialization” [2].

There are still many definitions of “professional development”, but we will use the definition of the American scientist A. Glatthorn, who argued that: “professional development is the

development of the teacher's personality in a professional context through experience and systematic analysis of their own pedagogical activities" [11].

Professional self-education is aimed at the realization of the teacher himself as a person. The desire for self-improvement, self-education are important factors in the professional growth of teachers, ensuring the expansion of his creative potential, cognitive interests, and the formation of a creative personality. Professional development involves the acquisition of formal and informal experience. Formal - participation in seminars, professional meetings, mentoring. Informal - reading, publishing, watching thematic documentaries. The analysis of this takes into account the content of professional development, its operational component, and the context in which it is implemented. This concept defines the professional development of a teacher as the growth that occurs in the process of moving a teacher according to the career development cycle. Participation in methodical decades, workshops, masterclasses, training, author's seminars, pedagogical readings, exhibitions promotes the professional growth of each teacher.

According to the scheme presented in the book by G. Meshko "Introduction to the pedagogical profession", for professional and pedagogical self-improvement the teacher must improve professionally significant features and qualities, engage in self-education and scientific and methodological work, study and summarize the advanced pedagogical experience [4, p.26].

It is undeniable that the constant updating and development of knowledge makes it impossible to provide teachers with knowledge and skills that will be sufficient for his professional activity for a long time. That is why vocational education and teacher training must be continuous and in line with new education strategies and goals.

Professional development is usually provided in various institutional institutions. The organization of postgraduate teacher education can be carried out on the basis of adult education institutions (Hungary, Czech Republic); professional associations of teachers (Spain, Italy); Professional Development Schools (USA); professional associations of teachers, independent advisory groups (UK); universities, pedagogical institutes (France, Germany, Spain) offer professional development courses or modules for practicing teachers to acquire content and subject and pedagogical skills), training centers, professional associations of teachers (UK, Ireland, Poland, Hungary, Italy, Spain); regional teacher training centers, training centers (Austria, Spain, Ireland, Great Britain, Hungary, Germany, Finland); secondary schools (Germany, Finland), private companies; teacher training centers. Most EU countries note that

participation in professional development is generally considered to be useful in terms of career progression, so they link professional development to school development priorities and coordinate postgraduate education at school accordingly. In 3/4 of the countries, professional development activities are planned in the context of school development, although not exclusively in this way [9, p.118].

Improving the quality of teacher education is a priority in the development of professional development strategies. Monitoring the quality and external evaluation of teacher activities (using diversified assessment methods and sources of information about student academic achievement, monitoring classroom work) is the most effective for determining the quality of education (Italy, Greece, Spain). In the studied countries, the main efforts to improve the quality of teaching are aimed at:

- Defining clear goals for teachers;
- Encouraging the best to teach;
- Training through training and gaining useful experience;
- Compliance of the teacher's skills with the needs of the student;
- Teacher's personality;
- Monitoring the learning and teaching process;
- Teacher support and correction of instructions;
- The motivation of teachers to work [9, p.246].

The Law of Ukraine "On Complete General Secondary Education" states that "in order to ensure the professional development of teachers, the implementation of their scientific and methodological support in the system of general secondary education, there are centers for the professional development of teachers. Regulations of the center of professional development of pedagogical workers are approved by the Cabinet of Ministers of Ukraine" [1].

According to the Regulations on the district (city) methodical office (center), approved by the order of the Ministry of Education, the district (city) methodical office (center) is "a scientific and methodical institution which, in accordance with current legislation, provides scientific and methodological support to the general secondary and preschool education of the district, districts... city (without district division) and advanced training of pedagogical workers" [6].

In the Regulations on the district (city) methodical cabinet, it is at the level of methodical cabinets that the content of scientific and methodical work for individual educational institutions

and pedagogical workers is specified. Through the methodological service, which is an integral part of the system of continuing education, the state policy of scientific and methodological support of the education and training system is implemented; the implementation of projects, ideas, recommendations, and technologies takes place. In addition, methodical offices are the closest source of the latest pedagogical thought to the teacher, the center most familiar with the problems of methodical service and the real state of education in the region [6].

That is why methodical offices play an important and extremely important role in the formation of a teacher's professional growth.

According to G. Litvinenko, an important role in the system of continuing education belongs to the district (city) methodical offices, which in modern conditions as scientific and methodological institutions provide scientific and methodological support for general secondary and preschool education and training of teachers [3, p. 77].

The main tasks of the center are "implementation of methodological and informational support of educational and production and educational processes in vocational schools; analysis of the quality of education, the level of knowledge, skills, and abilities of students, students of vocational schools for vocational, general education, development of proposals and methodological assistance to teaching staff of educational institutions to improve training and production and educational processes; implementation of measures to study, generalize and implement innovative pedagogical and production experience and the latest pedagogical technologies in the educational process in general secondary education institutions and provide assistance to educational institutions in organizing work of pedagogical councils, methodical commissions, educational and methodical institutions education" [6].

The methodical work of teachers is a holistic system of interconnected actions that ensure the continuous development of the creative personality of the teacher, the formation of a single team of teachers-researchers, and ultimately - increase the creative educational level of the educational institution. Methodical work should become a vital need of each individual teacher and, at the same time, a mandatory requirement, the most important condition for ensuring the effective functioning and development of the school. But, very importantly, methodical work should be organized on a scientific basis, because only then it will be possible to ensure the maintenance of proper professional form of each of its members and the team as a whole, to ensure an adequate response to all innovative processes in education, and in society as a whole.

The most productive forms of work of teachers, which, according to V. Poltoratska, contribute to the development of motivation, the interest of teachers in improving their pedagogical skills are:

- Methodical development of non-standard lessons;
- Making sets of didactic material;
- Author's programs of special courses and electives;
- Development of research works of members of the school methodological association;
- Publications experience of teachers [7].

The greatest and the most important part of the scientific and methodological work with pedagogical staff are video conferencing, webinars, Skype communication. A necessary condition for the formation of single information and the educational environment in the region is the creation of Web-sites of educational institutions, blogs, and sites of teachers.

### **Conclusion**

Thus, scientific and methodological work, covering the range of these problems, is an important driving force in the development of the secondary school in Ukraine. The problem of quality and efficiency of scientific and methodical work in secondary schools has become a cornerstone of the reform of educational systems. The National Doctrine of Education Development also clearly defines the task of a modern school: creating conditions for the development of personality and creative self-realization of every citizen of Ukraine, educating a generation of people who are able to work effectively and learn throughout life.

The basis of the professional development of a teacher is the awareness of all transformations in education as a natural need to constantly improve their skills, to form, and develop a professional worldview and pedagogical consciousness.

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## **ECONOMIC MECHANISM OF ADAPTATION OF INDUSTRIAL ENTERPRISES IN THE CONDITIONS OF AN UNSTABLE MARKET**

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### **Abstract.**

In the article the questions of enterprise existence are considered in the conditions of unstable environment. The questions of industrial enterprise adaptation forming are analyzed to the terms of internal and external changes. The mechanism of industrial enterprise adaptation forming is worked out. Each of the stages is considered in detail. A mechanism in detail is considered and offered chart of his forming. The levels of the use of adaptation potential are done. There are: high, sufficient, insignificant. Their short and quality descriptions of the use of industrial enterprise adaptation potential are done. Concept-model of industrial enterprise productive economic system development in the conditions of adaptation potential forming is offered. Graphic interpretation of industrial enterprise productive economic system development offers in the article. Methodical developments offer in this research are important for further scientific developments as a base. On that further calculations and practical developments can be built on a management by potential of enterprise adaptation.

**Key words:** mechanism, adaptation, enterprise, management, optimality, effectiveness, competitiveness, competitive immunity.

### **INTRODUCTION**

There are enterprises the organizationally-economic mechanism of that within the framework of financial and technological crisis and under influence of consequences of pandemic of



COVID-19 is characterized by the wide range of dynamic quality and whose economic phenomena and processes often are not written into the scopes of the generally accepted theories (as, for example, conception industry 4.0). Therefore, for the decision of arising up in these terms tasks from the leaders of such enterprises development of new non-standard decisions and methodological approaches is required. Successful operating and development of modern industrial enterprises conditions are in a great deal determined by concrete possibilities (by competition status, key factors of success, competitive edges, competition immunity and financial stability) to their adaptation to what be going on changes in an environment, and effective management by an enterprise maybe only during purposeful and timely adaptation of enterprise to the changing (sometimes radically) market conditions. Inoptimality of the use of present resources, imperfection over of methods and procedures of management and increase of enterprises' competitiveness of all of it brings to appearance of lost opportunities and as a result to the considerable losses. They touch both positioning at the market and imaginary losses.

