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*The complexity of modern social and economic systems prevents modern societies from being effective unless they are based on a competent approach to business and social decisions. The authors of the articles demonstrate how the principle of a competent approach can provide a solution for sustainable and effective development in various areas of business and social practices.*

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**THE IMPACT OF MODERN MANAGEMENT MODELS ON THE EFFECTIVENESS  
OF THE SOCIAL COMPONENT OF SUSTAINABLE DEVELOPMENT: EVIDENCE  
FROM UKRAINE**

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**Abstract.**

The chapter is devoted to the development of methodological approach to the estimation of the effectiveness of the regional social security models. The improved guidelines for evaluation of the effectiveness of the regional social security models differ from the existing ones by the following: 1) the complex use of the methodology of the regional social development diagnostics to evaluate the social security models effectiveness by separate levels: district, regional and national levels, which allows to integrate assessment from lower level to higher level and to explore the impact of the management decentralization and financing of the administrative units;

2) the use of social discomfort index, which is calculated as the sum of unemployment and inflation rates, reflects difficulties in the socio-economic sphere.

The forecast of the integrated indicator of social development of Ukraine and Ternopil region is made.

**Key words:** model, social security, social component, social development, sustainable development.

### **Introduction**

The modern mechanisms of social security must be adapted to the market conditions. The distribution methods that have been used before can satisfy neither the state authority nor the population any more. This deals with the fundamental changes that have occurred in the relationship between employers and employees, between citizens and the state, between different segments of the population. The new relationships give rise to new challenges that the social security system is designed to solve. However, the existing current realities in Ukraine indicate significant failures in the social policy implementation. There is a significant gap between the constitutional recognition status of our country as a social state and the implementation of this constitutional norm in practice. Thus, the improvement of the diagnostics methodology of the regional social development has gained a specific importance for evaluation of the effectiveness of the social security mechanism.

### **Literature review**

The development of social security in scientific practice is due to a number of regional levels of development. Many scientists researching this topic, in particular, Loggins et. al., 2019 argue that in order for the country to develop, social infrastructure must be maintained at the proper level. They also proposed the CRISIS model as a tool for education and training. Reznik et. al., 2019, in their work, examined the consequences of changes in social security policy in the context of increasing life expectancy and differential mortality. They found that increasing the retirement age to 2030 would lead to an overall reduction in benefit levels. Herd et. al., 2018 developed a targeted program to ensure a minimum adequate level of income for age through the social safety system. Waldron (2007) identified mortality and life expectancy trends for people with stable social security in the context of sustainable development. Top & Sungur (2019) argue

that public-private partnerships play an important role in the health sector of Turkey. Cruz & Marques (2013) and Yang (2019) found that the impact of human capital on economic growth is significant. Chinese scientists Zhang et. al. (2017) also showed in their work that when the level of human capital is high, social security is favorable for sustainable economic growth. Ievdokymov et. al. (2020) and Popadynets et. al. (2020) in their study proved that social security should be viewed from the perspective of social capital, as it is a limited real or potential resource of social interaction. Kinash et. al. (2019) say that the development of the country's infrastructure contributes to the improvement of social infrastructure. The study (Andrusiv et. al., 2020) focused on the fact that investment and innovation components have a decisive impact on the economic development of the regions of Ukraine, which in turn will have a positive impact on social security. Cherchata et. al. (2020) and Andrusiv et. al. (2020) prove that the level of welfare of the country's social security in the context of sustainable development directly depends on the efficiency of the implementation of business processes. Fullman et al (2017) argue that the UN's sustainable development goals must be based on a global ambition to "leave no one behind." However, some issues related to social security for sustainable development need to be further addressed. The target of the current stage of development of Ukraine is to achieve the welfare of the population through the social component of sustainable development.

**The paper aims at** analyzing the impact of modern management models on the effectiveness of the social component of sustainable development in Ukraine.

### **Methodology of the effectiveness estimation of the social security models for sustainable development.**

The development of the regional social protection in scientific practice is evaluated by a number of regional development indices. There are several models which characterize patterns of social security development in the region.

Among them, there is a Karl Gunnar Myrdal's model that reflects the relationship between the development of business and the amount of company and the population income, local budgets and regional infrastructure. The more developed economy in the region stimulates the higher people and firm revenues, that through leads the tax system to higher local budget incomes. As a result, the local governments have more opportunities to develop the social infrastructure in the region. Thus the attractive conditions for doing business and create incentives for capital inflows

into the region are provided at the next stage.

The same multiplication defines the population incomes. The developed economy needs skilled labor (that stimulates the increase of worker's salary); the secured area which provides high level of welfare and social benefits is attractive for population, which in turn contributes to increase of tax revenues to local budgets, and so on.

Herrod-Domar's model is based on the fact that the areas, which rapidly develop, with high income levels result in inflow of labor and capital. The tax increase to local budgets ensues the development of the population social provision.

By neoclassical model new emerging areas have a net inflow of capital, although income level is low and the labor force tends to outflow, that leads to lower revenue in local budgets and to reducing of social contribution. The neoclassical model is suitable for the areas that are developing on the basis of local labor using in the traditionally depressive regions.

There are other interpretations of the relationships between economic and social development of the region and the quality of life. However, there are several statements that are stable and are stored at application of any regional development model:

1. Capital flows into the areas that give the greatest feedback on invested capital.
2. The development of the main special branches promotes the additional industry growth, the expansion of services and the creation of more advanced social infrastructure for population and the intensification of economic activity.
3. The more developed industrial infrastructure creates favorable conditions for the expansion of economic activity and opening of new firms.
4. The concentration of production and non-production capital directly determines the income of local authorities. The larger budget revenues of the territory stimulate the higher investments into infrastructure and social programs.
5. A high level of personal disposable income ensures a higher level of social health, education, housing provision and so on.

The assessment of social maintenance envisages a comparison of some regional and national average indicators. However, such comparison can give only general information regarding the region's position related to the overall economic situation in the country. For a more profound analysis there are definite indicators that characterize the level of public consumption, the level of personal income and personal consumption.



In general, to evaluate the social security effectiveness the following indicators can be used: 1) infant mortality; 2) the proportion of school students who study in the second shift; 3) hospital provision; 4) hospital bed provision; 5) housing provision; 6) investment in social sphere; 7) place provision in childcare institutions; 8) average salary of employees; 9) average salary in agricultural sector; 10) retail trade turnover per capita; 11) car provision.

Indicators 1, 2, 3, 4, 6, 7 characterize the level and quality of benefit consumption from social consumption funds, namely the level of public consumption, indicators 8, 9, 10, 11 show the level of individual consumption. Indicator 5 may be used as an indicator of the level of social infrastructure development and the level of individual consumption. With the growth of the housing market, service the sector indicators of housing; medical care would be more characteristic of individual consumption rather than public consumption. It should be noted that the individual and public consumption balance is one of the most important regional development characteristics as the result of the complex of socio-economic characteristics.

At the regional socio-economic program stage of analysis another modified set of social development and living standard indicators is used. The analysis of these indicators lets clarify the economic reform need and the ways to improve the real life conditions.

According to the structure of the program all indicators are divided into four groups:

- I. Total living standard and social security indicators.
- II. The balance of income and expenses.
- III. Goods and service consumption.
- IV. Indicators of resource base development in social sphere.

Consolidated indices living standards and social security reflect income, consumer price indices for goods and tariffs for services, the level of the minimum consumer budget (MCB). The last one is an important indicator of social welfare and reflects the level of population subsistence minimum of the region.

The indicators of household income include cash income per capita per month, employee's average monthly wages (nominal and real considering price index), social transfers paid from the state budget, the social insurance fund and pension fund, and from the funds of enterprises and other public organizations.

MCB is a system of socio-economic standards and reflects the minimum socially needs of the population. This indicator shows the minimum funds needed for human life in a particular region

for the reporting period.

Consumer price indices for goods and services for the period are calculated by the Ministry of Economic Development and Trade of Ukraine.

Analysis of social security indicators allows to assess the level of unemployment in the region and to identify the non-competitive part of the population in the labor market. These indicators form the information basis to predict and ground measures for ensuring full employment and mass unemployment prevention.

The information base for the indicator calculation is formed by the labor market balance data by the regional employment institutions once a year, by the data of enterprises and organizations, executive committees of city councils and district administrations.

The indicator system of goods and service consumption reflects the situation of the consumer market, the development of retail trade and sale of services for population. The result indicators are represented in the total balance of the demand and supply of goods and services in the consumer market, in the balances of supply and demand for certain products.

For the purpose of regulation and rational resource use of convenience goods in the region the random observation should be conducted at the retail institutions of different legal forms and specialization types. This network of objects for observation must be permanent to provide a result comparison and the opportunity to determine the trend of the range and demand. For this purpose the list of studied goods should include 20-25 food and non-production goods.

Traditionally, the development of retail trade turnover is based on the statistics of the goods sales in retail trade and catering of all ownership forms and information on consumption of basic foodstuffs per capita, on the consumer goods production in the region, the balance of import - export, including import and export from Ukraine.

According to the analysis of the given above indicators the factors that have influenced the change in production and sales, should be defined, and of volume turnover of retail trade and catering should be forecasted.

The main task of service implementation sector is to meet the needs of the population in the relevant services completely, including household services and to ensure high quality and service culture. Thus the needs of the population in the relevant type of services per capita, the reached level of household network service and other type's institutions, the financial capabilities of enterprises, organizations, local budgets and the solvency of the population are the analyzed

indices. Particular attention is paid to the liberation analysis of paid service indicators, balance household income and costs. The assessment of this balancing allows predict the indicators of the real income and total solvent demand.

The information base of these indicators analysis is formed of the reporting data of statistic institutions, district administration economic departments, executive committees and relevant departments of regional administration.

Analysis of the development indicators of the material base for social infrastructure in the region is done in the following sectors:

1. Housing and communal services. There are analyzed the indicators of the housing level, its quality improvement due to the house engineering equipment perfection, that enhances comfortable accommodation; the indicators of better free of charge housing for low-income citizens or at minimum cost; the indicators of the targeted support for citizens which need better housing conditions due to queueing time and the level of their income. For municipal services the actual indicators of quality for all types of utilities (water, sewerage, gas and steam) are defined and compared with the norms of these services consumption. The calculations are performed on the housing statistic basis developed in the context of cities, administrative districts, settlements and on the statements of the enterprises and departments of public utilities.

2. Education and Culture. The educational purpose is to create the opportunities for everyone in the society to receive any level of education or educational services of other training institutions. In the socio-economic development of society the most widely spread educational services are particularly important for people. Firstly, the kindergarten and school services for youth, are characterized by: the number of pre-school children (based on materials of census and demographic calculations); number of children in permanent pre-schools, which are in the region, regardless of their subordination; the number of students in general educational institutions (based on demographics indicators of the total number of school-age children, information of children aged 6-7 years fatality and mortality, the number of school lowers during the last school year, school district material); the number of children in boarding educational institutions (based on statistical reports of their development, relevant agency information on the number of orphans, children with physical and mental defects, the number of seats in institutions). Also the data on population dynamics, its age and family composition, the current standards of education compared with actual needs are studied.

The analysis of cultural development focuses on the conservation and enhancement of cultural and historical heritage of Ukraine. For this the indicators of cultural mass institutions (libraries, clubs and cinemas), the network of theatres, museums, concert halls, philharmonics, schools of aesthetic education are compared with normative values.

3. Health care, physical culture and social security. In this section the current development level of relevant sectors, the degree availability of hospital bed and outpatient care, the state of health and preventive care by the population contingent, the state and level of the material and technical base of medical institutions, equipping them with the necessary devices and equipment, the material, medical supply and personnel provision are analyzed. The analysis of the health state in the region is made according to such indicators: the average human life expectancy; mortality of adults; maternal and infant mortality; diseases of working population, due to temporary disability (man-days per 100 employees); the bio-age and physical human testing. According to the received data, the population needs in medical care due to the nature of diseases and their actual provision are estimated. To determine the need in building hospitals their material and technical conditions on the basis of certification are analyzed, that makes possible to determine their power and the actual functioning volume of hospitals. This comparison of the medical institutions capacity and their technical conditions is the basis for making a decision for reconstruction or construction of hospitals. The important point here is the analysis of morbidity, including hospitalization, hospital beds and the technical condition.

For complex evaluation quality increase of social security mechanism in a hierarchical taxonomic unit's system, for justification of further development priorities there should be used the integrated indicators that would be sensitive to changes in space and time and would be practically applicable for use in social development determination.

One of the possible approaches of more comprehensive nature to develop the methodology of calculating the integral social infrastructure index is the use of generalized values of social efficiency level. It is determined by the scale that ranges from zero (least) to 100% (highest).

$$I = \left[ 1 - \sum_{p=1}^N V_p \cdot \frac{Y_p^n - Y_p^j}{Y_p^n} \right] \cdot 100, \quad (1)$$

Where,  $I$  - integral indicator of social performance;

$V_p = 1$ , ( $V_p$  - "weight" of indicators);

$Y_p^n$  - statutory (certification) state in terms of the process;

$Y_p^j$  - the actual state of the process according to the indicator;

$[Y_p^n - Y_p^j]$  - deviation of actual from statutory state.

The excess of actual over statutory state is not considered equivalent to "0" to prevent the compensative impact of other negative indicator deviations. The integrated synthetic weighed index of service is used for assessment of service level to determine the social infrastructure effectiveness:

$$W_i = R_i \frac{\sum_{i=1}^n q_i x_{ij}}{100 \sum_{i=1}^n q_i}, \quad (2)$$

Where,  $R_i$  – the level of service consumption adjusted for regional price index in j - region in % to the average country (or to the average regional) indicator;

$x_1 \dots x_2 \dots x_n$  – proportion of individual factor value in the region j (district) to average country (regional) indicator in % of average indicator;

$q_1 \dots q_2 \dots q_n$  – points (weights) of factor impact on the indicator results based on the correlation coefficients which allow to neutralize the impact of local conditions on the level formation of service consumption.

The synthetic indicator of rank values of their effectiveness should be used as a criteria indicator for selection of real investment social infrastructure projects. It must include the index of project profitability, the profit, and payback and effectiveness indicators: the provision of services increases for 1 UAH. Of investment, the job increases by the project, which minimum value indicates the project priority:

$$Y_j = \sum_{t=1}^s R_e \rightarrow \min, \quad (3)$$

Where,  $Y_j$  – synthetic index of j project,  $j=1 \dots$ ;

$R_e$  – rank values of project efficiency indicators.

Considering the fact, that the investment in innovation along with other important factors forms the basis for further development of effective social security mechanism, it is expedient to construct the conceptual model for selection and determination of social security priority areas.

The American non-governmental organization named Social Progress Imperative supported by the "Deloitte" company calculates the index of social development, which allows give a complete

assessment of the society increase, and identify the priorities for further growth. It is based on the assessment of three major areas: basic needs, foundations of welfare and opportunities, using 52 separate indicators. Each of them is a valuated both in absolute and in relative terms by comparing the level of countries with the same level of GDP.

The experts have identified the indicators of nativity, infant mortality, health status and migration as the most important factors of demographic development [4, c. 57].

To measure the social policy results the following parameters should be accounted:

- $d_1$  - average life expectancy at birth without differentiation by sex (years);
- $d_2$  - infant mortality rate under 1 year (‰).

Experts motivate that migration indicators affect the variation of regional demographic development. In diagnostics we should use absolute and relative indicators of migration for objective comparative analysis:

- $d_3$  - migration balance (thousand persons), it is the difference between the numbers of arrivals and departures in the given area;
- $d_4$  - intensity index of migration balance (‰), it is the ratio of migration balance to the population size.

The population material welfare is another aspect of social development that should be explored. Based on the expert opinion about the factors that affect the welfare of the population and the analysis of the indicators that were proposed by the scientists to measure that aspect of social and economic progress, we have selected the indicators of income, property stratification and poverty as the basic characteristics of the material welfare.

We propose for the welfare diagnostics to use the following indicators:

- $m_1$  - average monthly wages (UAH);
- $m_2$  - average monthly retirement benefit (UAH);
- $m_3$  - proportion of the population with average general income per month lower then subsistence level (in % from total regional population);
- $m_4$  - decile coefficient of income differentiation (times) is the ratio of minimum income (expenses) of 10% of the most abundant population to maximum income (expenses) of 10% of the most indigent population.

The validity of the education level analysis in regional social development diagnostics are based on the expert survey results that are proved by the scientists.

The indicators of population literacy, qualification and education level should be used for measurement of the social policy results in the educational sphere:

- $o_1$  - coverage of children by pre-school institutions (%). The share of children covered by pre-school institutions is calculated as the ratio of children's number in pre-schools to the total children's number of appropriate age at the beginning of the following after reporting year;

- $o_2$  - coverage number of children and teenagers by comprehensive secondary education (%). Portion of children and teenager's covered by comprehensive secondary education is calculated as the ratio of children's number at primary and comprehensive schools to total children's number of appropriate age at the beginning of the following after reporting year;

- $o_3$  - the students' number of the I and II accreditation level high educational establishments per a thousand of appropriate age people (‰);

- $o_4$  - the student' number of the III-IV accreditation level high educational establishments per a thousand of appropriate age people (‰).