## **1. METHODOLOGY OF RESEARCH**

In modern interpretation organizationally-economic mechanism of management by an industrial enterprise it is totality of principles, methods, design under influence of digital transformation of economy and business, and also connective processes of providing stability of functioning and purposeful development of enterprise in a changeable and dynamic environment. Stability, development and level of competitiveness, here are the base elements of realization by the enterprise of the combined economic potential. Thus, coming from the modern terms of market relations on the first plan such component of general mechanism of management comes forward by an enterprise as a management by his potential. This management within the framework of adaptive possibilities of industrial enterprises of country function, both, on global markets and internal market. Technological lag in a number of industries of some countries economy, obviously insufficient account most industrial enterprises of terms and influence of environment, low level of capital investments in modernization and reengineering productions, loss of skilled shots from the industrial complex of national and regional economy are objective reasons of low competitiveness of both products and domestic enterprises.

All of it forces intently to investigate the problem of mobilization of all internal backlogs of enterprise, and also practical realization of methods and on the whole mechanism of adaptation of industrial enterprises in the conditions of present environment with the purpose of the most complete use of economic and competition potential of enterprise.

Changes that take place on an enterprise take character external or internal. Thus internal changes the enterprises often related to adaptation to the changes in an environment, because an enterprise opens (all its elements co-operate inter se and test the actions of external factors, carrying out influence on each other and on the whole system ) system. For the exposure of the most effective adaptation events first find out bottlenecks in the system and determine directions of change. For the most complete scope of problems of adaptation it is expedient to examine a few variants of changes simultaneously. Comparing separate variants inter se it is necessary to take into account next criteria: to the strategic orientation (any adaptation events must submit to the strategic tasks that stand before an enterprise); fast-acting's (a result must appear quickly); exactnesses of influence (adaptation events must influence exactly on those elements on that it is envisaged by the plan of adaptation); to the predictability of results (operating under adaptation must not carry unforeseeable character and must be in detail prepared); to firmness of adaptation effect (an effect from realizable events must be kept long time); realistic of possibilities (composition and character of resources necessary for realization of adaptation measures must answer possibilities of enterprise); to economic efficiency (a result from adaptation events must exceed an expense.

The analysis and construction of mechanisms for effective functioning at the enterprise were addressed by [1–7]. During work with scientific sources such concepts were educed: adaptivity (Kapitanets Yu.O., Krivobok K.V., Pastukhova O., Drobysheva V.G.), adaptive process (Nizhnik V.M.), adaptive system, adaptive reaction (Chernyak G.M., Gerasimova of O.L., Podolyanu M.V., Chachkova A.V.), adaptive model (Kulik N.M., Sokolenko T.M.), adaptive approach (Kulik N.M., Sokolenko T.M.), period of adaptation (Miller A.O.), adaptation syndrome (Budnik M.M., Miller A.O.), adaptation mechanism, adaptation measure (Nizhnik V.M., Kulik N.M., Sokolenko T.M.), methods of adaptation, zone of adaptivity of potential, adaptive signs, direction of adaptation (Grosul V.A., Kruglova O.A., Rachkovan O.D.), adaptive control, effect of adaptation (Miller A.), managements by adaptation, adaptation possibilities (Miller A.), adaptation resource (Starikova M., Rastopchina YU., Bezugliy Ye.), adaptation

potential, readaptation (Berkaeva A.). But there is a necessity of realization of adaptation mechanism determination processes on an enterprise. The organizational mechanism of adaptation must embrace all spheres of activity of enterprise in their intercommunication and envisage the searchability of bottlenecks of production and management on the base of the use of elements of theory of limitations that it is expedient to use as key points of structural alteration.

## 2. RESULTS AND DISCUSSION

A management mechanism of enterprise adaptation potential includes the row of the associate stages. We will consider them more detailed.

**Goal setting.** On this stage the due level of providing of competitive edges, key factors of success are determined, immunity as condition of long-term (steady) development of industrial enterprise.

**Determination of problem.** On this stage enterprise management determine that exactly is key: 1) Insufficient rates of development; 2) Presence of bottlenecks; 3) Loss of level of competitiveness; 4) Decline of potential of adaptation to the market conditions. After finding out of direction on that changes will pass in-process enterprise, he is examined more in detail.

**Specification of tasks.** There are possible two variants: maximization of the usage of adaptation potential and increase of potential. The first variant is used, when an enterprise has the potential, but uses it not to a full degree. The second variant is used, when an enterprise does not possess the sufficient level of development of the potential.

On the next stage there is working out in detail of further actions. They can be expressed by an algorithm:

- 1) Complex diagnostics of industrial enterprise.
- 2) Estimation of levels: potential of adaptation, competitiveness, competitive edges, key factors of success, competition immunity.
- 3) Development of administrative influences on maximization of level of the use of potential.
- 4) Development of principles, criteria, measures (strategies) on the increase of potential.

On this stage a basic criterion is efficiency of correlation «potential – the use – potential».

After making of concrete measures and moving-off the important stage of verification of accordance of actual results to the plan indexes comes on drawn up plans.

Control after realization provides for:

- 1) Analysis of effectiveness of control system in relation to the decision of tasks;
- 2) Estimation of efficiency of control (mechanism) system by the productive system.

On the current stage competitiveness comes forward a criterion.

Pay attention that the analysis of effectiveness of control system in relation to the decision of tasks must correspond with maximization the uses of potential of adaptation on third from the enumerated stages. And estimation of efficiency of control system accordance supposes the productive system to the criterion of competitiveness providing all brought stages over.

Offered system of management mechanism fully laid potential of enterprise adaptation in the classic chart of management and will realize the key functions of management: planning, prognostication, organization, co-ordination, account, control and motivation. Planning and prognostication comes true on two first stages: determination of aim and finding out of problem. Organization, co-ordination and motivation is especially important during the specification of tasks and finding out of algorithm of their decision. An account and control come true on all stages, but especially important at control after realization of the set measures on the last of peat-time.

It is important to remember that an enterprise is the open system and is in close intercommunication with the environment of functioning. In addition, an enterprise is dynamic system. Therefore, during realization of measures on a management it is necessary constantly to take into account influence of factors of not only external but also internal environment potential of adaptation. For the correct forming of industrial enterprise adaptation potential understanding is needed that, how he is formed. Scheme possible variants and direction of his development are shown on a figure 2.

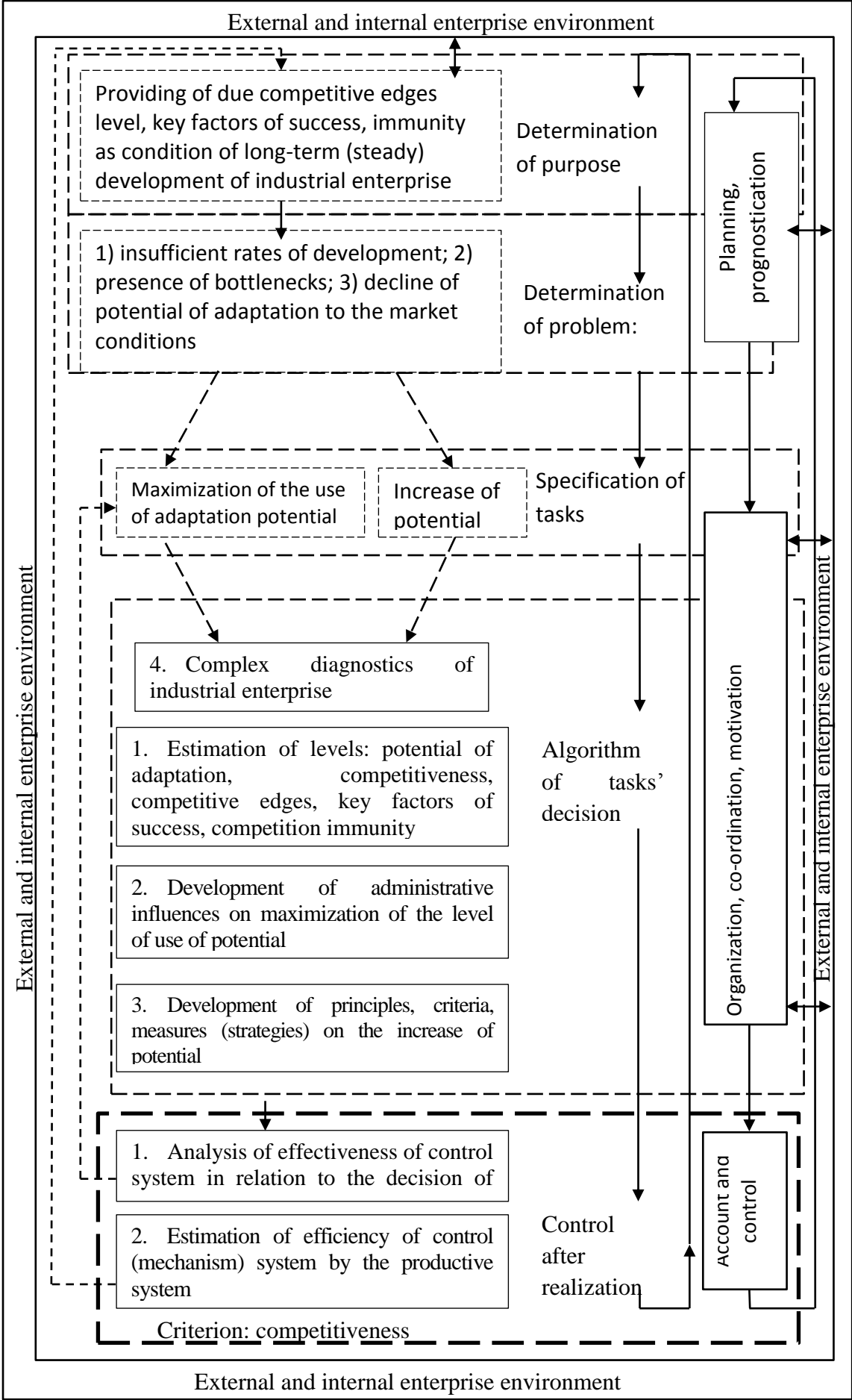
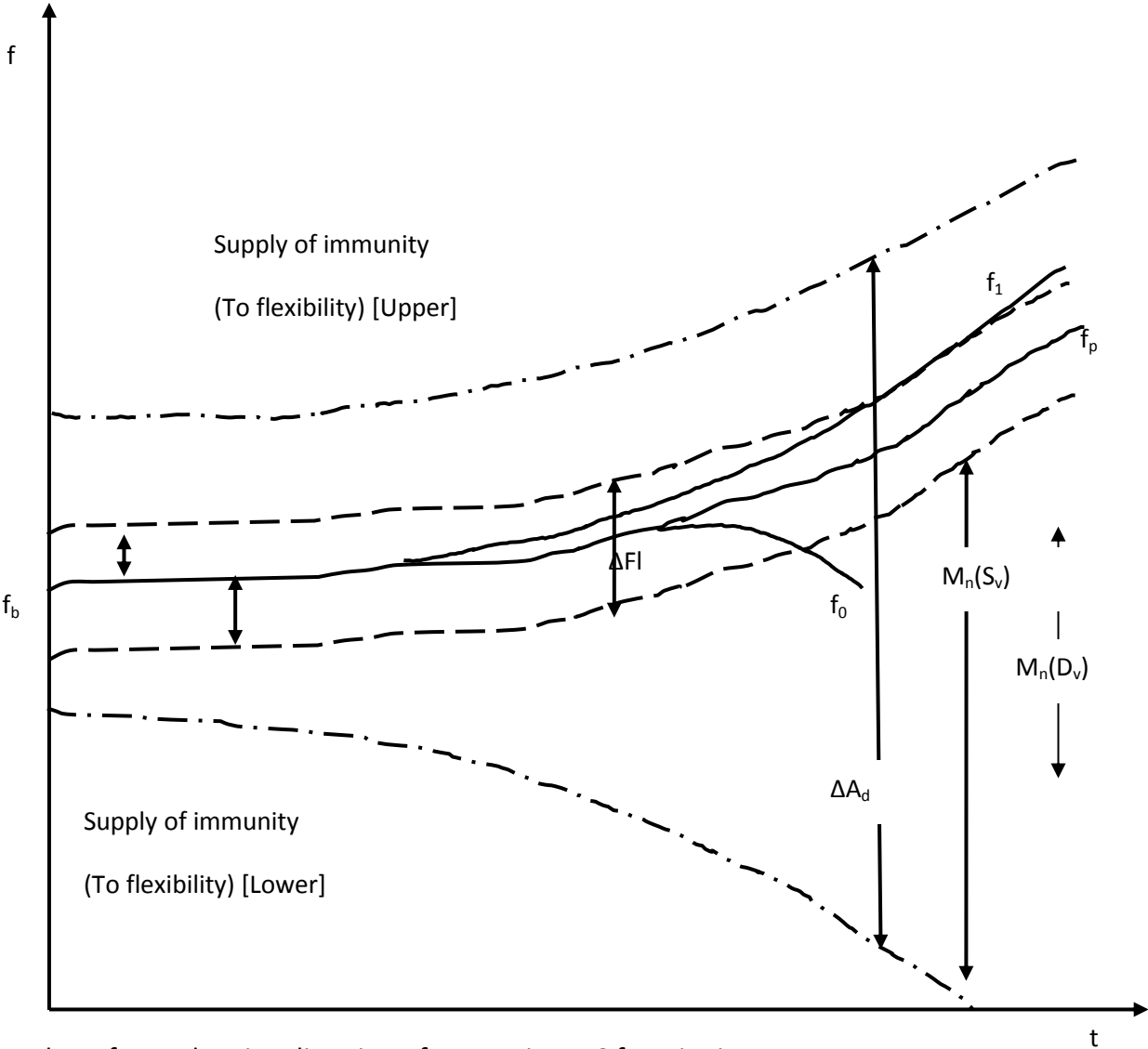


Fig. 1: Conceptual model of management mechanism by potential of enterprise adaptation (it is worked out by authors)



Where  $f_p$  – a planning direction of enterprise PES functioning;

$f_0$  – a pessimistic variant;

$f_1$  – an optimistic variant;

$\Delta F_I$  – a range of competition immunity (to flexibility) of enterprise PES;

$\Delta A_d$  – a range of possible adaptation (depth of adaptation);

$M_n(S_v)$  – a zone of «maneuverability of survival» of enterprise PES;

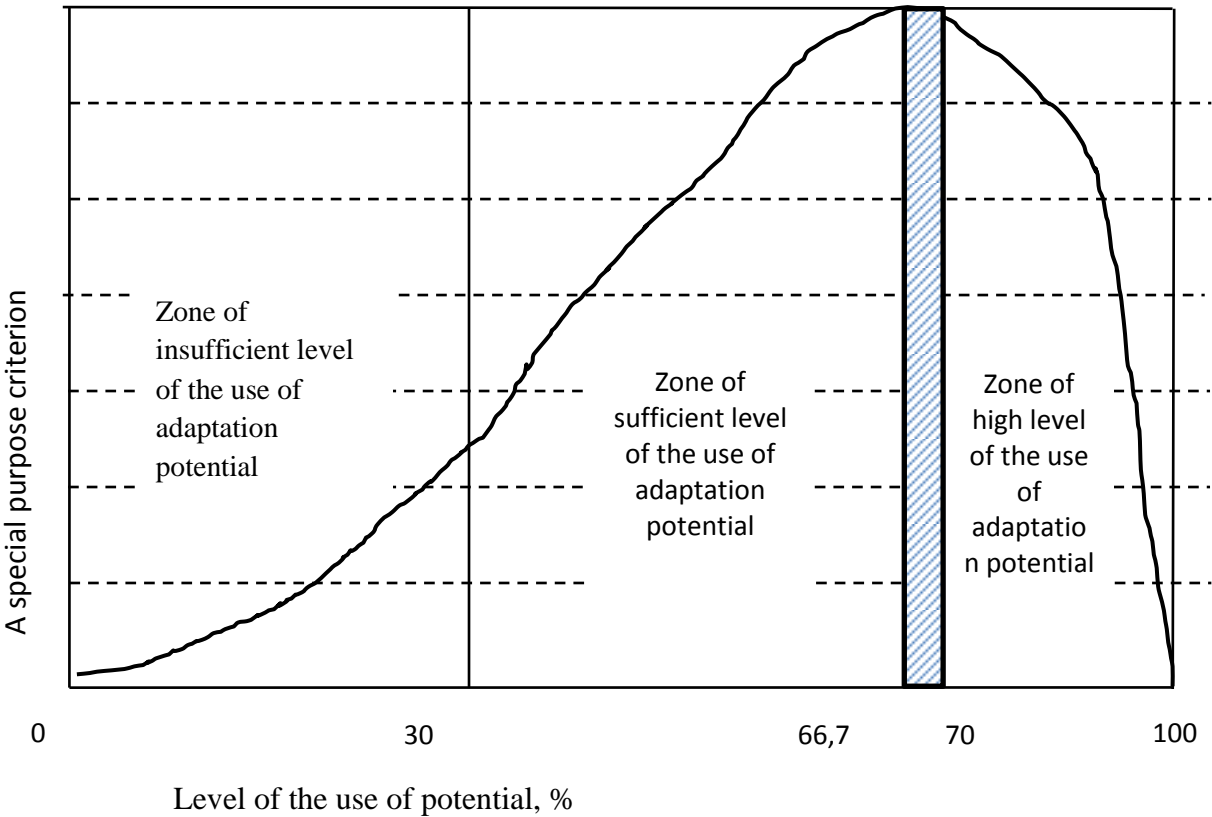
$M_n(D_v)$  – a zone of «maneuverability of development» of enterprise PES;