Modern experienced managers define the indicators which characterize economic activity, unemployment and labor motivation as significant labor market indicators. Therefore, we recommend the measurement of next indicators:

- $r_1$  - rate of population economic activity (%). The rate of population economic activity is defined as the ratio (in percentage) of the economically active population size aged 15-70 to the total population size of that age;

- $r_2$  - employment rate of population (%). The employment rate is defined as the ratio (in percentage) of the employed population size aged 15-70 to the total population size;

- $r_3$  - unemployment rate of population according to the methodology of the International Labour Organisation (ILO) (%). The unemployment rate of population (ILO) is defined as the ratio (in percentages) of number of the unemployed population size aged 15-70 to economically active population (labor force) of the relevant age or socio-demographic characteristics;

- $r_4$  – ratio of the registered unemployment rate, and the defined rate accounted by the ILO's methodology. The level of registered unemployment is defined as the ratio (in percent's) of the unemployed population registered in State Employment Service (at the end of the reporting period) to the average number of the working-age population;

- $r_5$  – ratio of average monthly wages to the legally established minimum subsistence for able-bodied persons (%).

There are indicators which stimulate the growth contribute to the integral index of regional development increase (d1, d3, d4, m1, m2, o1, o2, o3, o4, r1, r2, r5) or which growth predetermine the decrease of the integral index (d2, m3, m4, r3, r4). The proposed methodical approach provide the different models for evaluation to introduce those components which are ranked from maximum to minimum values, and those which are ranked in the opposite direction.

For rationing the following formulas were selected:

- For stimulant indicators:

$$X_i = \frac{x_i - x_{i \min}}{x_{i \max} - x_{i \min}}, \quad (4)$$

- For non-stimulant indicators:

$$X_i = \frac{x_{i \max} - x_i}{x_{i \max} - x_{i \min}}, \quad (5)$$

Where,  $x_i$  - i-indicator value for the region;  $x_{i \min}$  - minimum indicator among the relevant regional indices (indices for the country or region);  $x_{i \max}$  - the maximum among the relevant regional indices (indices for the country or region).

Evidently all standardized indicators  $x_i$  (d1, d2, d3, d4, m1, m2, m3, m4, o1, o2, o3, o4, r1, r2, r3, r4, r5) take values from "0" to "1". Thus the regional social development model in a particular area of the social policy (D, M, O, R) has the form of the arithmetic average of "n" indices:

$$X = \frac{1}{n} \sum_{i=1}^n X_i. \quad (6)$$

This indicator has a variation interval from "0" to "1". The best integral index value of the region or the period is a value close to "1" and the worst one is a value close to "0".

Integral social development index "I" is calculated as the arithmetic average of demographic development, material welfare, education and labor market indices:

$$I = \frac{M + D + O + R}{4}. \quad (7)$$

Integral index values are into the interval from "0" to "1". The best integral index value of the region or the period is a value close to "1" and the worst one is a value close to "0".

The "social discomfort index" reflects accumulation of significant problems in the Ukrainian socio-economic sphere. It is calculated as the sum of values of unemployment and inflation rate:

$$SDI = UR + IR, \quad (8)$$

Where, UR – the unemployment rate calculated as an average share in percent of



economically active population a year (ILO);

IR - inflation rate a year.

Thus we propose to introduce the social discomfort index into the model of integral social development index for its improving:

$$I = \frac{M + D + O + R - SDI}{4}. \quad (9)$$

The proposed methodology is an open system for adding logical changes and amendments caused by changes in the regional social situation and corresponding changes of statistical survey tools.

### Result and discussion

The results of calculation of the integral index of the social development for Monastyrskyi district, Ternopil region and Ukraine form the comprehensive description of the social security effectiveness, according to the methodology described in the chapter before. For this we have formed the system of the social development indicators shown in table 1.

Table 1: The system of the indicators of the regional social development

| Indicators  | Region                | Years    |            |          |          |          |
|---|-----------------------|----------|------------|----------|----------|----------|
|   |                       | 2010     | 2012       | 2014     | 2016     | 2018     |
| 1   | 2                     | 3        | 4          | 5        | 6        | 7        |
| Average life expectancy at birth without differentiation by sex (years)   | Ukraine               | 70.4     | 71.0       | 71.2     | 71.4     | 71.4     |
|   | Ternopil region       | 73.4     | 73.4       | 73.6     | 73.6     | 73.1     |
|   | Monastyrskyi district | 74.1     | 74.0       | 74.5     | 74.5     | 74.6     |
| 1   | 2                     | 3        | 4          | 5        | 6        | 7        |
| Infant mortality rate, that is children under 1 year (‰)  | Ukraine               | 0.91     | 0.9        | 0.84     | 0.8      | 0.78     |
|   | Ternopil region       | 0.81     | 0.81       | 0.8      | 0.68     | 0.76     |
|   | Monastyrskyi district | 0.86     | 0.84       | 0.84     | 0.72     | 0.80     |
| Migration balance, thousand persons   | Ukraine               | 16.1     | 17.1       | 61.8     | 31.9     | 22.6     |
|   | Ternopil region       | -0.994   | -0.9       | -0.5     | -1       | 0.1      |
|   | Monastyrskyi district | -3.84    | -3         | -1.65    | -3.6     | -4.8     |
| Intensity index of migration balance, %   | Ukraine               | 0.04     | 0.04       | 0.14     | 0.07     | 0.05     |
|   | Ternopil region       | -0.09    | -0.08      | -0.04    | -0.01    | 0.01     |
|   | Monastyrskyi district | -0.06    | -0.04      | -0.01    | -0.06    | -0.03    |
| Average monthly wages, UAH  | Ukraine               | 2,239    | 3,054      | 3,377    | 3,283    | 3,480    |
|   | Ternopil region       | 1,659    | 1,871      | 2,185    | 2,359    | 2,527    |
|   | Monastyrskyi district | 1,211.3  | 1,499.5951 | 1,852    | 2,076    | 2,116    |
| Average monthly retirement benefit, UAH   | Ukraine               | 1,032.60 | 1,151.90   | 1,253.30 | 1,470.70 | 1,526.10 |
|   | Ternopil region       | 950.25   | 1,035.06   | 1,222.78 | 1,275.55 | 1,303.84 |
|   | Monastyrskyi district | 693.81   | 829.59     | 1,036.42 | 1,122.53 | 1,091.78 |
| Proportion of the population with average general income per month lower of subsistence level (in % from total region population) | Ukraine               | 7.2      | 5.6        | 5.2      | 5        | 4.9      |
|   | Ternopil region       | 10       | 7.9        | 6.9      | 7.3      | 6.1      |
|   | Monastyrskyi district | 22.7     | 16.6       | 11.5     | 10.6     | 8.4      |

|   |                       |       |       |       |       |       |
|---|-----------------------|-------|-------|-------|-------|-------|
| Decile coefficient of income differentiation, times   | Ukraine               | 3.50  | 3.33  | 3.33  | 3.33  | 3.33  |
|   | Ternopil region       | 3.80  | 2.50  | 2.67  | 2.67  | 3.33  |
|   | Monastyrskyi district | 2.71  | 2.49  | 3.53  | 2.33  | 3.28  |
| Coverage of children by pre-school institutions, ‰  | Ukraine               | 53    | 55    | 57    | 61    | 56    |
|   | Ternopil region       | 45    | 48    | 50    | 52    | 53    |
|   | Monastyrskyi district | 46    | 44    | 38    | 37    | 35    |
| Coverage number of children and teenager by basic secondary education, ‰                                    | Ukraine               | 88.1  | 88.2  | 88.6  | 88.9  | 89.2  |
|   | Ternopil region       | 88.7  | 89.2  | 89.6  | 89.9  | 89.7  |
|   | Monastyrskyi district | 88.7  | 89.2  | 89.6  | 89.9  | 89.7  |
| Student number in the I and II accreditation level universities per 1 thousand of appropriate age people, ‰ | Ukraine               | 4.1   | 4.3   | 4.7   | 4.4   | 4.2   |
|   | Ternopil region       | 4.6   | 4.8   | 4.8   | 4.6   | 4.5   |
|   | Monastyrskyi district | 4.6   | 4.8   | 4.8   | 4.6   | 4.5   |
| Student number in III-IV accreditation level universities per 1 thousand of appropriate age people, ‰       | Ukraine               | 6.1   | 5.8   | 5.7   | 5.3   | 5.1   |
|   | Ternopil region       | 7.4   | 6.9   | 6.3   | 5     | 5.4   |
|   | Monastyrskyi district | 7.4   | 6.9   | 6.3   | 5     | 5.4   |
| Rate of population economic activity, ‰   | Ukraine               | 63.7  | 64.3  | 64.6  | 64.9  | 62.4  |
|   | Ternopil region       | 60.6  | 61    | 61.6  | 62    | 59.6  |
|   | Monastyrskyi district | 67.5  | 68.1  | 67.7  | 68.5  | 61.8  |
| Employment rate of population, ‰  | Ukraine               | 58.5  | 59.2  | 59.7  | 60.3  | 56.6  |
|   | Ternopil region       | 54.2  | 54.6  | 55.5  | 56.2  | 52.9  |
|   | Monastyrskyi district | 62.7  | 63    | 62.7  | 63.5  | 55.9  |
| Unemployment rate of population according to the methodology the International Labour Organisation (ILO), ‰ | Ukraine               | 8.1   | 7.9   | 7.5   | 7.2   | 9.3   |
|   | Ternopil region       | 10.5  | 10.4  | 9.8   | 9.4   | 11.3  |
|   | Monastyrskyi district | 7.1   | 7.5   | 7.4   | 7.3   | 9.5   |
| Ratio of registered unemployment rate and defined rate accounted according to the ILO's methodology, times  | Ukraine               | 5.1   | 5.2   | 5.4   | 5.5   | 4.7   |
|   | Ternopil region       | 0.3   | 0.3   | 0.3   | 0.2   | 0.2   |
|   | Monastyrskyi district | 5.3   | 4.9   | 5.0   | 5.0   | 4.6   |
| Ratio of average monthly wages to legally established minimum subsistence for able-bodied persons, ‰        | Ukraine               | 257.7 | 324.5 | 314.7 | 286.2 | 285.7 |
|   | Ternopil region       | 190.9 | 198.8 | 203.6 | 205.7 | 207.5 |
|   | Monastyrskyi district | 139.4 | 159.4 | 172.6 | 181.0 | 173.7 |
| Inflation rate for the year, ‰  | Ukraine               | 9.1   | 4.6   | 0.5   | -0.2  | 24.9  |
|   | Ternopil region       | 8.5   | 3.7   | -0.8  | -1.1  | 25.4  |
|   | Monastyrskyi district | 8.5   | 3.7   | -0.8  | -1.1  | 25.4  |

Source: compiled and calculated by the author on the basis of [16]

There are some negative trends during the studied period: 1) the level of material welfare indicator for the Ternopol region is much lower than the average for the country, but the indicators of material welfare for Monastyrskyi district are lower than the average for the region; 2) the high level of the decile coefficient of income differentiation characterizes disproportional distribution of income and opportunity lack for realization of the population majority employment potential; 3) the low coverage of pre-school education adversely affects the indicators of work performance; 4) the adverse changes in indicators of labor (rise

unemployment, share decrease of the economically active population and employment) are more threatening for the Ternopil region and Monastyrskyi district, what indicates the depression of the region and its economic decline. However, the indicators of demographic development are higher for Monastyrskyi district than the average for the region and country as a whole, due to a better state of the environment.

The integral index of the social development of the Monastyrskyi district compared with the value for the Ternopil region and the average value for Ukraine is represented in table 2. It is based on the proposed system of indicators and methodology for analysis.

**Table 2: The integral index of social development**

| Indicators                           | Region                | Years |       |       |       |       |
|--------------------------------------|-----------------------|-------|-------|-------|-------|-------|
|                                      |                       | 2010  | 2012  | 2014  | 2016  | 2018  |
| Demographic development index, times | Ukraine               | 0.217 | 0.269 | 0.619 | 0.491 | 0.455 |
|                                      | Ternopil region       | 0.303 | 0.315 | 0.382 | 0.543 | 0.452 |
|                                      | Monastyrskyi district | 0.313 | 0.347 | 0.416 | 0.493 | 0.433 |
| Material welfare index, times        | Ukraine               | 0.491 | 0.671 | 0.743 | 0.801 | 0.841 |
|                                      | Ternopil region       | 0.306 | 0.634 | 0.707 | 0.737 | 0.652 |
|                                      | Monastyrskyi district | 0.209 | 0.411 | 0.384 | 0.677 | 0.520 |
| Education index, times               | Ukraine               | 0.288 | 0.361 | 0.568 | 0.500 | 0.401 |
|                                      | Ternopil region       | 0.608 | 0.726 | 0.738 | 0.592 | 0.580 |
|                                      | Monastyrskyi district | 0.618 | 0.687 | 0.623 | 0.448 | 0.407 |
| Labor market index, times            | Ukraine               | 0.497 | 0.605 | 0.622 | 0.618 | 0.421 |
|                                      | Ternopil region       | 0.341 | 0.369 | 0.433 | 0.481 | 0.275 |
|                                      | Monastyrskyi district | 0.581 | 0.615 | 0.615 | 0.664 | 0.264 |
| Social discomfort index, times       | Ukraine               | 0.172 | 0.17  | 0.121 | 0.077 | 0.347 |
|                                      | Ternopil region       | 0.19  | 0.189 | 0.135 | 0.086 | 0.367 |
|                                      | Monastyrskyi district | 0.156 | 0.112 | 0.066 | 0.062 | 0.188 |
| Integral index of social development | Ukraine               | 0.373 | 0.477 | 0.638 | 0.602 | 0.529 |
|                                      | Ternopil region       | 0.389 | 0.511 | 0.565 | 0.588 | 0.490 |
|                                      | Monastyrskyi district | 0.430 | 0.515 | 0.509 | 0.570 | 0.406 |

Source: compiled and calculated by the authors on the basis of [16, 17]

The social development integral index of the Monastyrskyi district in 2010 outstripped the levels of the Ternopil region and Ukraine by 0.049 and 0.061. In 2016 such differences dramatically reduced. Since 2018 the social development integral index of the Monastyrskyi district has significantly decreased relatively to the average for the region and the country. This trend indicates the aggravation of social inequality, the decline of the socio-economic level of the population and its poverty.

We should note the congruence of the social development index dynamics and dynamics of the labor market and the demographic development indices, what confirms the decisive influence

of the economic factors on its formation and business entities' role by contribution to the formation of employment and wages. We have observed existing interplay of mutual influences of the material welfare index and the index of education for the Monastyrskyi district. Thus we certify their interdependence through significant proportion of the social compensations and the retired benefits funded at the expense of budget social subventions and grants.

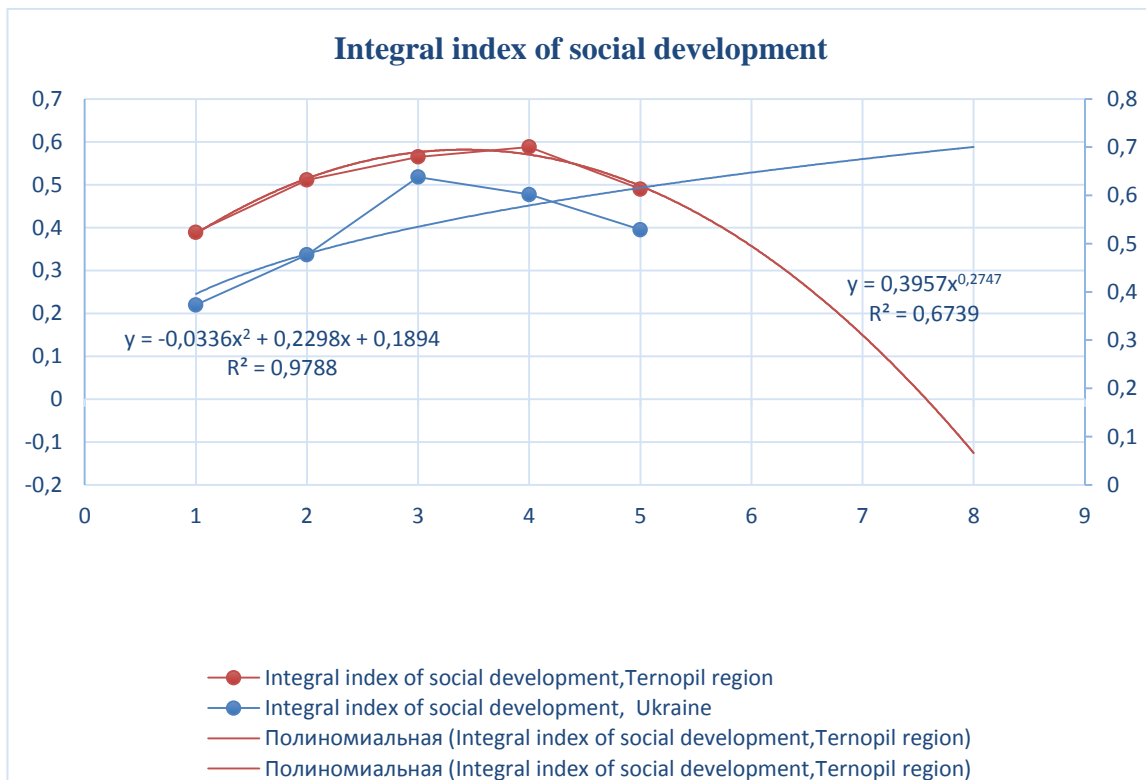


Fig. 1. Forecast of the integral index of social development of Ukraine and Ternopil region in the context of sustainable development

Source: compiled by the authors

The higher level and the stability dynamics are observed in the graph of social development integral index of the Ternopil region, due to a higher level of the material welfare index. It must be noted the dynamics coincidence of the labor market index and the integral social development index. Thus, the region is depressive, the social development and the population welfare significantly depends on the social security, guarantee and benefits levels.