$t$  – a period of time of functioning of PES of enterprise

A plane trajectory lines up in the process of making of general strategy of development of the industrial enterprise productive economic system (PES). It is a having a special purpose way of development. But for the valuable planning it is necessary to envisage two variants of development of events: optimistic and pessimistic. The first will come at friendly to the enterprise changes in an environment, at the positive dynamics of development of enterprise, and also at a favorable coincidence for the investigated enterprise. Offensive of second maybe at the

insufficient account of all factors of influence on enterprises and at worsening of environment terms. It is necessary to understand that in practice a management puts before an enterprise a not concrete number, and range of values of plane indexes. It provides the presence of some «supply of immunity». Such supply carries the name «flexibility». We consider that it is expedient to distinguish overhead and lower supplies of immunity (fig. 2). Distance between these two lines is range of competition immunity. More wide range is a range of possible adaptation. In other words, is the depth of adaptation. It is the space for a survival or development of enterprise. Character and direction of the changes are determined by not only the attained level of enterprise potential development but also favorable possibilities of environment and ability of guidance of them in time to take into account.

Depending on the degree of achievement of having a special purpose criterion and level of the use of «potential of adaptation» it is possible to distinguish three zones of the use of enterprise adaptation potential (fig. 3). As a result, we have selective distribution of having a special purpose criterion, characterizing efficiency of the system «Potential of adaptation–use of the combined economic potential». Taking into account the comments stated in [5,6], it was developed.



**Fig. 3 Selective distribution of having a special purpose criterion, characterizing efficiency of the system «Potential of adaptation–use of the combined economic potential» (it is worked out by authors)**

As a having a special purpose criterion the integral index of estimation of the combined economic potential of enterprise, certain, can be used, for example, by an analytical or expert way.

Author`s look to maintenance of the use of adaptation levels of economic potential is in the table. 1.

**Table 1 The use levels of industrial enterprise adaptation economic potential**

**(It is worked out by authors)**

The use level of adaptation potential	Short description	Quality descriptions of the use of industrial enterprise adaptation potential
High (70%–100%)	An enterprise is in a state of absolute equilibrium on all functional constituents in accordance with the chosen criteria of estimation (including context of ideal competition immunity)	<div><div>– A market share is stable;</div><div>– Producing products are for sale in full (export no less than 50% from the volume of output);</div><div>– A physical production volume is stable;</div><div>– Position at the market is steady;</div><div>– Technique and equipment, technology used in a production modern and wear no more than 10-20%. Level of automation / robotization no less than 25-40%;</div><div>– Financial position of enterprise is steady;</div><div>– A return not below than middle on industry of level on the inlaid capital</div></div>



Sufficient (30%–70%)	Activity of enterprise is effective enough. There are difficulties (risks, threats) that is overcome by work of mechanisms of adaptation and increase of competitiveness level of products and productive services	<ul style="list-style-type: none"><li>– Producing products are for sale. A market share is unstable, but on the average for period of supervision supported at certain level;</li><li>– Technical and technological solvency - satisfactory. Wear of basic equipment from 20-60%;</li><li>– Financial indexes have middle on industry of level values as a rule</li></ul>
Insignificant (0%–30%)	Presence of chronic violations of major parameters of all functional constituents as on the whole economic potential so potential of adaptation	<ul style="list-style-type: none"><li>– Problems with providing of enterprise resources, their ineffective use;</li><li>– Presence of losses on the markets of producible products. (A decline of stake / is a loss of market);</li><li>– Considerable loss of market subpotential (unfavorable changes in composition competitors, assortment of products of and other);</li><li>– Presence of problems with the technical and technological providing of productive activity</li></ul>

Substantive provisions reflecting the rich in content filling with of each of offer the authors of possible levels of the use of enterprise adaptation potential are shortly exposed in a table. In addition, quality description of the use of industrial enterprise adaptation potential is given.

CONCLUSIONS

Based on the study results, the following conclusions are evidently drawn. Solution of important scientific and practical problem offers in the article. An authorial look offers to the mechanism of industrial enterprises` adaptation potential forming. A chart suitable for practical

application in the conditions of work of industrial enterprise is worked out. It gives an opportunity to work out the list of associate steps. Following the way set in these steps, an enterprise has the opportunity to form the adaptation potential and operatively to correct it taking into account nascent tasks. In addition, the conceptual model of development of the industrial and economic system of industrial enterprise is worked out. It is clearly shown on it, that must be taken into account to guidance of enterprise at preparation of plans of development of the industrial and economic system. The optimistic and pessimistic variants of development of events are shown. It is shown, as a supply of flexibility of enterprise is formed. On a figure the ranges of competitive edges, depth of adaptation and zone of maneuverability of development productive economic system are shown. This chart has a practical value and can increase making of certain digital values for every certain enterprise.

Undertaken a study gives to the enterprises that function in unstable market conditions, clear and effective method. The method will allow for every enterprise independently to produce the methods of behavior in an unstable environment and strengthen the market positions.

In our research we did not draw on development of other scientists. All results are got authors independently.

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## **THE TEMPORAL CONCEPT OF STATE COUNTERCYCLICAL REGULATION OF THE ECONOMY (ON THE EXAMPLE OF THE AGRI-FOOD SECTOR)**

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### **Abstract.**

Approaches to state regulation of agri-food sector development were studied. The urgency and expediency of using the macroeconomic approach to regulating the development of the agri-food sector was proved. A macroeconomic approach to economic regulation was developed by introducing the concept of temporality into the categorical apparatus of countercyclical economic regulation. The essence of the temporal concept of countercyclical regulation of the economy (agri-food sector) was revealed. The purpose and tasks of countercyclical regulation of agri-food sector development were defined. A system of principles of the temporal concept of countercyclical regulation of the agri-food sector development was developed. An algorithm for the implementation of countercyclical regulation of the economy (agri-food sector) was developed. The main stages of countercyclical regulation of the economy on the basis of temporality were revealed.

**Key words:** anticyclic regulation, cycle synchronization, temporality, coherent resonance, agri-food sector

### **Introduction**

The state's influence on the development of the agri-food sector is exercised through direct budget support for the development of some industries (including agriculture) and indirect state regulation of other industries using fiscal, monetary and other policy instruments. At the same time, some industries are completely subsidized, and preferential conditions are created for others, while other industries must independently solve all their problems. To a certain extent,

such selectivity in the use of government tools for the development of the agri-food sector is reflected in the consumers of the final product, who must withstand the entire burden of these actions through fluctuations in food prices. The ramifications and unsystematic application of state regulatory instruments do not contribute to achieving the overall goal of the agri-food sector development – ensuring the country's food security. In addition, such an approach in regulating the development of the agri-food sector is inefficient and costly for the economy as a whole.

Among the shortcomings of the policy of state regulation of the development of the agri-food sector, a significant place belongs precisely to the untimeliness, short duration and incompleteness of measures and programs. All this is due to the underestimation of the modern perception of time as a special economic resource, and how this resource affects each element (sector, industry) of the overall system. The nature of the influence of time on the economy, politics, society and the like is being transformed. Time itself changes qualitatively, it becomes multiple, denser, probabilistic, tense, mobile, fluid, instantaneous, multi-structured, multi-vector. Such features are reflected in the fact that "reality is presented not so much linearly and expressively as nonlinearly and synergistically"<sup>1</sup>.

The conceptual provision in the development of new approaches to regulating the development of the agri-food sector should be taking into account the different tempo rhythms of the course of economic, social and other processes.

**Recent research and problem definition.** Scientific views on regulating the development of the agri-food sector are considered in two directions: the first approach is advocated by agricultural scientists, who are inclined to think about a special approach to state regulation of the agri-food sector<sup>2 3 4 5 6</sup>; the second approach – macroeconomic, focuses on the feasibility of

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<sup>1</sup> Dzoban O. (2018) The temporal component in the space-time continuum of virtual reality. *Strategic priorities*, 2(47), 118-126.

<sup>2</sup> Mishchenko D. (2014) *Mekhanizmy derzhavnoho rehulyuvannya rozvytku ahrarnoho sektoru ekonomiky Ukrayiny: teoriya ta metodolohiya*. [Mechanisms of state regulation of the agrarian sector development of Ukraine's economy: theory and methodology.] Dnepropetrovsk, Ukraine: DSFA [in Ukrainian]

<sup>3</sup> Mohylnyi O. (2002) *Derzhavne rehulyuvannya ahrarnoho vyrobnytstva v period transformatsiyi ekonomiky*. [State regulation of agrarian production in the period of the transformation of the economy.] Kyiv, Ukraine: IAE UAAN 430 [in Ukrainian]

<sup>4</sup> Oliynyk T. I. (2009) Derzhavna pidtrymka ahrarnoho sektoru ekonomiky Ukrayiny. [State support of the agricultural sector of Ukraine's economy.] *Economy AIC*, 7, 80-86. [in Ukrainian]

<sup>5</sup> Pashaver B., Shubravskaya O., Moldavan L. (2009) *Vyklyky ta shlyakhy ahroprodovol'choho rozvytku*. [Challenges and ways of agro-food development.] Kyiv, Ukraine: NAS of Ukraine. [in Ukrainian]

<sup>6</sup> Prysiashniuk M., Zubets M., Sabluk P. (2011) *Ahrarnyy sektor ekonomiky Ukrayiny (stan ta perspektyvy rozvytku)*. [Agrarian sector of the economy of Ukraine (state and prospects of development).] Kyiv, Ukraine. [in Ukrainian]

applying state regulatory measures, the same for all areas of the national economy, taking into account the cyclical nature of economic development.

Agrarian scientists substantiate the need to take into account the special conditions of application of measures of state regulation of the agri-food sector by the presence of the following problems: low efficiency of agricultural production, imperfection of investment support mechanisms; the problem of deformation of price proportions (price disparity); irrational use and lack of an agricultural land market; the problem of security of fixed assets; imperfection of infrastructure and mechanisms of regulation of agro-food market conditions; deformation of the structure of production and exacerbation of social problems in rural areas.

Proponents of the macroeconomic concept of state regulation of the development of the agri-food sector of the economy believe that the low effectiveness of state measures to support the development of the agri-food sector, which has a special status in these issues, indicates the need for other methodological approaches. Scholars<sup>7</sup> believe that the need for state regulation of agricultural production is justified and should be carried out depending on the stages of its development and the level of stability of the main parameters of the economic system. They prove the fact that among the reasons that led to a critical situation in the agricultural sector, the most important is the low efficiency of state regulation due to lack of development strategy, lack of consistent government policy to support agricultural development, unsystematic and uncomplicated solutions to agricultural reforms, lack of a balanced state policy of rural development and mechanisms for its implementation.

Solving the problems of agri-food sector development is possible with the introduction of a fundamentally new, scientifically sound concept of state regulation, which should focus on solving both current and long-term goals, take into account the response to cyclical fluctuations of the economic system as a whole and fluctuations of its subsystems and take into account the constraints of the external economic environment. This concept is the development of the second direction of scientific thought to regulate the development of the agri-food sector.

**The aim of the research is** to develop conceptual frameworks for state countercyclical regulation of the agri-food sector, which is considered as a system of interconnected industries, the simultaneous development of which in certain periods has both positive and negative

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<sup>7</sup> Latynin M. (2006) *Ahrarnyy sektor ukrayins'koyi ekonomiky ta mekhanizm derzhavnoho rehulyuvannya*. [The agricultural sector of the Ukrainian economy and the mechanism of state regulation.] Kyiv, Ukraine. [in Ukrainian]

consequences: leads to accelerated growth of the general state of the sector during periods of crisis and depression. Counter-cyclical government measures should be aimed at dampening the intensified development in the phase of economic recovery and reduction in time and mitigation of the consequences in the phase of crisis.

**Research result.** The new concept of state regulation of the agri-food sector should be based on the principles of temporality and become the basis of a coherent-resonant paradigm of economic development.

Temporality – is the temporal essence of phenomena generated by the dynamics of their special motion, in contrast to those temporal characteristics that are determined by the ratio of motion of this phenomenon to historical, astronomical, biological, physical, and other temporal coordinates. Temporality is a specific relationship of moments of time and time characteristics; temporal essence of phenomena<sup>8</sup>.

The temporality or temporal length of an object is the same as its size in space. Most generally, temporality can be defined as the time interval at which the exhaustive specificity of an object (process, organism, action) can be established. The closest in content to the temporality of the concept is the characteristic time of the process.

Economic actors change over time, that is, they change temporally. The following types of temporal changes can be distinguished: external temporal changes of an economic entity that occur in relation to other economic entities that make up the external environment; internal temporal changes of the economic entity, which occur relative to the internal elements of the economic entity, which constitute the internal environment of the economic entity.

The vision of the state countercyclical regulation of the development of the agri-food sector on the basis of temporality is to maintain a stable pace of development of the agri-food sector with the achievement of a certain level of food security.

According to the vision of state regulation of the development of the agri-food sector, the main tasks are:

1) Prevention of synchronization of cycles of development of components of agro-food sector in the periods of crises and development of the program of actions of desynchronization of cycles;

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<sup>8</sup> Boldachev A. (2009) Temporalnost. [Temporality.] *Filosofskiy shturm*. Retrieved from: <http://philosophystorm.org/boldachev/1343> [in Russian]

2) Regulation of the pace of development cycles of the components of the agri-food sector, taking into account the objectives of the general economic policy of the state;

3) Prevention of coherent resonance in the system, damping of crisis extremes.

Coherent resonance in the economy arises due to the synchronization of cyclical and non-cyclical crisis fluctuations under the influence of external factors of global cyclical dynamics. This approach is a new direction of regulating cyclical dynamics and is used at the macroeconomic level in order to expand the field of stabilization synchronization in the economy by "quenching" the amplitude of stagnant cycles and creating conditions for their asymmetry. It presupposes the need for international coordination of anti-crisis policy of states within the world economy<sup>9</sup>.

Detection and consideration of coherent resonance allows develop management decisions on optimization of measures of state regulation taking into account synchronization of macroeconomic cycles.

The use of the model of coherent resonance in the state regulation of the economy allows take measures to activate each participant in the national economy as part of the structure of the national economy in the implementation of related anti-crisis policy.

Anti-crisis stabilization in these conditions is achieved by forming the optimal values of the package of state measures to intervene in economic development (sector), which form places of stabilization in the economy through "quenching" the amplitude of stagnant economic cycles, and creating conditions for their asymmetry depending on the intensity of crisis flows.

Systematic increase of state intervention (in particular through state investments) allows to use coherent-resonant effects for formation of conditions of mutual stimulation of economic activity of separate sectors and to go beyond self-sustaining crisis cyclicity, having passed to self-sustaining growing cyclicity. This direction of state regulation, taking into account the peculiarities of development, is proposed to be applied in relation to the regulation of the development of the agri-food sector.

Thus, the author's concept of state countercyclical regulation of the agri-food sector is based on the study of the causes of cyclical development of the agri-food sector, taking into account the

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<sup>9</sup> Lohynov E. (2017) *Proyavleniye kogerentnogo rezonansa mezhdu tsiklami makroekonomicheskoy dinamiki s uchetom strukturnykh kolebaniy: klyuchevaya kharakteristika tekushchego krizisa v mirovoy ekonomike i v Rossii*. [Manifestation of coherent resonance between cycles of macroeconomic dynamics, taking into account structural fluctuations: a key characteristic of the current crisis in the world economy and in Russia.] Moscow, Russia: Russian Academy of Sciences. [in Russian]



differences in their development rates, identifying synchronicity in development in the ascending and descending phases of economic development.

The temporal concept of development of the agri-food sector is built in compliance with the system of principles (Table 1).

Table 1: Conceptual principles of state regulation of the development of the agri-food sector of Ukraine on the basis of temporality

Conceptual principles	Temporal characteristics	Essence
1. Economic feasibility of government intervention	Determination of time points (markers) of enhanced state intervention in the regulation of economic processes	Is to identify explicit and latent factors that necessitate increased state intervention in the regulation of economic relations in the economic sector. Determining the degree of influence of the state.
2. Systematic	Cumulation of effect, diffusion of events	It is to respect the economic interests of all parts of the value chain, from the agricultural sector to consumers (through mechanisms to stimulate consumer demand). Vulnerabilities in the chain that require special intervention by the state should be identified.
3. Economic feasibility of the intervention	Election for state support of the link in the value chain that will push the whole system	The level of support for each link in the value chain must be weighed against their specific needs and challenges in order to maximize effect at minimum cost.
4. Differentiation of measures of state regulation depending on the phases of development of the economic system	Correspondence of time	The use of instruments of state regulation should be differentiated depending on the state of the country's economy (recovery, recovery, crisis, depression).
5. Complexity	Diversity of time, plurality of time	Interrelation of measures of state regulation, availability of feedback.
6. Sustainability in development	Plurality of time	Achieving sustainable development rates in accordance with the phases of the economic cycle in the long run.