The compensative effects on the integral index of social development have the indices of demographic development and education, their dynamics is shown in figure 1. The demographic growth leads to the decrease of educational standards as the result of deficiencies in the educational infrastructure. It shows the inefficiency of the social policy and the mechanism to

ensure social security in the field of education.

General in the reduction of the integral social development index of Ukraine is caused by the fall of the labor market index due to the unemployment increase, the employment decline and the proportion of the economically active population decrease in the country, it also indicates a serious threat of the nation's aging, which the European countries are facing now. Thus in Greece due to emigration of the economically active population the economic crisis increases, which leads to a reduction of social costs and living standards. The divergence in dynamics of the material welfare index and labor market index proves the inefficiency of the mechanism of the social security, but last one must provide the economic development and real income redistribution through the budget. Today there is the redistribution of the financial support from donor countries and international organizations, but it stimulates the negative economic consequences.

In our opinion the given analysis of the social level must be broadened by the social discomfort indicator research (table 1), which is calculated by formula (8).

This indicator should be used to assess the level of the social disadvantage. Its value and dynamics indicate the formation of the social-scarce economy in Ukraine, because for Germany, UK, USA and Sweden it did not exceed 12.5% from 2006 to 2012 years during the period of the global financial crisis. In Ukraine it reflects the level of the social transformation community shocked.

The social discomfort index reflects the decreasing economic threat impact on the social security and development, based on its dynamics. The crucial role of this indicator as the component of the integral index of social development is caused by a compensative effect on other components. Its application makes the assessment of the effectiveness of the social security mechanism comprehensive and reliable.

## **Conclusions**

Therefore, a systematic analysis of the indices allows synthesizing a hierarchical structure in which each indicator is independent and is a component of the total index of demographic development or material welfare, education or labor market at the same time.

The proposed methodology provides a system analysis of the regional social development at conceptual levels and presents the results in a hierarchical manner. The integral index of social

development takes the top position in the hierarchical structure and demographic development, material welfare, education and the labor market indicators are at second level, regional components of which are placed at the third level, district components are at the fourth one.

The regional field approach allows to combine regional and field differentiation of lab or most flexibly and to resolve possible conflicts between economic and social interests and needs in the regions as integral socio-economic systems. This field approach forms the methodological basis for building of conceptual models for selection of the project priority investment in social infrastructure.

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**ANALYSIS OF THE FACTORS OF THE STATE COMPETITIVENESS ON THE  
BASIS OF INDUSTRIAL ECONOMIC DEVELOPMENT INDICATORS**

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**Abstract.**

The authors of the article proved that the methodologies for calculating international indices are constantly being refined and changed, which complicates the retrospective analysis of their dynamics over time. The scientific novelty of the study is the development of practical

recommendations for increasing the competitiveness of the state taking into account the intensive and extensive indicators of sectoral economic development, which in contrast to the existing allows summarize the results of analysis using qualitative measurement scales.

**Key words:** competitiveness, intensive and extensive indicators, social component, measurement scales, sectoral economic development.

### **Introduction**

Modern technological development against the backdrop of rapid processes of globalization over time objectively changes the system of priorities that determine the competitive advantages of a particular region of the world. On the other hand, the subjects of evaluation, in this case, are certain expert environments, the conclusions of which are always subjective. As a result, the methodologies for calculating international indices are constantly being refined and changed, which complicates the retrospective analysis of their dynamics over time.

### **Literature review**

Assessment of Ukraine's competitiveness according to international ratings (Global Competitiveness Index, 2018; Shmygol N. et. al., 2020) and analysis of the works of leading scientists (Rodrik, D. et. al., 2010; Tolpegina, O. 2017; Mantserova, T., Lapchenko, D. 2019; Shmygol N. et. al., 2020) allowed to determine the following problems of development of this concept at the methodological level:

- Economic category "competitiveness of the country" is a multifaceted concept through which the assessment and interstate comparison of various socio-economic aspects of the development of regions of the world and living conditions of the population are implemented (Savchenko, T. et. al., 2019; Semerikov, S. et. al., 2020; Perevozova, I. et. al., 2019 Pinchuk, A., 2019; ). Various scientists were involved in the methodological bases of economic diagnostics, including the development of a balanced system of indicators (Semerikov, S., et. al., 2020; Kostetska, K., et. al., 2020).

In practice, this means large differences in the system of indicators of such an assessment, depending on the objectives of one or another study (Cherep, A., et. al., 2020; Maksyshko, N., et. al., 2020);

- As a rule, the components of each competitiveness index on the basis of international comparisons are plurals differing in their economic essence, units of measurement and

methodology for calculating indicators.

Certain groups of indicators can be obtained from the state statistical reporting of the countries studied on the basis of open access data. Other groups of indicators can be obtained on the basis of public reporting of various international organizations. Individual indicators can be calculated only on the basis of indirect assessment, as there is no reliable data on their status. As a result, the accuracy of calculations, objectivity and reliability of the obtained values for each specific indicator of the analysis may differ significantly from each other. This, of course, has a negative effect on the results of the generalized assessment, as the degree of its uncertainty increases;

- The composition of the international competitiveness indices of the countries considered in the previous study is not constant and may change over time due to objective and subjective reasons.

- Management of the country's competitive development on the basis of international ratings is complicated by the fact that in some cases the methodologies of their calculations in the public access are not set out fully enough and do not allow restoring the entire sequence of calculations.

Given the above, substantiation of many factors that affect the competitiveness of the country is an important scientific task that needs to be addressed and **it is the aim of this paper.**

### **Methodology of the analysis of the factors of the state competitiveness**

From the theory of economic analysis (Yale Center, 2020; Savitskaya, G. V., 2007) it is known that the composition of any system of indicators should include indicators that:

- First, describe as fully as possible the researchable aspects of the studied economic phenomenon or object;

- Secondly, they should not have functional connections with each other;

- Thirdly, they should be calculated on the basis of reliable statistical information.

Since the interstate comparative analysis of the level of competitiveness of Ukraine is problematic from a technical point of view, the actual study should predict an analysis of the dynamics of the target indicator due to the factors that determine its state.

It should also be taken into account that the assessment of competitiveness at the state level allows us to determine the general trends in the effectiveness of socio-economic development, which is an indicator of the national average. However, any economic development is not homogeneous. According to certain features, we can distinguish both centers of growth and

decline. That is why there is a need for further detailing of the target indicator on the most significant features.

A preliminary study of the international competitiveness ratings of the states in the world showed that the greatest attention of scientists was attracted by the macroeconomic development of the regions, which in turn is provided by the manufacturing sector and the efficiency of its operation. That is why, in the framework of this work, it is proposed to perform an analysis of competitiveness by sectoral indicator.

At the same time, the territory of Ukraine is also very heterogeneous on a regional basis. Each region is characterized by certain natural and climatic conditions of existence, the development of industry and labor resources, and social security of the population, which directly affects the level of its competitiveness. Therefore, the regional aspect must also be taken into account when analyzing the target.

Taking into account the above, we will analyze the current level of competitiveness of Ukraine as a whole and at the sectoral level on the main socio-economic indicators of development.

Economic growth, which is undoubtedly an indicator of the competitiveness of any country's economy, is measured by gross domestic product. The disadvantage of this indicator is that it covers only the quantitative side of this phenomenon, without taking into account the effectiveness of the changes taking place. This refers to which factors, intensive or extensive, economic growth is being achieved.

It is known from macroeconomics that the country's GDP is only a certain amount of total output. The difference between them is intermediate consumption - these are goods and services consumed by industries in the production process. The dynamics of Ukraine's GDP and total output for 2013-2017 in actual current prices is shown in Fig. 1. (State Statistics Service, 2020).

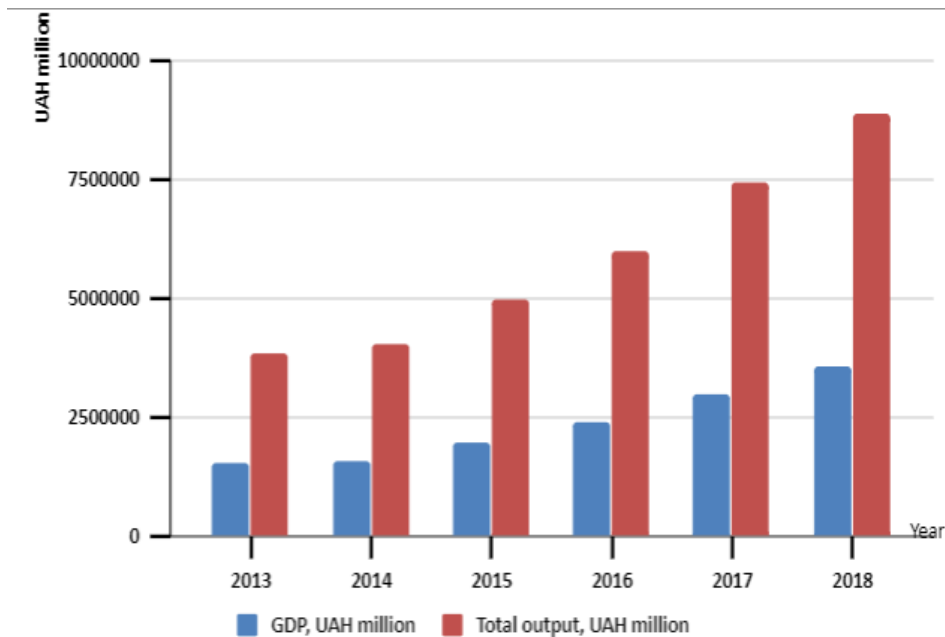


Fig. 1. Dynamics of GDP and total output for 2013-2017 at actual current prices

In this study, the time interval from 2013 to 2017 was chosen for the following reasons:

- Slow economic growth, which took place before 2013, in 2014-2015 changed to a sharp decline due to external intervention;

- The gradual recovery of the economy began in 2016 and continues to this day. The input data are statistical tables "Costs-output", which are currently completed in the reporting year 2017.

Thus, the chosen time interval will allow us to assess what changes in terms of competitiveness have occurred in the economy of a country that confronts external challenges, and adaptation to them.

From fig. 1 shows that total output over the entire range significantly exceeded GDP, which indicates the low efficiency of the manufacturing sector. That is, on the one hand, sectoral production in Ukraine is resource-dependent. On the other hand, finished products intended for final consumption are characterized by a low level of manufacturability and, as a result, low added value.

### Result and discussion

The share of value added, which indicates the efficiency of social production is calculated as the ratio of value added (column 2) to total output (column 3) and is given in table. 1.

Table 1: Analysis of GDP dynamics and the share of value added in total output according to 2013-2017, UAH mln.

| Year | Added value, UAH, million | Total output, UAH million | Share of value added in total output, % | GDP in previous year's prices, UAH mln. | GDP growth rate, % |
|------|---------------------------|---------------------------|---|---|--------------------|
| 1    | 2                         | 3                         | 4                                       | 5                                       | 6                  |
| 2013 | 1,522,657                 | 3,834,836                 | 39.71%                                  | 1,476,272                               | -                  |
| 2014 | 1,586,915                 | 4,038,547                 | 39.29%                                  | 1,382,712                               | -9.19%             |
| 2015 | 1,988,544                 | 4,980,781                 | 39.92%                                  | 1,436,855                               | -9.46%             |
| 2016 | 2,385,367                 | 6,013,152                 | 39.67%                                  | 2,036,295                               | 2.40%              |
| 2017 | 2,983,882                 | 7,440,353                 | 40.10%                                  | 2,446,376                               | 2.56%              |
| 2018 | 3,558,706                 | -                         | -                                       | 3,083,409                               | 3.34%              |

As we can see, during 2013-2017 the share of value added varied from 39.29% to 40.10% and showed a volatile dynamics of development. This is a negative trend, as it indicates the practical absence of positive changes and low competitiveness of the manufacturing sector. The growth of the country's competitiveness should be due to the development of the most technological sectors of the economy with high added value, as well as the gradual abandonment of resource-intensive production. The corresponding assessment and search for reserves for the growth of the share of value added due to structural shifts in the sectoral production of goods and services are considered below.

Another aspect of measuring pace of economic growth involves calculating dynamics based on comparable rather than actual prices. With this in mind, column (5) of table 1 shows the volume of GDP in previous year's prices, and in column (6) - the corresponding annual growth rate.

The results of calculations show that during 2014-2015 the general economic recession in Ukraine was -18.23%. From 2016 to the present, we can see a slow recovery of economic growth at 2.4% -3.3% annually. However, according to 2018 data, the volume of GDP was still 89.23% of the level of 2013. Thus, it can be argued that the country's competitiveness in terms of economic growth remains low. The causes of this phenomenon should also be studied at the industry level.

Thus, the results of a previous study indicated the country's low competitiveness in terms of economic growth and the ability to effectively create added value in the process of social production. To detail these indicators, in order to identify the causes of unsatisfactory state and possible clusters of economic growth, the need for additional analysis by industry was justified.

The calculation of shares of value added by industry according to 2013-2017 is given in table 2.

Table 2: Analysis of structural shifts in the shares of value added by industry according to 2013-2017, (%)

| №     | Industries  | Share of value added of the industry, % |           | Structural shifts, % |
|-------|---|---|-----------|----------------------|
|       |   | 2013 year                               | 2017 year |                      |
| 1     | Agriculture, forestry and fisheries                       | 36.5%                                   | 37.6%     | +1.1%                |
| 2     | Extractive industries and quarrying                       | 46.8%                                   | 46.2%     | -0.6%                |
| 3     | Processing industry                                       | 20.7%                                   | 25.7%     | +5.0%                |
| 4     | Electricity and water supply                              | 35.2%                                   | 32.9%     | -2.2%                |
| 5     | Construction  | 25.0%                                   | 23.5%     | -1.5%                |
| 6     | Wholesale and retail trade                                | 54.8%                                   | 49.6%     | -5.2%                |
| 7     | Transport, warehousing                                    | 48.8%                                   | 46.9%     | -1.9%                |
| 8     | Financial, insurance activities, real estate transactions | 69.4%                                   | 72.8%     | +3.5%                |
| 9     | Professional activity and public administration           | 64.9%                                   | 64.1%     | -0.8%                |
| 10    | Other   | 59.3%                                   | 54.8%     | -4.5%                |
| Total |   | 39.7%                                   | 40.1%     | +0.4%                |

Table data 2 allows us to assess the sectors that are ahead of the national average level of the target, or lag behind it. Also important is the trend of existing changes in recent years. We present them graphically, as shown in Fig. 2, in which the ordinal number of industries coincides with the data in the table 2.

The horizontal axis shows the shares of value added of industries in their total output according to the data of 2017. Accordingly, the vertical axis shows the structural shifts that occurred with this indicator during 2013-2017.

Dotted lines on the graph indicate the average level in Ukraine, which allows make the classification of industries on the basis of their competitiveness.