Conceptual principles	Temporal characteristics	Essence
7. Balance	Plurality of time	It is that the action of certain instruments should be aimed at stimulating consumer demand, and others - to stimulate supply (producers). Avoidance of a negative combination of instruments of state regulation, in which the entire burden of supporting the industry will be shifted to consumers (simultaneously due to increased tax burden and higher prices for final consumer goods).
7. Synergy of effect and inertia of effect	Tension of time, fluidity of time	It consists in certain prerequisites for the use of certain instruments of state regulation and their combination in order to obtain the greatest effect in certain periods of development.
8. Time factor	Diversity of time	A clear understanding of the duration of regulatory measures. Tracking socio-economic preconditions for the application of regulatory measures. Accounting for time lag in obtaining the effect of implemented measures.
9. Coherence and coevolution	Synchrony of temporitums	Is to take into account the synchronicity of the cycles of development of the constituent elements of the system.
10. Limiting factors and risks	Probability of events	Is to take into account all the limitations of the external economic environment (including the requirements of world trade organizations).
11. Resonance	Tension of time, synchronicity of cycles	Is to take into account the synchronization of the cycles of the studied system with the cycles of exogenous factors

*Compiled by the author*

The temporal concept of the coherent-resonant paradigm of state regulation of the economy is to take into account the characteristics of time as an economic resource in achieving long-term goals of socio-economic development with counteracting the synchronicity of internal and external factors.

State countercyclical regulation of the agri-food sector of the economy on the basis of temporality is a process of purposeful influence of the state on economic relations that arise between the constituent elements of the agri-food sector and the external environment. It is carried out for the purpose of stable in time providing the population of the country with high-grade, qualitative, economically accessible foodstuff of own production.

The algorithm of state regulation of the development of the agri-food sector on the basis of temporality is shown in Fig. 1.

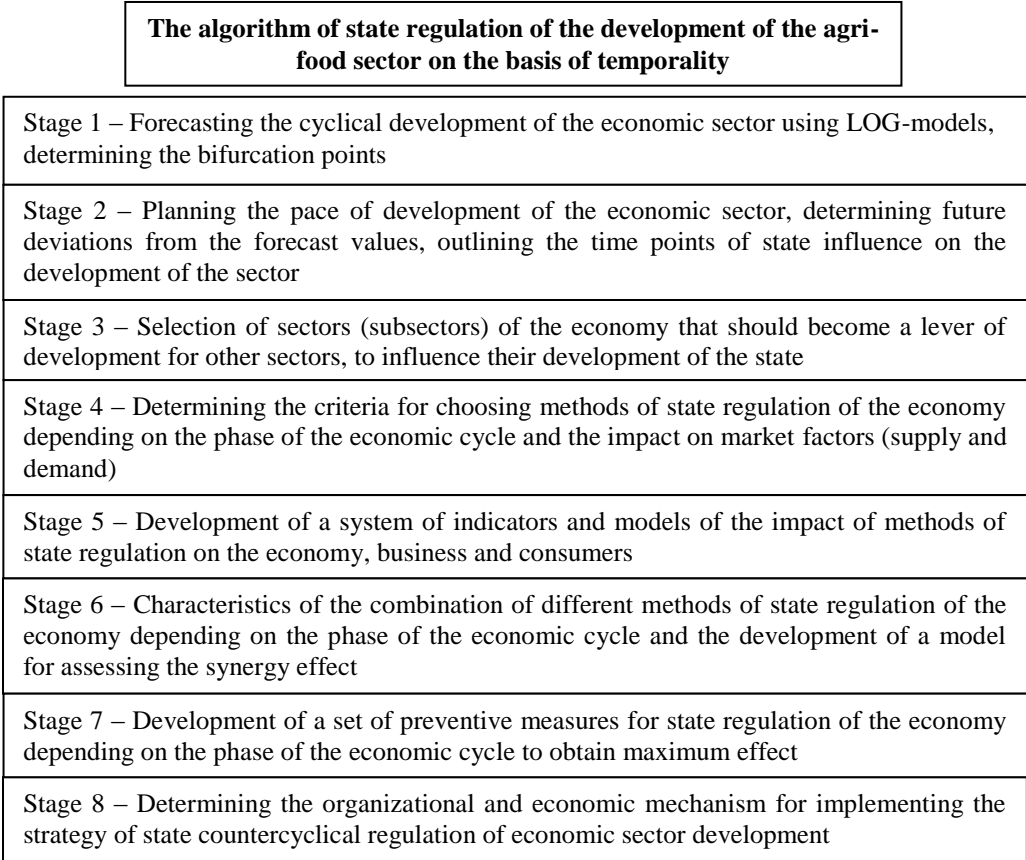


Fig. 1. Algorithm for constructing a mechanism of countercyclical state regulation of the agri-food sector of the economy

Source: developed by the author

The first stage is to study the dynamics of development of each component of the agri-food sector over a long period of time, to identify the evolutionary and cyclical component in the development of the agri-food sector and each of its components. The purpose of the stage is to identify periods of approach to the crisis state of each component of the agri-food sector, periods of synchronization of development cycles (convergence) and resonance periods in the system "agri-food sector" under the influence of external factors.

At the second stage, the pace of development of the agri-food sector is planned taking into account the objectives of the general economic policy of the country's development. The purpose of this stage is to determine the deviations of the constructed forecast model of development (at stage 1) from the planned indicators. The result of this stage is the delineation of time points of enhanced state influence on the development of components of the agri-food sector.

At the third stage, the selection of those subsectors of the agri-food sector that should become a lever of development for the entire agri-food sector, to influence their development of the state.

The purpose of the stage is to identify those points of influence of the state, the development of which will be a boost (due to the diffusion of the effect) for all other components of the agri-food sector. This will optimize government (budget) spending on sector development. At the fourth stage, the state regulation of the economy is targeted in accordance with the phase of the economic cycle and the impact on market factors (supply and demand). The purpose of the stage is to optimize the use of fiscal and monetary instruments of state regulation in accordance with the conditions of economic development and strategic objectives of the country.

In the fifth stage, a system of indicators is defined and models of the impact of state regulation on the country's economy, agri-food sector and consumers are developed. The purpose of the stage is to build models of the impact of fiscal and monetary instruments on the targets of the country, the agricultural sector and consumers. At the sixth stage, a mechanism is developed to combine different instruments of state regulation of the economy depending on the phase of the economic cycle, the need to dampen cycles, and so on. The result of the stage is the development of a model for assessing the effect of synergies from state actions.

At the seventh stage, a set of preventive measures for state regulation of the economy is being developed, depending on the phase of the economic cycle, in order to obtain the maximum effect. The result of the stage is a program of state action in periods of approaching the crisis. At the eighth stage, an organizational and economic mechanism for implementing the strategy of state regulation of the development of the agri-food sector of the economy is being developed.

**Conclusions.** The low efficiency of state regulation of the development of the agri-food sector is due to the lack of system in the application of levers of state regulation, the inconsistency of the interests of farmers, processors and consumers; lack of coordination of state actions to support and regulate the development of the agri-food sector with periods of economic development; untimely and incomplete state development programs.

Most of the identified shortcomings of public policy are related to the underestimation of the impact on the development of the economy and sectors of an important economic resource - time. Modern features of economic functioning and the course of economic processes increasingly require a heterogeneous interpretation of the economic resource - time, which becomes multi-vector, multiple, dense, differently perceived by different objects. All objects that change over time at different rates have different temporalities. By influencing the temporality of objects, you can adjust the speed of their development.

The new macroeconomic approach in countercyclical regulation of agri-food sector development is based on studying the causes of cyclical development of agri-food sectors, establishing the synchronicity of their development, studying the reasons influencing the temporality of industries and regulating their rates to prevent resonance in the system.

The temporal concept of the state countercyclical regulation of the development of the agri-food sector provides for the prevention of synchronization of the cycles of development of the components of the agri-food sector in times of crisis and the development of an action program of desynchronization of cycles; regulation of the pace of development cycles of the components of the agri-food sector, taking into account the objectives of the general economic policy of the state; prevention of coherent resonance in the system and damping of crisis extremes.

The concept of countercyclical regulation of the agri-food sector is based on the principles, among which the following are highlighted: regulation should take place along the value chain (with the identification of the most vulnerable points in the chain); regulatory measures should be consistent with each other: price, customs, tax, budget, credit, etc .; the preconditions for the use of state regulatory measures and their combination in order to obtain the greatest (synergistic) effect in certain periods of development must be clearly defined; differentiated approach to measures of state regulation depending on the state of the country's economy (rise, decline, depression) to support balanced development.