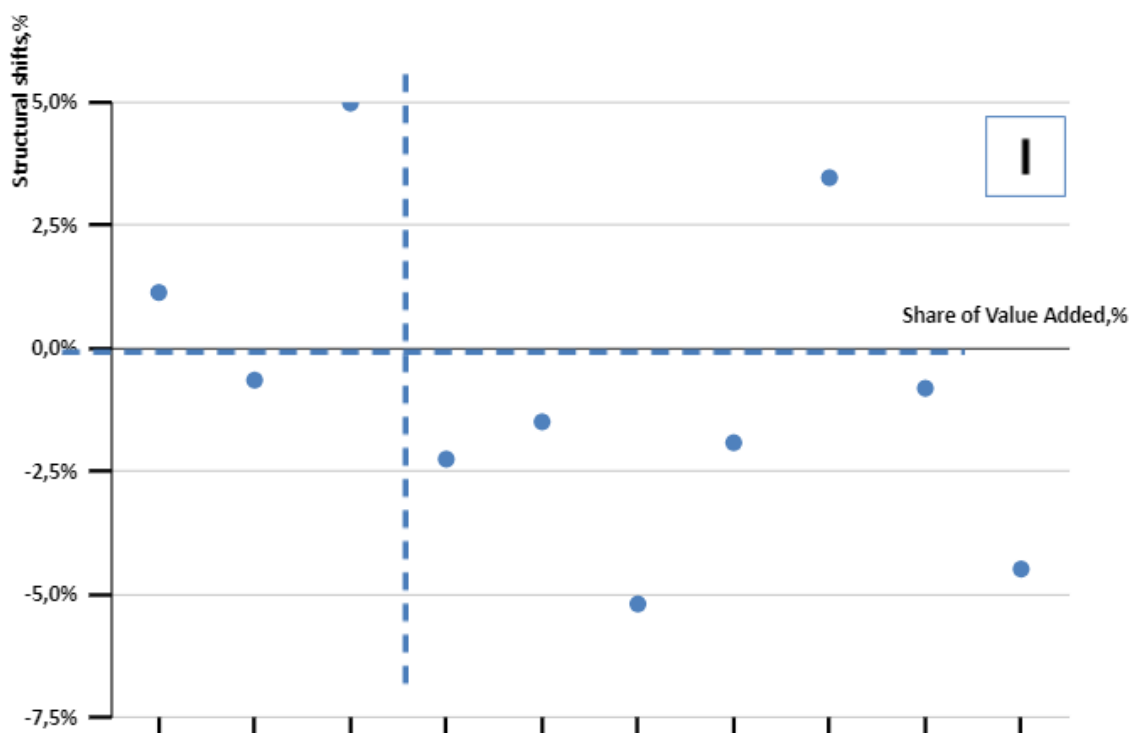


Fig. 2. Classification of Ukrainian industries by shares of value added and structural shifts according to 2013-2017

The first sector, located in the upper right corner, Fig. 2, contains the most competitive industries, in terms of these indicators. They included financial, insurance and real estate transactions. For them, the share of value added in total output was 72.8% and was characterized by further growth. Given that the country's GDP in 2017, these activities amounted to 9.6%, it can be argued that they are one of the important components that ensure the competitiveness of the economy as a whole.

The second sector is located in the lower right corner. It includes industries with a high share of value added, which exceeds the national average with a dynamic which tended to decrease. The fastest reduction of the target during 2013-2017 was in wholesale and retail trade (-5.2%), as well as in social spheres (-4.5%), such as: temporary accommodation and food, health care, art, sports and other services. The strongest competitive positions in this sector were professional, scientific, technical, administrative and public administration and defense. In addition to the above, this also includes the extractive industries and transport. If the existing negative trends continue, the loss of competitive positions will lead to their transition to the least attractive, fourth sector. The situation is complicated by the fact that the value added of these industries in the country's GDP according to 2017 was 50.2%. That is, the larger part of the economy of Ukraine lost its efficiency, increasing the share of intermediate consumption, which is negative.

The third sector is located in the upper left corner, fig. 2, and is characterized by a high level of intermediate consumption, however, the positive dynamics of growth of the share of value added. The agricultural sector has the least variation from the national average. In addition, this sector includes the processing industry, which in 2013-2017 increased the share of value added from 20.7% to 25.7%. Given that the processing industry produces more than 23.2% of the country's GDP, the growth of efficiency of its activities has had a positive impact on the overall level of competitiveness.

The sectors of the last, fourth sector are the least competitive, both in terms of the value of the target and its dynamics. This includes the construction and supply of electricity and water. It should be noted that during the economic downturn, construction is the most vulnerable, as it requires large capital investments at the time when real estate prices are beginning to decline.



With regard to electricity and water supply, the transition to market prices is constrained by low incomes of the population. Therefore, due to these factors, these industries need state attention and support.

It was mentioned above about the need to study sectoral economic growth, as the dynamics of GDP in the country in 2013-2017 was negative. It should also be borne in mind that each industry occupied a different share in the production of the final product. Thus, the impact of its development on the economic growth of the state will depend on this factor.

Relevant indicators of the sectoral structure and dynamics of Ukraine's GDP according to 2013-2017 in comparable prices are given in table. 3.

Table 3

Structure and dynamics of Ukraine's GDP by industry in comparable prices, according to 2013-2017,%

| №     | Industries  | GDP structure in 2017,% | Annual GDP growth rates in 2013-2017,% |
|-------|---|-------------------------|--|
| 1     | 2   | 3                       | 4                                      |
| 1     | Agriculture, forestry and fisheries                       | 15.5%                   | +0.1%                                  |
| 2     | Extractive industries and quarrying                       | -2.5%                   | -19.7%                                 |
| 3     | Processing industry                                       | 41.2%                   | -4.6%                                  |
| 4     | Electricity and water supply                              | 3.0%                    | +1.8%                                  |
| 5     | Construction  | 7.0%                    | -7.3%                                  |
| 6     | Wholesale and retail trade                                | 0.2%                    | -6.7%                                  |
| 7     | Transport, warehousing                                    | 5.7%                    | +1.2%                                  |
| 8     | Financial, insurance activities, real estate transactions | 5.3%                    | -10.2%                                 |
| 9     | Professional activity and public administration           | 8.7%                    | -1.0%                                  |
| 10    | Other   | 1.9%                    | -7.2%                                  |
| Total |   | 100.0%                  | -3.6%                                  |

During the recession of 2013-2015, only the agriculture, forestry and fisheries sector had an annual growth rate of + 5.8%. All other industries were characterized by a significant decline in production, exceeding -10% per annum. The exceptions were the transport sector (-0.7%) and professional activities and public administration (-1.6%).

Attention should also be paid to the specifics of the results of the extractive industry. It is that even the intermediate consumption of products in this industry in the process of social production, exceeds its total output. Accordingly, the demand for products in this industry from end users is also not assured.

Thus, in 2017, the extractive industry of Ukraine produced products worth 412547 million

UAH. At the same time, the industry of Ukraine consumed coal and lignite, oil, natural gas and metal ores in the amount of 487,784 million UAH. Thus, final consumption amounted to UAH - 75,237 million and it was offset by imports.

In spite of the negative volume of final consumption, the share of this industry in the country's GDP in 2017 was -2.5%, column (3) of table. 3.3. Accordingly, negative growth rates, column (4), indicate a decrease in the difference between intermediate consumption and total output throughout the study period, which is positive.

After 2015, the economic situation in the country has changed dramatically. Most industries have entered a trajectory of economic growth, or significantly slowed the decline. The exception was agriculture, which in 2015-2017 changed the rise to decline (-5.3%).

Thus, we can conclude that in recent years the economy of Ukraine has adapted to difficult external conditions, however, the speed of positive changes does not yet allow it to enter a stable trajectory of innovative economic growth.

To organize the objects of research, the activity of which is evaluated by a set of inhomogeneous indicators, with different units, intervals of allowable values and directions of optimization, in decision theory, qualitative measurement scales are widely used for each indicator with their subsequent bringing to the generalized ranking.

In our case, the results of such a summary, based on the above intensive and extensive factors of sectoral development, are given in table. 4.

Table 4

Ranking of industries according to the data of 2013-2017

| №  | Industries  | Ranking by characteristics |              |             |
|----|---|----------------------------|--------------|-------------|
|    |   | Share of value added       | GDP dynamics | Generalized |
| 1  | 2   | 3                          | 4            | 5           |
| 1  | Agriculture, forestry and fisheries                       | 4.5                        | 1.5          | 2.5         |
| 2  | Extractive industries and quarrying                       | 3                          | 7            | 4.5         |
| 3  | Processing industry                                       | 4.5                        | 1.5          | 2.5         |
| 4  | Electricity and water supply                              | 9.5                        | 5.5          | 8           |
| 5  | Construction  | 9.5                        | 8            | 10          |
| 6  | Wholesale and retail trade                                | 8                          | 9            | 9           |
| 7  | Transport, warehousing                                    | 6.5                        | 3.5          | 4.5         |
| 8  | Financial, insurance activities, real estate transactions | 1                          | 10           | 6           |
| 9  | Professional activity and public administration           | 2                          | 3.5          | 1           |
| 10 | Other   | 6.5                        | 5.5          | 7           |

In the table 4 a lower rank corresponds to a better value of the corresponding quantitative indicator.

### **Conclusions**

As we can see, in terms of economic development, the most competitive in 2013-2017 were the areas of professional activity and public administration.

The second place in the generalized ranking belongs to the branches of agriculture and processing industry. They are followed by the transport industry and the extractive industry.

The most problematic, from the point of view of competitiveness, were wholesale and retail trade, as well as the construction industry. Their significant lag is due to both the negative growth rate of gross domestic product and the growth of resource intensity, which negatively affects the formation of value added.

The scientific novelty of the study is the development of practical recommendations for increasing the competitiveness of the state taking into account the intensive and extensive indicators of sectoral economic development, which in contrast to the existing allows summarize the results of analysis using qualitative measurement scales.

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## **PEDAGOGICAL SKILLS AS A NECESSARY COMPONENT OF TEACHER'S PROFESSIONAL COMPETENCE**

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### **Abstract.**

The article provides a theoretical analysis of the formation of the pedagogical skills of teachers. The concepts of pedagogical skill, professional competence, pedagogical abilities, pedagogical technique are substantiated and the basic problems of pedagogical professionalism of the modern teacher are defined. The essence of the components of the semantic model of the pedagogical skill of a teacher is determined and revealed. The stages of the formation of the pedagogical skill of the teacher are described.

**Keywords:** pedagogical skill, professional competence, pedagogical abilities, pedagogical technique.

### **Formulation of the problem**

Forming a teacher as a competitive specialist, developing his skills is to identify a high level of pedagogical activity.

As a scientific problem, it arose in the XIX century and today is interpreted as the highest level of pedagogical activity. To become a master, creator, the teacher must master the laws and

mechanisms of the pedagogical process. This allows him to think and act pedagogically, to analyze pedagogical phenomena independently, to find the main pedagogical task and ways of its optimal solution. The most effective form of professional self-improvement of a teacher should be defined by the acquisition of pedagogical skills.

Undoubtedly, the problem of pedagogical skills at all stages of development of the education system in Ukraine was in the center of the attention of scientists-teachers and psychologists, teachers-practitioners. Modern Ukrainian scientists study the problem of pedagogical skills - E. Barbina, I. Ziaziun, O. Kyrychuk, N. Nychkalo, V. Oliinyk. In particular, academician I. Ziaziun argues that *pedagogical skills* are an individual contribution of a teacher to the pedagogical culture of society, and only a full understanding of the mechanisms of their own activities allows the transfer of skills to others. [5, p. 18].

**The purpose of the study:** theoretical analysis of the formation of pedagogical skills of teachers, defining the concept of pedagogical skills.

### **Presenting the main material**

Many opinions on pedagogical skills, professional education of teachers, the formation of the teacher's personality and his role in public life, set out in the legacy of leading national figures of science, education, the culture of the late XVIII - second half of the XIX century the decisive influence on the socio-pedagogical and socio-political movement of that era. The ideas of the formation and development of pedagogical skills were so important that they have not lost their relevance today.

V. Sukhomlinskii forms the model of an ideal teacher through three important positions: "First of all, this is a person who loves children, finds joy in communicating with them, believes that every child can become a good person, who knows how to be friends with children. A good teacher is, secondly, a person who knows well the science on the basis of which the subject he teaches is built, is in love with this science, knows its horizon - the latest discoveries, research, achievements. A good teacher is, thirdly, a person who knows psychology and pedagogy, understands and feels that without knowledge of the science of education it is impossible to work with children" [1212, p. 49].

Researcher V. Slastenin defines pedagogical skill as the highest form of professional orientation of the individual, and the main indicator of skill in any activity, in his opinion, is the

possession of special generalized skills [11].

In our opinion, the essence of the formation of pedagogical skills is most successfully revealed in the Pedagogical Encyclopedia: “It is a high art of education and training that is constantly improving and is available to every teacher who works by vocation and loves children. A teacher - a master of his craft - is a specialist in high culture, deeply aware of his subject, well acquainted with the relevant branches of science or art, practically versed in general and especially child psychology, who is well versed in methods of teaching and education [1313, p. 293].

In the psychological and pedagogical literature there are other interpretations of this concept: “skill - the highest level of the pedagogical activity, which is manifested in the fact that in the allotted time the teacher achieves optimal results” [13, p. 20]; “a set of personality traits that provides self-organization of a high level of professional activity on a reflexive basis” [5, p. 25]; “perfect, creative performance by the teacher-educator of his professional functions at the level of art, the result of which is the creation of optimal socio-psychological conditions for the development of students’ personality, ensuring a high level of their intellectual and moral and spiritual development” [10, p. 4].

Thus, the activity of scientists’ interest in the problem of pedagogical skills and determining its role for teacher growth necessitates the need to take into account the presented pedagogical experience in understanding pedagogical skills as a factor in the competitiveness of modern teachers.

The concept of “pedagogical skills” of a teacher implies not only the necessary high level of knowledge in the field of physical, mathematical, technical, biological or human sciences but also (which we consider the main) mastering a set of knowledge and practical skills of the teacher’s profession student, his worldview, pedagogical tact, professional responsibility.

Obviously, the pedagogical skills and creativity of the teacher are manifested in the art of interaction with students, the ability to anticipate difficulties and predict the results of finding pedagogical solutions in unusual situations, the ability to carry out organizational activities.

The study of the problem of the formation and development of pedagogical skills of teachers in educational institutions in Ukraine requires a clear definition of the semantic model of teacher formation, its main components, the integration of which ensures high productivity of the teacher. Based on the study of different interpretations of the concept of “pedagogical skill”, its structure, we consider the semantic model of the pedagogical skill of the teacher. It has the following



interconnected components:

- Professional competence (knowledge of pedagogy and age psychology);
- Professional knowledge (mastery of the content of the subject and methods of its teaching);
- Pedagogical abilities (didactic, organizational, communicative, perceptual, suggestive, scientific and cognitive);
- Pedagogical skills (the ability to organize their own pedagogical activities, educational and cognitive activities of students;
- Formulate the purpose of training, education, and development of the student's personality;
- Stimulate the work of students, monitor the effectiveness of learning);
- The creativity of the teacher (creativity and conditions of its realization in the educational process);
- Pedagogical experience (deepening of professional knowledge, expansion of erudition, improvement of methods and techniques of teaching the subject, the formation of a humane-democratic style of communication with students in the learning process);
- Personal qualities of the teacher (love for children, kindness, decency, sincerity, tolerance);
- The pedagogical technique (possession of a set of techniques that help the teacher to deeper, brighter, more talented to express themselves and achieve success in teaching and education) [6].

According to N. Kuzmina [8, p. 67] in the content of the concept of "pedagogical skill" is embedded:

- a) General high culture, erudition;
- b) Extensive and deep knowledge in the field of professional discipline;
- c) Armed with the knowledge of pedagogy, general, age and pedagogical psychology, the ability to use them in the practice of teaching and education;
- d) Mastery of the methods of educational work.

Based on the analysis of scientific sources in the structure of pedagogical skills, we have identified the following interdependent components: humanistic orientation, professional competence, pedagogical abilities, pedagogical techniques. Let's reveal the essence of these

components.

*The humanistic orientation* of activity consists in the orientation of the teacher's activity on the personality of another person, the affirmation in word and deed of the highest spiritual values, moral norms of behavior and relations; provides a humanistic manifestation of its value attitude to pedagogical activity, its purpose, content, means, subjects. He who does not love and respect children, students, can not succeed in pedagogical work, because only sincere love and deep respect of the teacher to the pupils generate appropriate love and respect for him, for his ideas, views, beliefs, knowledge that he teaches to extract.

For active cooperation with the pupils of the teacher, it is necessary to mobilize the intellect, will, moral efforts, organizational skills, and skillful operation of the means of forming moral, intellectual, and spiritual foundations in students.

Intellectual means include intelligence, the professional orientation of perception, memory, thinking, imagination, manifestation, and development of the creative abilities of the student. To moral love for children, faith in their capabilities and abilities, pedagogical justice, demanding, respect for the pupil all that is the basis of professional ethics of the teacher. Spiritual means are the basis of his general and pedagogical culture.

*Pedagogical abilities* are a set of mental characteristics of the teacher, necessary for successful mastering of a pedagogical skill, its effective realization. The main ability that unites everyone else is tolerance, sensitivity to the person, to the personality that is being formed. Communicativeness interacts closely with it; perceptual abilities; personality dynamism; emotional stability; optimistic forecasting; creativity; influence.

In the psychological and pedagogical works of I. Bekh [1], I. Ziaziun [6], the following types of pedagogical abilities are most often noted:

*Didactic* - those that form the basis of the ability to teach the material to students accessible, interesting, clear, clear. Possessing didactic abilities, the teacher will be able to show ingenuity to provoke mental activity of students, to bring something new and unusual to the educational process. The pedagogical skill of the teacher is not limited to the ability to clearly and concisely convey information to children. It is manifested in the ability to "awaken" the minds of children.

*Organizational* - are manifested, first, in the ability to organize students, involve them in various socially useful activities, create a team, and make it a tool through which the appropriate personality structure is formed. Secondly, it is the ability that allows the teacher to organize their

own activities. Accuracy, accuracy, discipline, responsible attitude to the case, concentration - these are the qualities of personality that are a consequence of organizational skills.

*Communicative* - abilities that allow you to establish the right relationship with students, which gives rise to trust and friendliness in the latter, a willingness to go with the teacher. Communicative abilities interact with organizational and together provide appropriate influence on students, management of children's collective.

*Perceptual* - the abilities that underlie the ability to penetrate into the inner world of the child. A. Makarenko noted: "You need to be able to read on a human face, on the face of a child ... There is nothing cunning, nothing mystical in the face to learn about some signs of sincere movements" [9].

Perceptual abilities equip the educator with a "second vision", the ability to capture subtle and very complex issues of the psyche, to see the mental state of the student. Perceptual abilities are the basis of live contact between teacher and students because both in class and during the break the teacher lives by mistakes and guesses of children, their findings and ideas, and that is why the ability to see everything human in a person works.

*Suggestive* - abilities that allow using a strong volitional word to achieve the desired result of the influence, this emotional-volitional influence that forces students to agree with the teacher's attitude, to accept it. Suggestive abilities are the ability to persuade. Therefore, they are closely related to the authority, volitional qualities of the teacher's personality, his belief in the correctness of his actions and deeds. It can be said that there is a dialectical relationship between the authority of the individual and the suggestive abilities.

*Scientific-cognitive (academic)* - the ability to master information, knowledge in the relevant field of science, which helps teachers to keep up with modern thought, detailed, completely free to own educational material, creatively, consistently approach the problems posed to him by educational work.

It should be noted that all pedagogical abilities are closely related and complementary.

In this context, the opinion of A. Makarenko is relevant, who argued that it is impossible to build the education of our youth based on talent: "We need to talk only about skill, that is, about real knowledge of the educational process, about educational skills. I have seen from experience that it solves the question of skill-based skill, on qualification". Becoming a master teacher is not easy, but you can learn skills [9].

The pedagogical technique (art, skill, ability) is a set of rational means, skills, and peculiarities of the teacher's behavior, aimed at the effective implementation of his chosen methods and techniques of educational work with students. It presupposes the presence of specific means, skills, peculiarities of the teacher's behavior: the high culture of speech; ability to have facial expressions, pantomime, gestures; ability to dress, watch your appearance; the ability to be guided by the basics of psychotechnics (understanding of the teacher's own mental state, the ability to manage themselves); the ability to "see" the inner state of the pupils and adequate influence on them.

Thus, pedagogical skill is a high art of education and training, based on professional knowledge, skills, and abilities. The formation and improvement of skills are necessary, first of all, in order to ensure a high level of knowledge and skills of students, to successfully solve the problems of educational work.

The strength of pedagogical skills lies in the fact that it allows teachers to build their practical activities for teaching and educating students, based on the available baggage of theoretical and practical knowledge and skills, and the results of practice to critically analyze the planned goals and objectives.

Mastery is formed in stages, with each stage being linked to the next.

*The first* – is acquaintance with the literature on this issue, with theoretical works on pedagogy and psychology, listening to lectures by experts and experienced scientists.

*The second* is to draw up a plan for improving pedagogical skills: hypotheses, studying the best practices of their colleagues, observations, demonstration lessons, discussion of lessons, etc.

*The third* is the direct implementation in their own practice of the results of scientific research and best practices, self-education, and improvement of work methods, the practice of the necessary skills, testing the effectiveness of applied methods of teaching and education, etc. [4].

Thus, the path to pedagogical skill can be expressed in sequence: vocational training - professional activity - self-education.

Analysis of the scientific and pedagogical heritage of domestic figures of education and culture suggests that pedagogical skill is a science and art, the driving factors of which are the teacher's personality, the actualization of its needs in professional self-knowledge and self-education, development of humanistic professional position, and the process of its acquisition modern teacher in the market of educational services.

The level of pedagogical skill of a teacher depends both on his focus on success in professional activities and on the formation of his professional competencies, the formation of which begins in pedagogical educational institutions. To understand the importance of acquiring a certain level of professional competence of the teacher as a whole, it is necessary to clearly define the concept of “competence”, “professional competence”, which will determine the direction of finding methods and technologies for forming such competence in teachers.

The concept of “competence” is considered in the works of I. Bekh [1], I. Ziaziun [5; 7] as the ability to perform activities, perform certain tasks or work. Under these conditions, the essence of the concept of “competence” also includes knowledge and skills that allow individuals to effectively carry out activities or perform certain functions aimed at achieving certain standards in the profession or activity. In this context, V. Semichenko considers competence as “an attribute of the personal level, a system of learned ways by which a person has the opportunity to solve certain problems, tasks of his life. Any knowledge, individual skills, and abilities become effective only when integrated into a common system of methods, enter into multilevel relationships with other elements, creatively modified, flexibly used in accordance with the goals and conditions of the activity or interpersonal interaction” [14, p.11].

*Competence* is a complex integrative quality of personality that contributes to the readiness to carry out certain activities [15, p.169-182].

This approach is not about individual knowledge or skills, not about a set of individual activities, but about the property that allows a person to carry out activities as a whole, including not only cognitive and operational-technological but also individually-significant, creative and other components of personality. After all, a modern competitive teacher must be able to teach students to creatively acquire knowledge, to critically interpret the information obtained.

Studies of native I. Bekh, I. Glazkova, T. Kolodko, O. Ovcharuk, O. Pometun, S. Priyma, O. Tishchenko and foreign F. Zimbardo, I. Zymnia, V. Kraevsky, J. Raven, A. Khutorsky scientists aim to deepen and develop the concept of competencies. We offer a list of key competencies, which are combined in three main areas: *social* - related to the social activities of the individual, the life of society; *motivational* - related to interests, individual choice of personality; *functional* - related to the field of knowledge, the ability to operate with scientific knowledge and factual material.

Researchers L. Vashchenko and V. Maslov give the following definition of professional, job-

functional competence: “one should understand the theoretical, technological (practical), as well as moral and psychological readiness of a person to perform the functions included in his duties and rights in accordance with his powers a certain position (administrative and managerial staff, specialists, methodical workers, etc.) or a certain professional orientation (scientific and pedagogical workers, teachers, masters of industrial training, etc.) to the competence defined in a particular society” [3].

Professional competence is, first of all, general erudition and perfect knowledge of the subject, pedagogical skills and ability to innovate, research activities, personal maturity, and personal achievements, etc.

Most researchers use the very concept of “*professional competence*”. Thus, T. Brazhe argues that the professional competence of people working in the system “man – man” is determined by the basic knowledge and skills, values of the specialist, the motives of his work, understanding of himself in the world and the world around him, style of relationships with people, general culture, ability to develop creative potential [2].

The category of “professional competence” is determined mainly by the level of professional education, experience, and individual abilities, motivated by the desire of the teacher for continuous self-education and self-improvement, creative and responsible attitude to work.

Professional competence presupposes the availability of professional knowledge (social, psychological and pedagogical, subject, applied skills, and abilities); their content is knowledge of the subject, methods of its teaching, knowledge of pedagogy, and psychology.

The pedagogical professionalism of the teacher is manifested in his ability to think and act professionally, which leads to the development of professional qualities and personality traits of the teacher in accordance with the requirements of the teaching profession and the necessary means to ensure not only pedagogical influence on the pupil but also interaction, cooperation, and collaboration.

The content of a teacher’s professional competence is determined by the qualification characteristics. It is a normative model of teacher competence, reflects scientifically sound professional knowledge, skills, and abilities. Qualification characteristic is, in fact, generalized requirements to the teacher regarding his theoretical and practical knowledge, skills, and abilities.

Professional competence is formed as a component of the development of professional qualities of personality: memory, logical thinking, reflection, organization, accuracy, punctuality,

emotional stability, attention, curiosity, determination, sociability. The development of these basic qualities in combination with a stable system of moral values is the basis for the formation of the competitiveness of the modern teacher.

In the process of formation of professional competence, it is important to focus on stimulating professional self-education, development of initiative, the formation of personal style of educational activity taking into account individuality and level of training.

### **Conclusion**

Thus, one of the conditions for the competitiveness of the teacher is the formation of his professional competence, which determines the results of work and popularity among the subjects of pedagogical interaction.

The formation of professional competence determines the ability of a teacher to claim recognition of his work and thus is a catalyst for the level of formation of competitiveness.

Thus, professional competence is a qualitative characteristic of a teacher's professional activity and is formed through a complex transformation of interests, motives, needs, during practice, based on the processes of awareness and rethinking. Professional competence is the basis of the skill and creativity of a specialist in any field, especially a teacher.

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**INTELLECTUALIZATION OF HEALTH CARE: OVERVIEWING INTELLECTUAL  
AND INFORMATIONAL TECHNOLOGIES IN THE HEALTHCARE SECTOR**

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**Abstract:** The paper is devoted to the issues of intellectualization in health care and the problems of information processing in electronic monitoring technologies related to the healthcare field.

The main goal of this paper is to analyze the impact of the process of intellectualization on the development of management systems in the field of health care.

This study combines analysis of the concept e-Health and mHealth. In this study complex of the general scientific and special research methods were used to achieve the goal of the study. The method of logical analysis of the literature was used. The structural analysis was used with purpose to generate the hierarchical structure of system of medical electronic monitoring. Method

of summarization was used to make a conclusion. Scientific works of Ukrainian and foreign leading scientists in this sphere were used as the informational basis for the conducted research.

This overview can serve as the base for implementing modern intellectual and informational technologies in the healthcare of countries with developing economies.

**Keywords:** intellectualization, informatization, e-Health, mHealth, medical IoT.

## **Introduction**

Modern economic development of health care worldwide is characterized by the transformation in the context of its intellectualization and informatization.

Trends of shifting from the industrial economy to the knowledge economy dictate new requirements for various sectors of the economy and areas of social welfare. Thus, the orientation of the world community on the innovative path of economic development a priori implies the dominance in the structure of its constituent factors of the intellectual and informational component.

Economic transformations, informatization and intellectualization processes of a society and economy, search for new ways to increase the organizations' competitiveness and their technological independence promote interest in developing effective means of their innovative development. Today a special place is occupied by the process of introduction of information and intellectual technologies in the practice of management in various spheres of economic activity and social welfare.

Modern healthcare trends have not escaped such trends. Global trends in healthcare management indicate the growing role of using high-tech developments not only directly in the process of providing health care, but also in the process of organizing, controlling and managing this area, aimed at improving the quality of health care, management processes at the medical institution and the effectiveness of its activities, in general. Thus, the effectiveness of these changes relies on a system-wide approach, reengineering, high-tech methods, and technological updating in the health care.

As a part of the implementation of a new course for the health care's development, which was launched on the beginning of XXI century, the use of information and intellectual technologies is given special attention by both theorists and practitioners. Since 2005, the World Health Organization (WHO) has started introducing e-health into medical practice after adopting the

special resolution WHA58.28. E-health plays a prominent part on e-Europe initiative (e-Europe).

Therefore, IT component in the field of health care, biomedical statistics, computer functional diagnostics, digital processing of biomedical signals, medical information (hospital) systems, artificial intelligence and medical expert system is very up-to-date.

But as for Ukraine, in the most cases, the intellectualization of health care management is intuitive, without the use of scientific, methodological and methodological basis, which determined the relevance of this study.

Thus, the main purpose of this study is to analyze the impact of the process of intellectualization on the development of management systems in the field of health care.

### **Materials and methods**

In the research such methods were used as the mathematic modeling and the methods of formal logic, such as method of structural-logical analysis, statistical, graphic and systemic.

The information base of the study is the scientific works of leading scientists and practitioners on the intellectualization of the economy and health care system, WHO data, data from the State Statistics Service of Ukraine and the results of own research.

The object of the research is Ukrainian health care system and the transformation process of its management system on the bases of intellectualization and informatization. The subject of the study is the economic relations, arising in the process of introducing informational and intelligent technologies into the management system of medical institutions.

### **Results**

Nowadays, technologies of the third platform (i.e. technologies coined by IDC that distinguishes the current IT environment of mobile, social, cloud and Big Data from earlier eras of computing [1]) is penetrating more and more into the field of electronic medicine.

Internet of things (IoT) forms the basis for subsequent changes in the healthcare system. Various sensors, analytical applications working with them and cloud technologies, as well as numerous mobile devices gradually change the existing approach to the diagnostics and prevention of diseases.

At the present stage of healthcare development in various countries, we can state the

beginning of the transition to the stage of comprehensive application of the instrumental model of healthcare oriented to the patient's needs.

### **E-health**

E-Health forms the technological landscape, on the basis of which a qualitative transition to a new model can be made in the future. Currently, "e-health is a general term that includes the use of ICT in clinical medicine, education, management, organization, sanitary and epidemiological surveillance, research, information, prevention, and rehabilitation" [2].

E-Health is a system of cost-effective use of information and communication technologies to support the healthcare sector. It covers a range of health services and information and intelligence technologies, including telemedicine, remote medical counseling, mobile health (mHealth), electronic medical records or medical records (eMR / eHR), electronic prescriptions, big data, media and even artificial intelligence. Also, e-health includes user devices and applications related to the field of health or medicine, the use of which does not require medical supervision [3].

Thus, the role of e-Health is crucial in achieving key health priorities, such as universal health coverage (UHS) and the Sustainable Development Goals (SDG) [2].

According to [5], the level of implementation of e-Health technologies at the state level in the European space in 2016 was:

- Top 5 leaders (in descending order): Denmark, Sweden, Estonia, Slovakia, Finland;
- Top 5 countries lagging behind in the level of e-Health implementation (in descending order): Slovenia, France, Poland, Czech Republic, Ireland [5].

Later researches are not conducted.

Main components of e-Health are the following:

- 1) *Electronic medical records* (or *electronic health record*). It is a real-time longitudinal electronic record of an individual patient's health information, assisting health professionals with decision-making and treatment;
- 2) *TeleHealth* (including *telemedicine*). It involves the delivery of health services using ICTs, specifically where distance is a barrier to health care;

3) *mHealth* (or health through the use of mobile devices). Medical and public health practice is supported by mobile devices, such as mobile phones, patient monitoring devices, and other wireless devices;

4) *eLearning* (including distance education or learning). It is presented by the use of ICTs for learning;

5) *Continuing education in information and communication technologies* includes current methods for sharing scientific knowledge, such as e-publication, open access, digital literacy, and the use of social networks for health professionals, which help them to develop information and communication technology skills for application in health;

6) *Standardization and interoperability* refers to communication between different technologies and software applications for the efficient, accurate, and sound sharing and use of data, and requires the use of standards to make the integrated management of health systems viable at all levels [6].

E-Health uses such main technologies, as:

- 1) Internet;
- 2) AI (artificial intelligence);
- 3) Machine learning;
- 4) Image recognition;
- 5) IoT (Internet of things);
- 6) Blockchain [4].

The expert system must have 4 main blocks:

1) Knowledge base, which provides the accumulation of all medical definitions, symptoms, patient data, medical histories, analysis data and patient health indicators, etc.;

2) Data entry system;

3) Model of knowledge extraction;

4) A system of explanation of decisions, which provides expert decisions on diagnosis, treatment, dynamics and predicts further diagnostic situations [4].

The generalized system of components, technologies and blocks of e-health is presented in Figure 1.

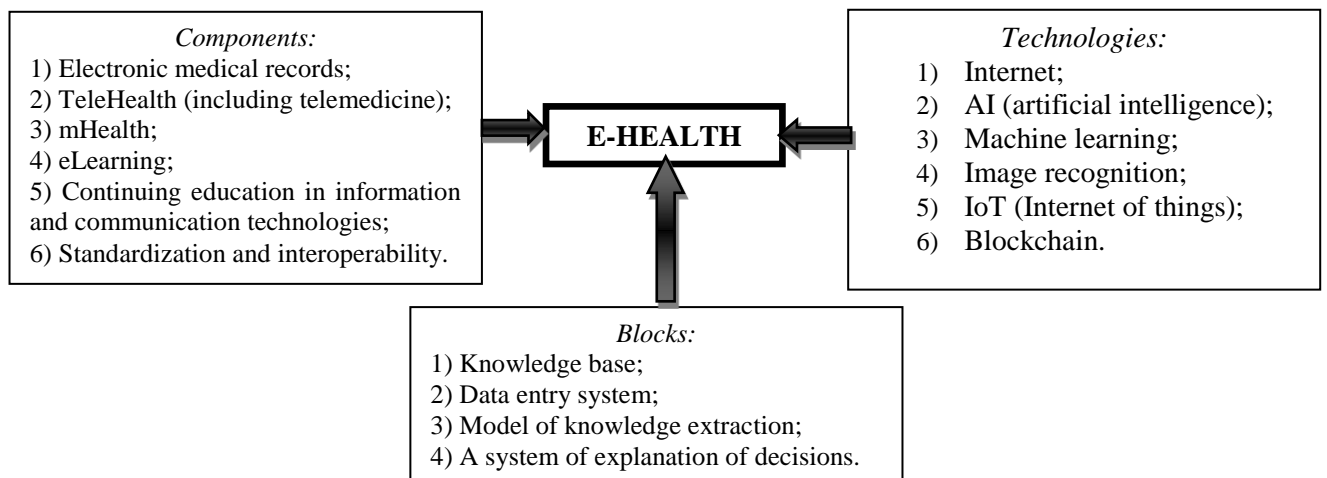


Fig. 1. Components and technologies of e-health. (formed by authors)

However, in our opinion, the use of intelligent and information technologies in the healthcare system is not limited to decision-making based on the processing of patient health indicators and decision-making based on the processing of analytical and statistical data. The following processes must be ensured: 1) making sound management decisions; 2) analysis and control over the implementation of financial and economic, medical and other activities of the medical institution; 3) accounting (accounting, management, etc.); 4) ensuring the conclusion of agreements; 5) storage of large amounts of information and automatic correction of the accumulated knowledge base.