The result of countercyclical regulation of the agri-food sector is the development of preventive measures to prevent crises.

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**MODERN TOOLS FOR STRATEGIC MANAGEMENT IN THE HEALTH CARE****Rogachevskyi O. P.**

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**Abstract.**

One of the main problems of the strategic management, regardless the economic branch, is the search of appropriate tools, which can be used by it. In the article the author analysis the modern tools for strategic management. It was proposed the instrumental support for controlling in the health care management system.

**Key words:** strategic management, health care, health care system, medical institution.

The process of adapting the tools must take into account the specifics of the medical field, resource provision and the vector orientation of reform in health care. Controlling is a modern tool for strategic management in the health care.

In fig. 1 presents instrumental support for controlling in the health care management system. It should be noted that monitoring within the information-analytical function of controlling is a process of observation, evaluation, analysis of the state of certain processes, phenomena and actions in the field of public health. However, the process of systematization of analytical and synthetic information must meet the requirements that will allow the modulation of the necessary data on intra-industry processes according to common standards, taking into account the principles of analytical and individual subjects and objects of health care and controlling.

The systematic approach to the process of modulation of analytical and synthetic information is based on the relevant aspects:

- Selection of general criteria for modulation and systematization;
- Consistency between the elements of the intra-industry environment.

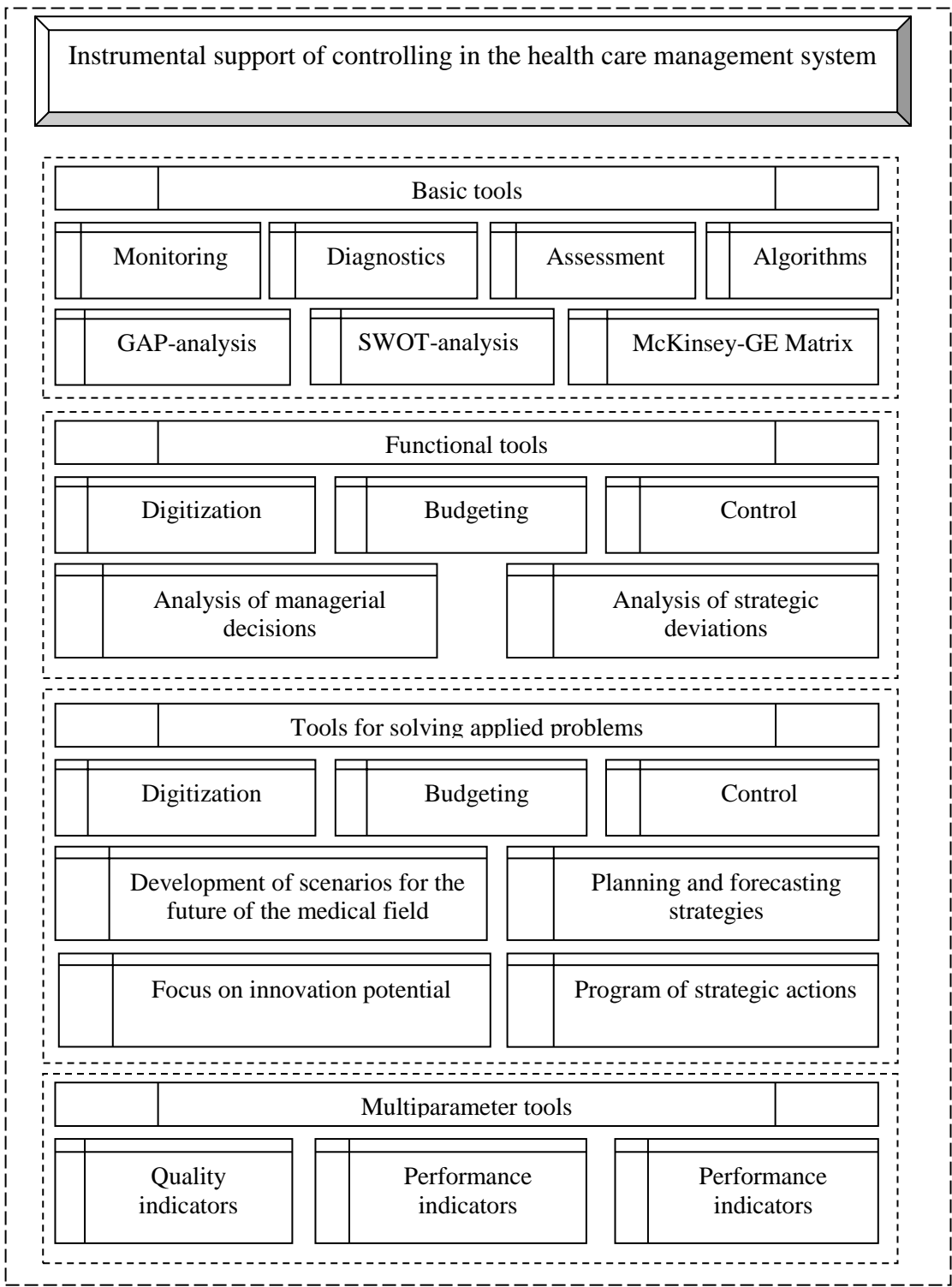


Fig. 1. Instrumental support of controlling in the health care management system



It should be agreed that the main controlling tools that should be used in the management system of health care should include:

- Analysis of future scenarios;
- Scenario analysis;
- Intra-industry strategic maps;
- Competitive analysis by Porter;
- Control of strategy;
- Method of strategic balance;
- Monitoring of target intra-industry indicators;
- Anti-crisis management plan;
- Investment planning;
- Ansoff strategy planning;
- Planning the value of human capital;
- The principle of limited rationality;
- Early warning system;
- Foresight technology;
- Balanced Scorecard;
- GAP analysis;
- SWOT-analysis, etc.

It should also be noted that the study of existing approaches confirms that the system of organizational and functional structure of intra-industry management, economic and legal methods and levers, as well as the model ratio of subjects and objects of management, is transformed into an intra-industry model that takes into account socio-economic guidelines focused on the management system of health care.

The intra-industry model has the following system properties:

- Interaction of objective and subjective factors of endogenous and exogenous direction;
- The dynamics of processes that have a stochastic nature and versatility, which is especially true in the medical field;
- The multiplicity of goals, which may not coincide with the goals of individual components of the economic model;
- Complex information processes due to the numerous relationships between the subject and the object of the model;
- The complexity of the hierarchical intra-industry structure;
- Specific features of the nature of socio-economic processes and phenomena that occur in the medical field;
- The integrity of the intra-industry system and the relationship of segment elements.

The intra-industry model of controlling in the health care management system is based on the interaction of the following elements:

- Coordination of intra-industry controlling;
- Action planning of subjects of intra-industry controlling;
- Information and analytical support;
- Monitoring of actions of subjects of intra-branch controlling;
- Diagnostics and control of actions of subjects of intra-branch controlling;
- Results of intra-industry controlling.

In the intra-industry model of controlling the corresponding signs of cyclicity and periodicity are traced. The cyclicity of elements in the intra-industry model of controlling, which takes into account the specific features of the medical field is visualized in Fig. 2.

According to the author, the application of the intra-industry model of controlling in the health care management system is a strategic step towards the development of the country's medical

sector. At the same time, it is necessary to take into account new theoretical and methodological approaches, the experience of leading countries in the global environment and strategic objectives of controlling at the appropriate macro, meso and micro levels.