E-Health plays an important role in the overall coverage of the healthcare system. The advantages of e-Health are:

- 1) It allows provide services to the population in remote regions and insufficiently informed communities with the help of telemedicine and mobile medicine;
- 2) It improves the training of health workers through the use of e-learning and makes education more accessible, especially for isolated regions;
- 3) It improves the effectiveness of diagnostics and treatment by providing accurate and timely information about the patient through electronic medical records;
- 4) It improves the operational and financial efficiency of health care systems [4].

## B. mHealth and medical IoT

mHealth is a part of e-health, providing medical care and monitoring a person's healthy lifestyle using wireless telecommunication technologies and mobile devices.

mHealth is a technological, medical and social "silent revolution", taking place now, which

sooner or later will significantly affect all health care in whole. Predicted by many, the era of “four P” in medicine (Predictive, Prophylactic, Personalized, involving personal involvement or involvement of the Patient) will be based on mobile medicine and will become impossible without close cooperation between the patient and the doctor through technological solutions.

World Health Organization Health in [7], 2011, officially identified mHealth as an important “service delivery tool for public health”. According to WHO, to the main tasks mHealth include: (a) expanding access to quality health care services, including sexual and reproductive health; (b) ensuring reduction premature non-infectious mortality diseases, as well as increasing global health safety [7]. Thus, mHealth technologies confidently take significant position in the arsenal of electronic health tools.

mHealth includes hardware solutions (smartphones and devices for obtaining information about the state of the body, such as analyzers, fitness trackers, etc.), mobile applications (mainly for iOS and Android) and telemedicine services, which together form a complete patient remote support service.

Mobile technologies already widely represented in the e-health segment can be divided into several functional categories. The first category represents the functions of health monitoring, diagnosis and patient care. Devices and applications in this category include: (a) pressure monitoring systems, brain function, wakefulness and sleep rhythms, heart work, etc.; (b) multiparameter monitoring systems; (c) systems of remote interaction with a doctor or medical organization; (d) diagnostic systems, including systems for rapid analysis of blood, urine, saliva, respiration, etc.; (e) chronic monitoring systems for people with disabilities, elderly and children; (f) mobile and cloud-based health monitoring applications, drug monitoring, treatment planning, etc.

Sensors that are used in modern solutions of wearable electronics, can significantly affect the quality of life and its duration for patients of various groups, as well as provide significant assistance in the diagnostic processes, rehabilitation and treatment.

The second category is related to mobile technologies in e-health and includes devices and applications designed to maintain a healthy lifestyle. The market for devices in this category is developing much faster than the previous one. The reason lies in the regulation that characterizes the medical industry. Indeed, to begin mass application of the device, numerous testing, testing, clinical researches the certification is needed. If technological solutions of the first group are

almost impossible to use without the supervision of a doctor, then solutions to maintain a healthy lifestyle are available to every consumer. Also, such solutions are often used to form the optimal treatment method.

The second group is presented on the market in the form of a wide variety of products, including physical activity trackers, sports watches, wearable sensors / heart rate monitors, as well as applications for these devices and stand-alone applications with similar functionality. Existing solutions are capable of monitoring various media health parameters.

It is interesting that already today there is a tangible demand for solutions that allow you to track a person's route and notify emergency response services about dangerous situations. Today there is *Corvus-Tracker* application for the Android operating system, which is designed to track users' mobile devices. The application sends data about the user's location on the monitoring system server. The system is also equipped with the function of sending SOS messages to the phone numbers specified in the settings. Additional system functionality allows you to create geo-zones, work on a given time, combine several users into one group, visualize system data for the user, etc.

In the future, it is possible to switch to multi-parameter sensors of medical parameters capable of collecting a sufficiently large amount of information about the patient's health status, including and through integration with other wearable devices.

The possibility of additional use together with this sensor of any technological solutions from the field of mobile healthcare will significantly increase its potential. Medical information from such sensors will be transmitted to medical institutions, and the devices themselves will be used for communication and analysis of health data.

To build a medical electronic monitoring system, solutions related to cloud technologies have to be used. In this case, three service models can be distinguished:

- Software as a service (SaaS);
- Platform as a Service (PaaS);
- Infrastructure as a Service (IaaS).

Thus, different service models can be applied to different groups of customers. For example, the SaaS model can illustrate the provision of access to the system for medical professionals – employees of medical institutions. The PaaS model can be used when a medical institution wants to access an electronic monitoring system for further providing their services to patients.



Accordingly, the IaaS model can be applied to patients or their representatives who contacted a medical institution and want to use the electronic monitoring system.

The generalized structure of the described system is shown in Figure 2.

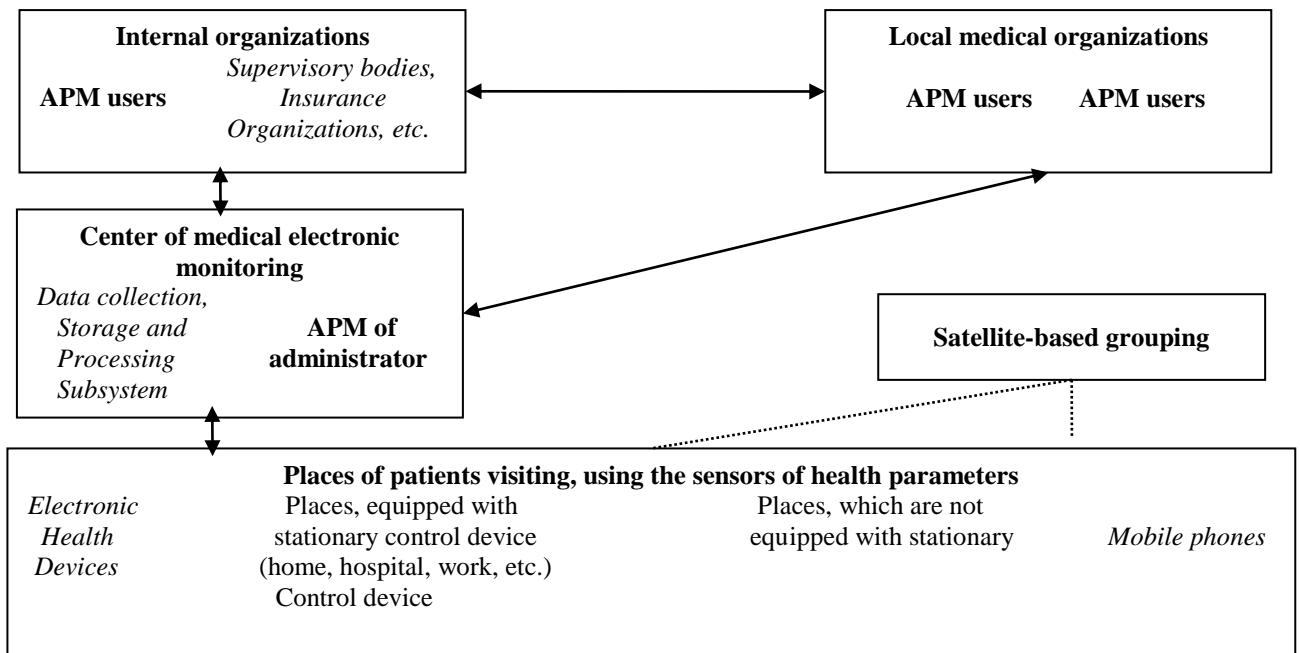


Fig. 1. Hierarchical structure of the system of medical electronic monitoring. (formed by authors)

The functionality of the medical electronic monitoring system is presented in table 1.

Table I. Functions of medical electronic monitoring system

| <i>The functionality of the medical electronic monitoring system</i>   |  |
|--|--|
| 1.   | Collection of analytical data from information systems of territorial medical institutions for subsequent evaluation of patients' activities |
| 2.   | General analysis of statistical information for the subsequent assessment of the use of the medical electronic monitoring system             |
| 3.   | Preparation of consolidated reporting  |
| <i>The functionality of the subsystem for collecting, storing and processing data of the territorial medical institution of the medical electronic monitoring system provides:</i> |  |
| 4.   | Maintenance of system directories, including registers   |
| 4.1.   | Medical units of the electronic monitoring system  |
| 4.2.   | Medical personnel for units of the patients' electronic monitoring system  |
| 4.3.   | Inventory number accounting of peripheral hardware (with information about medical departments, medical staff and patients)                  |
| 5.   | Collection of patient health data  |
| 6.   | Display on an electronic map of the location of patients who have a life-threatening condition   |
| 7.   | Distribution of medical recommendations by e-mail, SMS so on   |
| 8.   | Providing voice communication between the medical operator and the patient   |
| 9.   | Analysis of the patient's medical data for any time interval   |
| 10.  | Ensuring control of the operability of system equipment  |
| 11.  | Remote update of control unit software and workstations of system operators  |
| 12.  | Formation of reporting information based on the contents of the database   |

Source: based on the own researches.

So, miniaturization of medical devices, cheapening, and receiving data in digital form, instantly transferring this data to smartphones, and from there via Internet to cloud-based information storages, made it possible to make available in everyday practice diagnostic and therapeutic procedures previously available only in specialized medical and preventive institutions. Thus the medical IoT is instrumental in providing health care.

Such devices, based on IoT, can transmit data via Internet and accumulate them in cloud storage (*Big Data*), which gives new opportunities for monitoring the physiological functions of the human organism, remote counseling of medical professionals, automation search for knowledge in this data (*Data mining*) [8].

It is important that the use of technological solutions of the IoT allows us to achieve lower costs for the healthcare system as a whole due to remote diagnostics and, accordingly, prevention of relapse of many diseases. In the future, the spread of e-health technologies will rely on new technological solutions in this category, and the development of technologies will have a significant impact on the economic status of the medical industry.

For example, in the United States, about 75% of medical expenses are for patients with various chronic diseases. The possibility of ongoing medical monitoring can seriously reduce healthcare costs. As of 2014, in the United States, about 3 million people used remote vital signs monitoring devices. Currently, a 45% CAGR (Compound Annual Growth Rate) is projected for this market segment. By 2020 the volume of this market in the USA has approached more than 20 million devices. Today, the majority of the US market is connected to cardiac monitors connected to the network (45% of the market) and solutions for monitoring patients at bedtime (18% of the market) [7].

## **Conclusion**

E-health is in demand both by medical staff and by patients. Solutions of the medical IoT significantly reduce the medical burden caused by a large number of routine operations, due to which it is possible to pay more attention to diagnosis and treatment, and access to information in real time significantly improves the quality medical services and, in many ways, reduces the distance between the doctor and the patient.

In this case, the patient gets the opportunity to receive medical services simplified and professional monitoring of their own health.

Further development of medical electronic monitoring systems and large projects in the field of e-health should take into account the need for intellectualization of the system at the level of end users of the medical parameters sensor and ICS. Otherwise, the created IP will face congestion of servers and information transmission channels, as a result of which operating costs will increase, and the processing speed of collected medical data will decrease.

In the future, other components of the third platform, such as social networks and cloud solutions, will actively penetrate the e-health sector. The development of these segments of the third platform in medicine depends, first of all, on the creation of the e-health infrastructure, which will be based on electronic medical monitoring of the patient's health, the collection of information and its further transmission to medical institutions.

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AGRARIAN POLICY OF UKRAINE, EU COUNTRIES, CANADA AND RUSSIA:  
COMPARATIVE ANALYSIS, PROBLEMS, AND PERSPECTIVE DIRECTIONS

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**Abstract.**

The measures of state regulation of the development of the agri-food sector of Ukraine are significantly different from the EU countries and other countries. The requirement for Ukraine's accession to the WTO is to coordinate measures of direct state support of the agricultural sector with other countries. The main condition is to minimize the measures of state support of the agricultural sector, which "distort" foreign trade, that is, directly affect the market price of agricultural products. This actualizes the question of researching measures of state support for commodity producers in Ukraine, an assessment of their effectiveness and comparison with indicators of developed countries. A comparative analysis of the effectiveness of the introduced state support measures reveals the problems of the agrarian policy of Ukraine, contributes to the development of measures to improve it and bring it closer to the policies of developed countries, including the EU countries.

**Key words:** government regulation, agri-food sector, government support measures, support of agricultural producers, support of customers, support of infrastructure, market price

**Introduction**

Ukraine's GDP level in 2017-2018 is significantly lower than the GDP of both the countries of the European Union and the CIS countries<sup>1</sup>. The Ukrainian economy is becoming increasingly dependent on the development of the agricultural sector. The share of agriculture in GDP is on average about 10%, and in total employment of the population – almost 17%<sup>2</sup>. About half of the total value of agricultural products is created in large farms, while the other part is accounted for

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<sup>1</sup> (2017) Standard of living. *Ukrainian election. The right of the people*. Retrieved from: [http://vybor.ua/topics/uroven\\_jizni.html](http://vybor.ua/topics/uroven_jizni.html)

<sup>2</sup> (2017) *The country's GDP per capita rating in 2017*. Retrieved from: <http://investorschool.ru/rejting-stran-po-vvp-na-dushu-naseleniya-2017>

by small producers. Producers of small and medium-sized businesses have a marked lack of investment. Their activities are characterized by low efficiency. The development of the agricultural sector, which is one of the most important in the Ukrainian economy, requires qualitative transformations that can improve the competitiveness of agricultural production in both the domestic and foreign markets, and strengthen the food security of the state. The fulfillment of this task is connected with the determination of the strategic directions of the agrarian policy of the state, the establishment of an optimal ratio in state support of producers and the effective functioning of market mechanisms, the integration of the agrarian sector of the country's economy into the world economic system.

### **Recent research and problem definition**

Among the instruments of state regulation of the agri-food sector, a significant place belongs to state support. State support of the agri-food sector is a system of legislative and institutionally defined budgetary measures and funds aimed at the formation and operation of a competitive sphere, economic, legal, informational and organizational determinants of the formation and development of the agricultural sector<sup>3</sup>. All instruments of state support for agriculture in post-industrial countries are closely related to the goals of the agrarian policies of these states.

The size and form of state support for agricultural producers are constantly being studied and evaluated by a number of international organizations. In particular, the Organization for Economic Cooperation and Development (OECD) since 1987 uses a standard methodology for measuring the financial value of government transfers to agriculture of its member countries in order to compare interventions that states implement to achieve the goals of their agricultural policies<sup>4</sup>. The complexity and number of government measures to support agriculture is constantly growing. The methodology for assessing state support for agriculture is based on the assessment of support for agricultural producers, consumers of agricultural products and general services for agriculture<sup>5</sup>.

The method of assessing the support of agricultural producers allows to evaluate the effectiveness of government measures in the agricultural sector of the country over time and to compare the results of calculations with those of other countries. This makes it possible to

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<sup>3</sup> Borodina O., Lopatinsky Yu. (2009) *Support of the agrarian sector in the system of state regulation of the economy*, 44.

<sup>4</sup> (2017) *Agricultural policies in OECD and emerging economies: Monitoring and Evaluation 2017*. Retrieved from: [www.oecd.org/tad/agricultural-policies/AgMon\\_2017Ukraine\\_RUS.pdf](http://www.oecd.org/tad/agricultural-policies/AgMon_2017Ukraine_RUS.pdf)

<sup>5</sup> (2020) Methodology for the measurement of support and use in policy evaluation. *Organization for economic co-operation and development*. Retrieved from: <http://www.oecd.org/dataoecd/36/47/1937457.pdf>

optimize budget expenditures on the development of the agrarian sector and to improve the measures of the agrarian policy and increase the competitiveness of the country.

Such outstanding scientists as M. Demyanenko<sup>6</sup>, P. Haidutsky<sup>7</sup>, A. Mogilny<sup>8</sup>, B. Paskhaver<sup>9</sup>, P. Sabluk<sup>10</sup>, etc., were engaged in research on the reform of the agrarian sector of the economy of Ukraine. In the scientific works of I. Kobuta, A. Mogilny, D. Mishchenko<sup>11</sup> considerable attention is paid to the methodological foundations of the justification of the level and evaluation of the effectiveness of state support for agriculture. But there remain unresolved questions of the appropriateness and effectiveness of the application of measures of direct regulation and the development and implementation of an effective, aimed at supporting the market balance of supply and demand mechanism for indirect regulation of the agricultural sector.

**The aim of the research is** to analyze state support measures for commodity producers in Ukraine, assess their effectiveness and compare them with indicators of developed countries. A comparative analysis of the effectiveness of the introduced state support measures reveals the problems of the agrarian policy of Ukraine, contributes to the development of measures to improve it and bring it closer to the policies of developed countries, including the EU countries.

### **Research result**

The share of aggregate agricultural support from Ukraine's GDP has a cyclical trend: it reaches its highest value every four years. The highest value (3.32%), this figure reached in 1997.