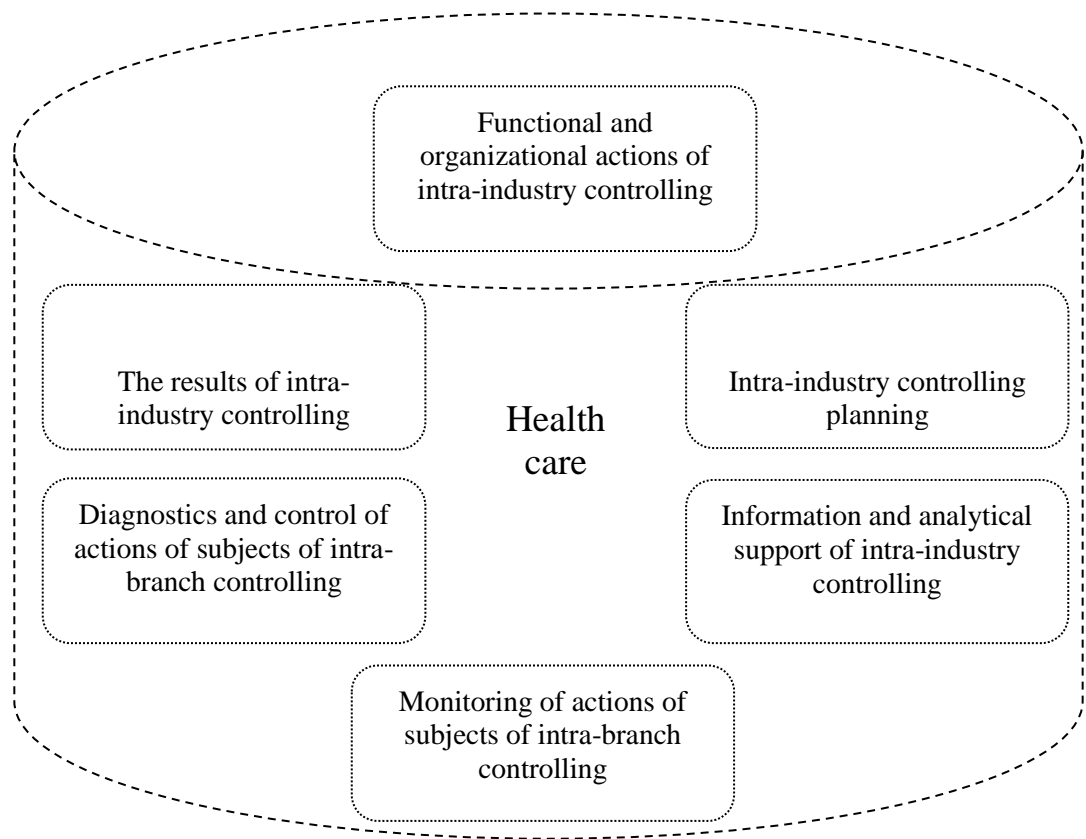


Fig. 2. Cyclical elements in the intra-industry model of controlling, which takes into account the specific features in the health care

The study of individual socio-economic processes in the field of public health requires a detailed and permanent analysis of the specifics and conditions of their occurrence in the intra-industry environment, which will avoid negative results and irreversible consequences in the medical field. To form the information component of intra-industry controlling, it is proposed to implement analytical and synthetic procedures using methods of economic and mathematical modeling, which will ensure the process of making strategic management decisions on the functioning of the medical sector and its segments. The coordination function of intra-industry controlling is distinguished by the analysis of the obtained results and the formation of tools of influence in the management system of the health care sector.

This process is provided by parametric indicators of results, which provide qualitative or quantitative characteristics of the actions of the subjects of intra-industry management and are the

basis for creating programs of targeted (priority) actions and taking into account the individual properties of each element of intra-industry management. Defining the parameters of development and formulation of intra-industry management decisions provides an opportunity to optimize and increase the efficiency of medical entities.

It should also be borne in mind that sound-synthesized and proportional use of intra-industry indicators of the medical field greatly expands not only the information boundaries of controlling, but also increases the effectiveness of appropriate management methods, which in turn ensures effective results. In the intra-industry model of controlling, informational and analytical support, which takes into account the processes of digitalization in the national environment, is of great importance. The digital transformation that has taken place since 2019 in the field of health care has led to an increase in demand for digitalization of processes in the medical field, from the provision of medical services to management.

Digitalization encourages the development of digital medicine, which has manifested itself, in particular, in the conduct of virtual clinical trials and the implementation of remote satisfaction of the needs of consumers of medical services. Note that the information component of the intra-industry model of controlling contains a set of tools that are used in the appropriate relationship. The basic set of tools consists of monitoring, diagnostics and control.

Given the specifics of the activities of health care entities, it is necessary to achieve objectivity in identifying approaches to the processes of formation of intra-industry information flows, which are the basis for further application to make management decisions that affect the functioning of the medical sector. In turn, the analytical component of the intra-industry model of controlling allows obtain balanced information through systemic and strategic analysis. The use of strategic as a tool of information and analytical support allows us to identify particularly negative phenomena and factors that affect the functioning of the medical sector of the country.

Thus, information and analytical support of the intra-industry model of controlling in the health care management system is a set of interconnected and consistent components, which with the help of integrated tools form the basis for solving strategic tasks in the medical field.

The conditions for information and analytical support of the intra-industry model of controlling in the medical field are:

- Comprehensive application of in-house controlling at all stages of the health care management system;

- The position of the model of internal controlling, which ensures the stability and dynamism of the process of support and improvement of the management system of the medical sphere, taking into account the principle of permanence and emergence;

- Focus on the digitalization procedure through the use of modern information and communication technologies and new networks in the field of health, which confirms the effectiveness and efficiency of the introduction of digital medicine in the national environment during a pandemic.

Intra-industry controlling model should also take into account the modeling process, which is based on the procedure of identification, isolation, accumulation, systematization of relevant information and calculation of a set of indicators that characterize the functional environment of the medical field, including the principles of analytical, detailed and systematic.

Modeling is not only a method of structural and functional research, but also a strategic component of controlling procedures that increase the efficiency of the health care management system.

In turn, the model in the intra-industry controlling, visualizes a kind of conditional representation of the object of the medical sphere, evaluates its parametric and integrated data, strategic priorities and possible directions of development in the national environment. Features of the object of the medical sphere, its specific properties, the state of direct and inverse intra-industry relations, as well as the content of controlling, are interpreted in the form of economic and mathematical models that allow not to pay attention to small factors and focus on important segments with a more important range of influence, while exploring the general and typical trends in health care.

Note that the models in intra-industry controlling should take into account the objectives of the strategic management system in the medical field and system criteria:

- Compliance of the developed model of the object of intra-industry controlling;
- Comprehensive coherence between the individual components of the model;

- The dynamics of the model, which allows the assessment over time and under the influence of endogenous and endogenous factors that are inherent in the medical field;

- Digitization of the process of construction and application of the model;

- Adaptation of economic and mathematical models used in the management system to the real conditions of implementation of intra-industry controlling tools in the medical field.

Note that the process of modeling within the intra-industry controlling in the field of health care, consists of targeted and compositional procedures, the number of which depends on the need to detail the object and the identified strategic objectives. The main directions of modeling within the intra-industry controlling of the healthcare sector:

- Algorithmic modeling;

- Econometric modeling;

- Economic and mathematical modeling;

- Simulation modeling;

- Situational modeling;

- Socio-economic modeling;

- Statistical modeling;

- Functional modeling.

It is proposed to use a relative indicator of its effectiveness, which is based on the method of strategic criteria and is calculated as follows: for the integrated assessment of the effectiveness of intra-industry controlling in the health care management system.

$$\left[ \begin{array}{l} MSfrp = \frac{MSfer + MSfsr}{Ver + Vsr} \\ MSfer \rightarrow \max; MSfsr \rightarrow \max \\ Ver \rightarrow \min; Vsr \rightarrow \min \end{array} \right] \quad (1)$$

$MS_{frp}$  – the effectiveness of intra-industry controlling in the medical field;  $MS_{fer}$  – economic results, UAH;  $MS_{fsr}$  – social results, UAH;  $Ver$  – economic expenses, UAH;  $Vsr$  – social expenses, UAH.

A strategic criterion is an established indicator of the health sector, which has an economic meaning and serves as a way to formalize the specific purpose of management in the medical field and is expressed through the target function through the factors of the model. Note that the evaluation of the obtained simulation results is carried out under the condition of diagnosing quantitative, graphical and other factors that confirm the solution of problems and solving negative phenomena, eliminating shortcomings in the intra-industry controlling of the health management system.

Thus, the conceptual basis and methodological support of the application of intra-industry controlling in the field of health care provides information and analytical support of the strategic management system based on a systematic approach that provides compositional and dynamic controlling procedures taking into account the constructive or destructive influence of medical factors.

The proposed methodological support for the use of intra-industry controlling consists of appropriate components of information, analytical, functional-structural and methodological support, which increases the focus on addressing specific strategic issues of health care management and its structural segments, while using tools not only general, but also special influence, which provides an opportunity to increase the effectiveness and efficiency of strategic management in the medical field. The multifaceted nature of intra-industry controlling in the medical management system is related to the multifunctionality of controlling, which is revealed through modern instrumental support and takes into account the classic levers, trends and strategic features. In general, the effectiveness of the application of intra-industry controlling in the health care system depends, first of all, on the real readiness of the management system in the medical field for its implementation.

The system of intra-industry controlling must be adapted to the specific factors inherent in the medical field. The main purpose of intra-industry controlling is related to the orientation of the

management system in the medical field on the achievement of tactical and strategic goals and the solution of relevant tasks in terms of their parameters. Intra-sectoral controlling in the field of health care is a complex system, the socio-economic essence of which is distinguished in the dynamic-structural process of transformation and integration of existing tools into a single set of obtaining, processing and transmitting sound information for intra-sectoral management decisions, development of the medical sphere of the country.

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