The support of agricultural producers for the period of existence of an independent Ukraine was carried out using both direct (budgetary payments) and indirect (supporting the market price) measures.

The largest share in total agricultural support comes from the support of agricultural producers. The rapid deterioration of the situation with state support for producers of agricultural products has been observed since 2013. Indicative of this is the fact that such a support tool as transfers to consumers from the budget is not used at all in Ukraine. Support for agriculture is carried out mainly through the support of producers.

Transfers from taxpayers exceed the amount of funds received by both agricultural producers

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<sup>6</sup> Demyanenko M., Sabluk P., Scupoy V. (2011) *State policy of financial support for the development of the agrarian sector of the agro-industrial complex.*

<sup>7</sup> Haidutsky P. (2005) *Agrarian reform in Ukraine.*

<sup>8</sup> Mogilny O. (2002) *State regulation of agrarian production in the period of the transformation of the economy.*

<sup>9</sup> Paskhaver B., Shubravskaya O., Moldavan L. (2009) *Challenges and ways of agro-food development.*

<sup>10</sup> Sabluk P. (1997) *Features of Agrarian Reform in Ukraine.*

<sup>11</sup> Mishchenko D. (2014) *Mechanisms of state regulation of the agrarian sector development of Ukraine's economy: theory and methodology.*

and the industry as a whole. Of the total support, manufacturers receive more than 50%, the rest is spent on the provision of common services.

In the support structure of producers, indirect support measures dominate through the mechanism of influence on the market price. Studies show that in most years domestic prices for products are lower than world prices; therefore, manufacturers receive less revenue due to excessive taxation. This also happens in cases where export of products is restricted and while import duties are reduced.

Despite the fact that from 1996 to 2014 direct payments from the budget per 1 ton of products were made, they did not work as compensators for the losses of producers. And since 2015, these payments have been completely terminated.

The study of the dynamics of regulatory measures to support manufacturers has shown that there is a noticeable cyclical nature. The largest share in the structure accounts for the indicator of support for the market price, which has a cyclical component. In most years of the study period, government support is characterized by an unbalanced pricing and foreign trade policy.

It should also be noted that in the years of significant excess of domestic prices over world prices, when the burden of high prices for products was transferred to the consumer, the budget did not provide for transfers to consumers, but on the contrary, the industry was additionally financed through direct support mechanisms.

The inconsistency of state measures in support of producers is noticeable in those years when, when domestic prices exceeded prices at the border (world), budget payments were additionally made.

It should be noted that the main burden of supporting the development of crop production has been transferred to consumers, who have to pay the price for agricultural products in the domestic market more than in the world market. Budget transfers are chaotic, inconsistent, carried out according to current needs. The situation is somewhat different in the livestock market. The beef producers have significant support from the state in the form of budget transfers.

An analysis of the expenses of the State Budget of Ukraine directed towards the needs of the Ministry of Agrarian Policy and Food showed that the state is narrowing the scope of state support for the agricultural sector of the economy. With the entry of Ukraine into the WTO and the requirements to reduce support for measures that affect the level of trade, there has been a significant reduction in costs in most areas of support. In some areas funding has generally been



terminated.

It should also be noted that there is no systematic approach to supporting the development of the agricultural sector and the connection with the economic situation in the country, and there is also a chaotic financing of measures aimed at solving today's problems.

In those years when domestic prices exceeded the level of world prices all the burden for high prices was transferred to consumers. At the same time, transfers to consumers were not applied at all in Ukraine. In addition, during this period, the agricultural sector was additionally financed from the budget through direct support mechanisms, which, in our opinion, distorted the essence of the support mechanism.

The percentage of consumer support is an implicit tax on consumers (or their subsidies), which consumers pay (or receive) under the influence of measures of state support for the agricultural sector. It reflects part of consumer spending on agricultural products, which they lose (or receive) as a result of government policy actions.

In most years of the existence of Ukraine as an independent state, national consumers paid prices for agricultural products higher than world prices, so consumers pay an implicit tax.

Direct support to consumers of agricultural products in Ukraine is not provided. Implicit consumer support is estimated through the values of the indicator “transfers to producers from consumers”. In most years, no consumer support has been provided through the market price mechanism or direct subsidies from the budget.

The main EU requirements for Ukraine in matters of European integration is the reduction of state support measures for the agri-food sector, mainly it concerns direct support measures. The Ukrainian government is quite vividly fulfilling these requirements, despite how it affects the competitiveness of the Ukrainian economy.

Research into the implementation of measures to support the agri-food sector in the EU, Canada, Russia and Ukraine suggests the opposite.

The dynamics of the aggregate support for agriculture in these countries from 2013 to 2017 is given in Tab. 1.

Table 1: Indicators of total agricultural support in the EU, Ukraine, Russia and Canada in 2013-2017, Millions of dollars<sup>12,13,14</sup>

| Country        | 2013             | 2014             | 2015             | 2016             | 2017            |
|----------------|------------------|------------------|------------------|------------------|-----------------|
| Canada         | 7,724.71         | 6,639.01         | 5,751.58         | 6,145.53         | 6,171.61        |
| EU countries   | 140,092.97       | 121,685.25       | 107,266.63       | 111,591.48       | 104,500.90      |
| Russia         | 18,057.28        | 15,227.24        | 11,429.63        | 11,871.90        | 11,410.72       |
| <b>Ukraine</b> | <b>-1,539.18</b> | <b>-2,801.94</b> | <b>-1,901.18</b> | <b>-2,168.11</b> | <b>1,903.91</b> |

*Compiled by the author based on sources*

Dynamics of the level of general support for the agri-food sector of the countries studied (except Ukraine) for the period 2013-2017 indicates the presence of such trends in the rate of change of expenses: a decrease in expenses in 2015, followed by a slight increase. In these countries, the level of general support is positive, unlike in Ukraine. This was due to the negative value of the indicator of support for agricultural producers, which arose due to the excess of the border prices for agricultural products over the domestic producer prices.

Table 2: Indicators of support of agricultural producers in the EU, Ukraine, Russia and Canada in 2013-2017, Millions of dollars

| Country  | 2013             | 2014             | 2015             | 2016             | 2017             |
|--|------------------|------------------|------------------|------------------|------------------|
| <b>1. Absolute value of producer support indicator (PSE)</b> |                  |                  |                  |                  |                  |
| Canada   | 5,427.58         | 4,553.33         | 4,013.35         | 4,436.33         | 4,533.58         |
| EU countries   | 122,790.31       | 106,156.50       | 93,771.37        | 99,987.30        | 93,149.68        |
| Russia   | 13,536.48        | 12,527.19        | 9,477.18         | 10,492.19        | 8,750.07         |
| <b>Ukraine</b>   | <b>-2,196.34</b> | <b>-3,095.29</b> | <b>-2,016.04</b> | <b>-2,277.74</b> | <b>-2,042.70</b> |
| <b>2. Nominal producer support rate (NAC)</b>                |                  |                  |                  |                  |                  |
| Canada   | 1.11             | 1.10             | 1.06             | 1.11             | 1.11             |
| EU countries   | 1.25             | 1.22             | 1.23             | 1.26             | 1.22             |
| Russia   | 1.15             | 1.15             | 1.15             | 1.17             | 1.14             |
| <b>Ukraine</b>   | <b>0.95</b>      | <b>0.92</b>      | <b>0.93</b>      | <b>0.92</b>      | <b>0.93</b>      |

*Compiled by the author based on sources*

<sup>12</sup> (2020) Producer and Consumer Support Estimates database. *Organization for economic cooperation and development*. Retrieved from: <http://www.oecd.org/countries/ukraine/producerandconsumersupportestimatesdatabase.htm>

<sup>13</sup> (2020) Agricultural support. *Organization for economic cooperation and development*. Retrieved from: <http://www.oecd.org/tad/agricultural-policies/producerandconsumersupportestimatesdatabase.htm#browsers>

<sup>14</sup> (2013) Ukraine. *Agricultural Policy Monitoring and Evaluation*. Retrieved from: 10.1787/agr\_pol-2013-26-en

The nominal indicator of support for agricultural producers in all countries except Ukraine is more than 1.0, which indicates that national producers, taking into account all budget transfers, receive incomes higher than those that can be obtained under the condition of free trade. In Ukraine, this indicator is less than 1.0, which reflects the situation when producers get revenues for their products lower than those that can be obtained from selling products at world prices. Therefore, the interest of Ukrainian producers in the sale of agricultural products on the world market is understandable, protectionist sentiments of the EU countries regarding products of Ukrainian producers are also reasonable.

The assessment of support for the development of the agri-food sector is not complete without a study on the support of consumers of agricultural products. The absolute value of the indicator reflects the amount of consumer spending on agricultural products that they lose (if CSE is less than 0) or receive (if CSE is greater than 0) as a result of government policy actions. But for the objectivity of the findings, compensation payments from the state, which consumers receive as a result of negative manifestations of government policy, should be investigated.

Table 3: Indicators of support to consumers of agricultural products in the EU, Ukraine, Russia and Canada in 2013-2017, Millions of dollars

| Country  | 2013            | 2014            | 2015            | 2016            | 2017            |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>1. Absolute value of customer support indicator (CSE)</b> |                 |                 |                 |                 |                 |
| Canada   | -4,150.56       | -3,201.34       | -2,828.72       | -3,302.94       | -3,321.71       |
| EU countries   | -27,773.45      | -23,726.5       | -15,783.09      | -19,991.16      | -18,829.65      |
| Russia   | -8,431.97       | -10,211.03      | -7,125.27       | -7,867.59       | -7,468.07       |
| <b>Ukraine</b>   | <b>2,327.33</b> | <b>2,975.43</b> | <b>1,813.21</b> | <b>1,903.41</b> | <b>1,387.16</b> |
| <b>2. Nominal customer support rate (NAC)</b>                |                 |                 |                 |                 |                 |
| Canada   | 1.14            | 1.11            | 1.11            | 1.13            | 1.13            |
| EU countries   | 1.06            | 1.05            | 1.04            | 1.05            | 1.04            |
| Russia   | 1.08            | 1.11            | 1.11            | 1.13            | 1.11            |
| <b>Ukraine</b>   | <b>0.92</b>     | <b>0.87</b>     | <b>0.90</b>     | <b>0.89</b>     | <b>0.92</b>     |

*Compiled by the author based on sources sources*

Nominal consumer support rate (NAC), which is greater than 1.0, is observed in all countries studied, except Ukraine. This indicates that consumers pay for agricultural products prices higher than world prices. In Ukraine, the explicit support of consumers of agricultural products is not

implemented.

Table 4: Indicators of support for the development of agricultural infrastructure in the EU, Ukraine, Russia and Canada in 2013-2017, Millions of dollars

| Country        | 2013          | 2014          | 2015          | 2016          | 2017          |
|----------------|---------------|---------------|---------------|---------------|---------------|
| Canada         | 2,293.53      | 2,082.73      | 1,736.45      | 1,706.73      | 1,635.51      |
| EU countries   | 15,287.96     | 14,317.49     | 12,171.31     | 10,681.66     | 10,579.98     |
| Russia         | 3,639.55      | 2,026.56      | 1,612.55      | 1,192.49      | 1,359.15      |
| <b>Ukraine</b> | <b>657.16</b> | <b>293.35</b> | <b>114.87</b> | <b>109.63</b> | <b>138.81</b> |

*Compiled by the author based on sources*

A significant reduction in costs (almost 5 times) in supporting the development of the agrarian infrastructure is noticeable in Ukraine. Although the reduction of these costs is the general trend of the countries studied.

### **Conclusions**

Describing the general situation of supporting the development of the agri-food sector, it should be noted that Ukraine is lagging behind all countries in all positions. All actions of the Government of Ukraine regarding compliance with EU requirements do not contribute to improving the competitiveness of the country.

The main disadvantages of the Ukrainian agrarian policy are the unsystematic nature and the lack of stability. This is precisely what prevents the state from achieving the desired effect in supporting the industry. The above data confirms the conclusion about the inefficiency of state support for manufacturers. Even in years when it acquires a positive value, this happens at the expense of consumers. At the same time, consumers are taxed to a greater extent than manufacturers support. This suggests the existence of social losses. Since one of the limiting factors for the growth of the agricultural sector is a low effective demand for the products of the industry, government policy should be implemented in such a way as not to negatively affect consumer capabilities and not lead to an increase in demand restriction.

In the long run, the level of support for Ukrainian producers varied, mainly reflecting fluctuations in market price support. On average, producer prices are below the level of world

prices, but the imbalances in price protection for various groups of goods are significant. About 70% of the total support of manufacturers support is provided in the forms that most distort trade and production. Budget support is dominated by subsidies for the use of means of production.

The greatest influence on the total amount of support to manufacturers provides support to market prices. Thus, the difficult situation in supporting agrarians in Ukraine is connected not so much with the volume and structure of direct budget support and tax benefits, as with the inability of the state to provide support for market prices.

Regulatory measures should be aimed at solving the problem of supporting the market balance between supply and demand. In reality, they were aimed at solving temporary problems.

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**DEFINITION OF THE BUSINESS CORPORATE SOCIAL RESPONSIBILITY  
CONCEPT IN THE CONTEXT OF ECONOMY DIGITALIZATION**

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**Abstract.**

The article is devoted to examining the main stages of business social standards development and the evolutionary path that led to the formation of the concept of "entrepreneurship social sustainable development digital space ". Based on the study of trends inherent in modern society, it is determined what characteristics the company's business model should bear in order to obtain key advantages of market context specificity.

It is defined the requirements predetermined by the information society IT technologies. Based on the research of the consulting company "Cartner" and business development trends changed

by the Covid-19 pandemic and respective quarantine conditions, proven is that global trends in business environment changed are increasingly gravitating towards digitalization and the new digital business models creation. Therefore it is proposed to define a new paradigm for the corporate social responsibility development in the context of digitalization. Also on the new paradigm basis key elements have been identified that will allow us to form new CSR CIS standards.

**Key words:** CSR evolution, CSR trends, business digitalization, costs of digitalization, Ukrainian CSR model, small businesses, digital space for sustainable development

## INTRODUCTION

These recent years the business social responsibility become increasingly widespread. Developed countries shape society's perception of business not only in terms of its profitability, but also in terms of price and consequences of making a profit. That is, the economic entities functioning market mechanism includes social and environmental functions, which is actually reflected in the market value of the company.

In modern conditions, new business models are defined those models inherently including new requirements appeared for the formation of relationships with consumers, partners, workers, stakeholders, and society. Just the new standards of relationships are becoming one of the priority areas for competitiveness development and such standards at the present stage include standards of Corporate Social Responsibility. The development of social responsibility degree is determined through competitive advantages, namely, through the definition of environmental phenomena, and the determination of the internal environment processes quality in the organization, which undoubtedly affects the change in competitiveness. This study relevance, concerning the formation of a socially responsible approach of enterprises is enhanced by the fact that the small and medium-sized businesses management passed the necessary stages in its historical development, that led to the awareness not only in respect of social responsibility philosophy importance but also the importance of defining new approaches and standards in the context of digital society and the digital economy development

This study objective is to identify the possibilities and regularities of the corporate social



responsibility concept formation in new conditions of global regularities formation.

## 1. METHODOLOGY OF RESEARCH

Since the second half of the XX century, the Corporate Social Responsibility philosophy has been the subject of numerous researches by many scientists. The basis of modern concepts of business social responsibility is laid by the works of such authors as: G. Bowen, K. Davis, M. Friedman, A. Carrol, E. Freeman, who in turn rely on the classical ideas of social justice put forward by J. Locke, A. Smith, M. Weber, F. Knight, T. Parsons, and others [1,2,4,5,10]. Today, CSR researches evolved into a separate interdisciplinary scientific direction, in which foreign authors consider such issues as: sustainable development (J. Elkington, N. Finchtain. and others), business ethics (A. Crane, D. Mattitain.), corporate governance (F. Kotler, J. K. Rowe, A. Locket et al.), interaction with stakeholders (M. S. Branco, L. L. Rodriguez, S. Sachs et al.), the influence of international institutions and standards (S. Prakash, G. Kell, B. Slobtain.), problems of legislation (L. Luin, M. Sigert et al.).

Modern Ukrainian scientists Duboika A. Yu., Voitko S. V., Panukhnik A.V. pay attention to scientific researches on entrepreneurship social responsibility in the framework of sustainable development concept. Researches on the formation of corporate social responsibility standards in the new digital economy format received almost no attention, so they are still these of disparate non-systematic nature.

Corporate information systems gradually become widespread in many enterprises; their development, implementation and use in various directions were considered by: A. Yu. Dubivk, R. M. Litnarovich [8], L. A. Pavlenko, and others. However, research on the Corporate Social Responsibility indicators development as part of their integration in separate CIS modules or the development of a separate IT application for small businesses has hardly been conducted in the scientific literature.

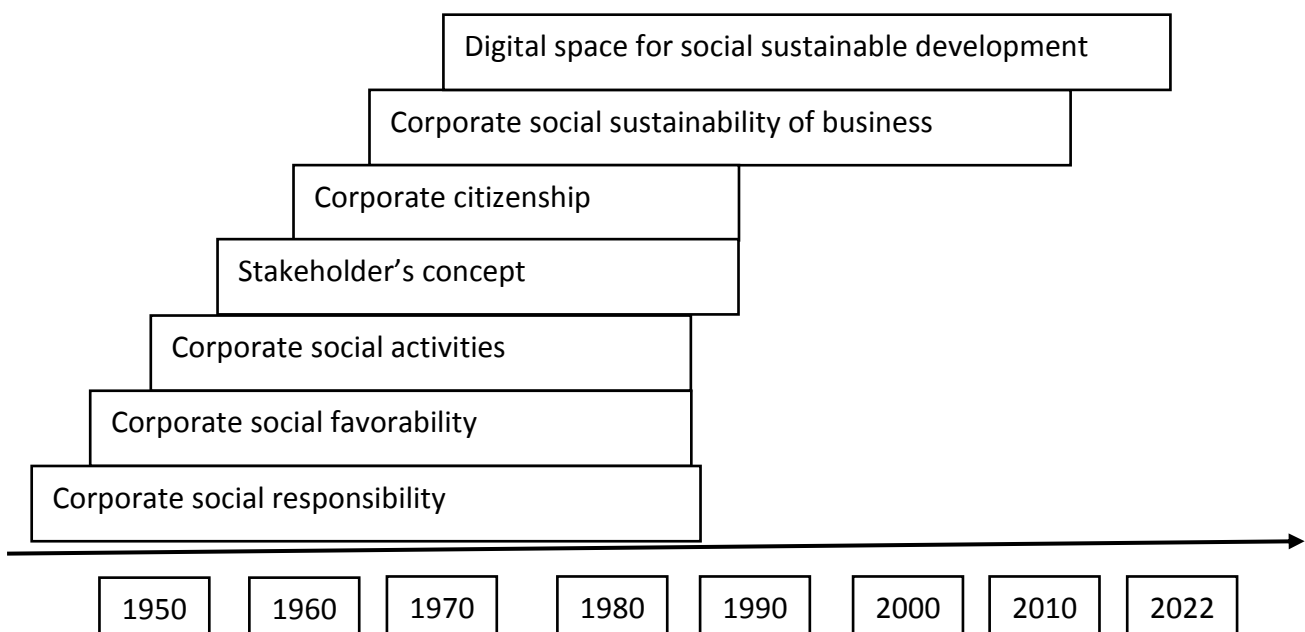
Currently, scientists and practical specialists pay attention to the variety of CSR manifestation forms. This approach to corporate activities is explained by the presence of various concepts, which positioning is identified with the CSR philosophy.

Let's list the most common ones, depending on the awareness of the the impact content and

nature as to the external and internal environment.

Figure 1 shows the periods and sequence of emergence of concepts that will help to reveal the CSR essence from different angles.

As confirmed by the conducted research, these concepts have consistently developed. They did not replace each other, but these more recent accumulated the experience of previous achievements, and gradually transformed. Individual concepts are still being constantly developed as a separate area of social responsibility.



**Fig. 1: Evolution of concepts that bring closer to the "socially sustainable development digital space" formation (compiled by the author on the basis of [4, 5])**

These concepts essence gradually changes in time and space, which indicates their dynamism and the ability to complement and develop each other indicates their vitality. Thus, the logical conclusion of CSR research should be the creation of a new integrated CSR model, which includes both previously formed concepts as components that complement each other.

Let's consider the current trends occurring in modern society and most influencing the development of consciousness in society, economic models of behavior and standards of entrepreneurship corporate social responsibility:

- The entrepreneurship social functions are increasingly beginning to determine the economic function (making a profit);

- Trade unions are gaining more and more influence on civil society;
- Along with national labor legislation, the international non-governmental organizations and other social responsibility standards are becoming widespread;

The rapid development of new technological tools, software products, electronic and communication networks determines the need to analyze the current state of business informatization and determine its further opportunities and development trends in the information and communication technologies introduction and use of in the activities of enterprises context. The realities of modern business determine that the information technologies development directly affects the growth of enterprises business indicators. Therefore, it is indisputable that timely introduction of information technologies and identification of the most adaptive ones for use in the business model opens up a wide range of competitive opportunities.

In the context of transition from an industrial to an information society, the information technologies must meet the following requirements:

- Ensuring the implementation of document management and information processing according to the criteria of their effectiveness;
- Inclusion of a complete set of information processing units as well as hardware and software tools for supporting information technology processes;
- Compliance with the organizational structure that should ensure planning and rationing of information processing processes;
- Application of methods for implementation and control over the document flow process;
- Compliance with the procedure for mastering and implementing information technologies, as well as using them as a basis for adapting automation tools;
- The presence of obvious advantages in comparison with existing technologies for the introduction of advanced information technologies [4, p. 39].

In the next five years, according to the consulting company "Cartner" [11], it is expected a spread of voice interfaces, the Internet of Things (IoT) and chatbots, democratization of artificial intelligence (AI), as well as the appearance of a record amount of false information and rethinking the format of large technology corporations activities.

According to prognostic estimates, by 2022, the most advanced retail enterprises will start implementing a virtual and voice product search service. This, in turn, will require the company to better understand the wishes of consumers, their interests and intentions. According to the forecasts of the consulting company "Cartner" analysts, as a result of the innovations introduction, the revenue from e-commerce platforms may grow by 30%, and at the same time the coefficient of attracting new customers, the level of customer satisfaction and market share will increase" [1].

Attention should be paid to the consideration of modern transformations in large technology corporations. Well-known technology giants have already started organizational and economic structural changes. Such companies that have announced their will to formatting and relevant intentions include: the American corporations "Facebook", "Apple", "Amazon" and "Coogle" as well as the Chinese "Alibaba", "Baidu" and "Tencent". This is due to the fact that these companies influence will become so significant that shall render more and more problematic to develop new profit-making scenarios. In order to stay ahead of potential competitors, corporations will have to "undermine" their own markets, change the rules taking into account all the relevant risks [11].

Analysts noted that in 2019, contrary to initial forecasts, global-scale expenses for IT increased by only 0.4%. But in 2020, as can be seen from the table, spending on information technology increased by 3.7%. However, growth will be very uneven - some items of expenditure will increase at a double-digit pace, while others will decrease [10]. Table 1 shows the forecast of costs that will be invested in IT technologies and digitalization development in 2021 according to the analytical conclusions of the company "Cartner" [11].

**Table 1. Digitalization expenditures in 2019-2021 on a global scale**

| Category                       | Expenses 2019 (USD billion) | Dynamics of changes 2019 (%) | Expenses 2020 (USD billion) | Dynamics of changes 2019 (%) | Expenses 2021 (forecast) (USD billion) | Dynamics of changes in 2021 (forecast) (%) |
|--------------------------------|-----------------------------|------------------------------|-----------------------------|------------------------------|--|--|
| Data centers                   | 205                         | -2.5                         | 210                         | 2.6                          | 212                                    | 1  |
| Industry-specific IT solutions | 457                         | 8.8                          | 507                         | 10.9                         | 560                                    | 10.5                                       |
| Devices and periphery          | 657                         | -5.3                         | 683                         | 1.2                          | 685                                    | 0.4  |
| IT services                    | 1,031                       | 3.7                          | 1,088                       | 5.5                          | 1,147                                  | 5.5  |
| Telecommunications services    | 1,364                       | -1.1                         | 1,384                       | 1.5                          | 1,413                                  | 2.1  |
| Total                          | 3,732                       | 0.4                          | 3,872                       | 3.7                          | 4,018                                  | 3.8  |

(Source : [https://www.cnews.ru/reviews/ittrendy2020/articles/prognoz\\_sleduyushchij\\_god\\_budet\\_luchshe](https://www.cnews.ru/reviews/ittrendy2020/articles/prognoz_sleduyushchij_god_budet_luchshe))

And the introduction of new technologies requires adopt a whole range of measures aimed at modernizing (reengineering) or engineering the business model of the entire enterprise, or forming a new strategy and philosophy of doing business, or introducing a new information system at the enterprise [1]. All this requires a lot of economic, financial, human and time resources. Therefore, issues related to the use of information technologies in enterprises of various business areas have become so widely popular. Over the past 40 years, in the field of economics, cybernetics, computer science and computer technology, political science and cultural studies, the possible aspects of forming and implementing new forms and models of corporate information systems that can identify and take into account new social responsibility standards and new challenges that digital society puts forward have been considered. In particular, here we can mention studies devoted to the problems of improving the enterprises information infrastructure in various industries, represented in the works of such scientists as: D. V. Karpov, I. A. Yavorska., M. V. Talan, N. B. Safonova, O. A. Martynyuk, T. V. Yanchuk, P. J. Dougherty, R. J. Richie, and many others.

Research on the design of the enterprise architecture, the formation of the methodology for its construction and support was conducted by such scientists as Zachman J.A., Sowa J.F., Minoli D., Schekkerman Ja., Zindera E. Z. Research on practical aspects of system architecture engineering was conducted under the auspices of such organizations as the Open Group, DoDAF, Institute for Enterprise Architecture Developments, etc.

As a result, a fairly large amount of developments has been formed. At the same time, the dynamics of integration processes is changing so rapidly that it requires updating theoretical research and practical recommendations on the organization of an IT management system for the enterprise's business architecture to solve a wide range of socio-economic tasks of the enterprise at the present stage.

## **2. RESULTS AND DISCUSSION**

Recently, society faced the problem of more efficient and safe development of humanity, preservation of the environment, social protection of workers, industry greening, and most importantly informatization, as one of the main impulses for the development of progress and

society. These issues that have been discussed in detail at the summit in Rio de Janeiro do determine the main postulates of the sustainable development concept. The search for opportunities and methods of transmitting information about the sustainable development fundamentals in the most effective way is now one of the top priorities for the development of socio-ethical business and the global economy. In our opinion, such method can consist in the introduction of additional modules in existing corporate information systems or the development of separate IT applications that can provide such functions.

Among the key features of the Ukrainian CSR model that need to be taken into account when developing such IT tools, we can distinguish [1, 2, 3, 7]:

- Lack of both the socially responsible entrepreneurship ideology and a high level civic consciousness in Ukraine;
- Forced nature of business social responsibility in Ukraine. For some entrepreneurs, CSR is a response to the request of the authorities, and some even consider it a form of state racketeering. By the way, this is indirectly confirmed by a small number of companies that have joined the UN Global Compact in Ukraine;
- Lack of transparent procedures for developing social policy both at the state and regional levels, as well as at the enterprise level. Dependence of the companies' social activity forms and methods on personal preferences and interests of managers and owners. This is due among other things to the increased role of managers in the post privatisation period;
- High variability of social activity forms existing at individual enterprises and companies, including through their own balance between economic efficiency and social necessity;
- High differentiation of social corporate benefits, which, especially recently, are aimed at top-level managers and to some extent at highly qualified personnel;
- A significant gap between society and business in understanding the social responsibility priorities.

The solution to these problems can be found through the introduction of tax incentives for socially responsible companies. This will provide them with financial resources and create boundaries of mutual understanding between society, government and business.

The practice of business social responsibility became a trending phenomenon for Ukrainian enterprises. Most top managers know about BSR, but not all of them implement it. Today, the key

companies in Ukraine that operate corporate responsibility standards are leading multinational corporations and domestic companies that are leaders in the formation of CSR trends in the Ukrainian business environment. These are, in particular, TNK-BP Ukraine, Siemens Ukraine, Nissan Motor Ukraine, Tetra Pak Ukraine, Coca-Cola Beveridge's Ukraine, Vitmark Ukraine, Ernst & Young, Hyundai Motor Ukraine, etc. [1, 11].

The development of entrepreneurship in modern difficult socio-economic conditions significantly affects the stabilization and recovery of the national economy. The level of domestic enterprises efficiency determines the possibility of economic growth of the state, the employment level and the population life quality. In order to identify certain trends and describe in detail the state of domestic entrepreneurship development, we will analyze the dynamics of the number of business entities and the share of large, medium, small and micro-enterprises in the total number of business entities in Ukraine during 2015-2019 (table. 2).

**Table 2. Dynamics of changes in large, medium, small enterprises and microenterprises in the total number of business entities in Ukraine during 2015-2019**

| Years   | 2015      | 2016      | 2017      | 2018      | 2019      |
|---|-----------|-----------|-----------|-----------|-----------|
| Economic activity subjects by size                      |           |           |           |           |           |
| Large business entities                                 | 497       | 423       | 383       | 399       | 280       |
| Medium-sized businesses                                 | 16,618    | 15,510    | 15,113    | 15,254    | 14,278    |
| Small businesses  | 1,915,046 | 19,15,046 | 1,850,034 | 1,789,406 | 1,723,322 |
| Micro-business entities(incl. individual entrepreneurs) | 1,637,180 | 1,859,887 | 1,910,830 | 1,800,736 | 1,737,082 |

(Compiled based on [6])

Analysis of the business entities structure shows that the largest share falls on small businesses and microenterprises; this allows us to assume that these segments need the greatest assistance in developing methods and technologies for implementing social responsibility standards.

Based on the above, we can determine that the business social responsibility is a voluntary activity of enterprises aimed at observing high standards of economic activity, social standards and quality of work with personnel, minimizing the harmful impact on the environment in order to equalize existing economic and social imbalances; creating partnership relations between business, society and the state; improving business performance in the long term [1].

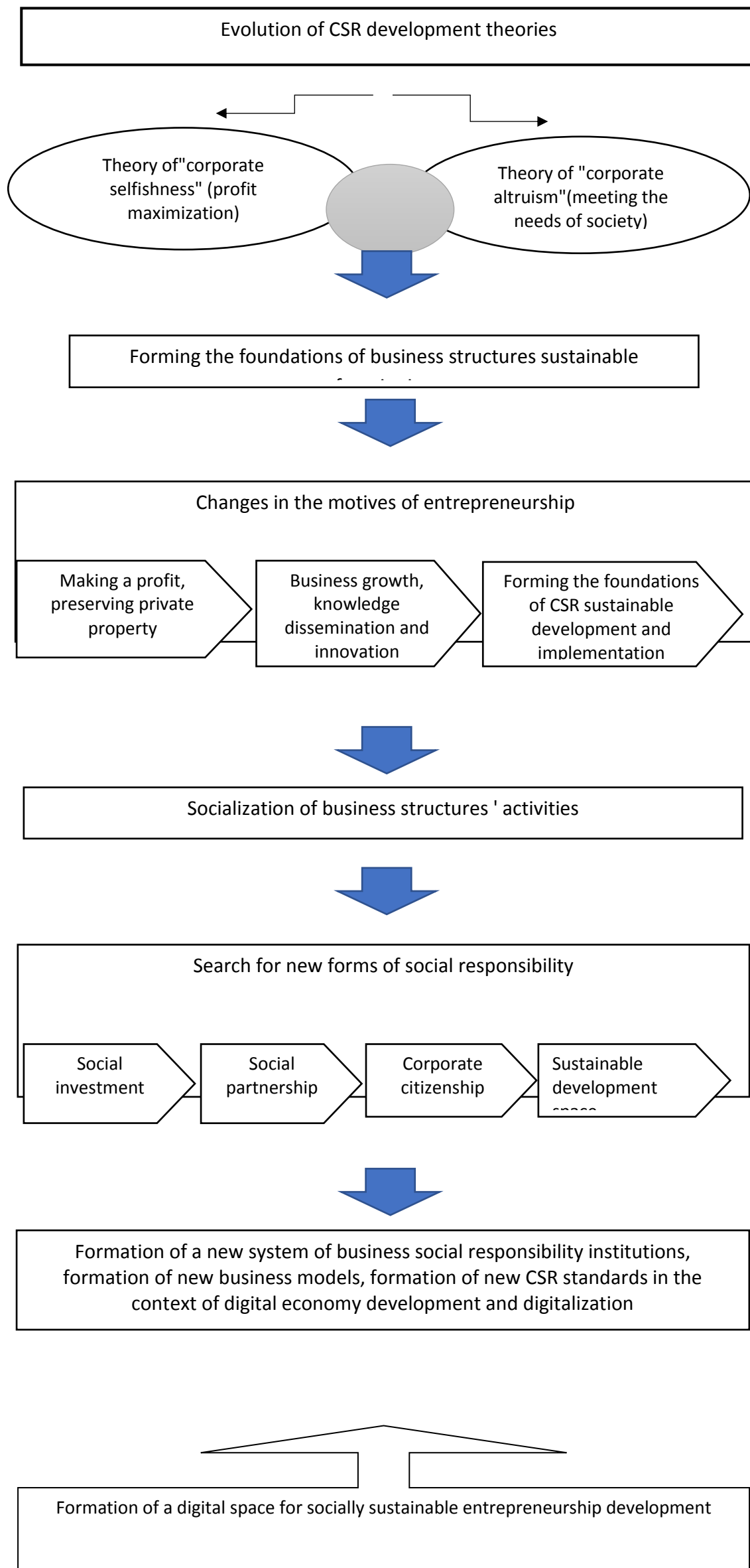
As for the implementation of CSR principles in information systems, in our opinion, all manifestations of social responsibility can be grouped into two groups (CSR implementation internal form and CSR implementation external form) in terms of influencing internal and external stakeholders. The CSR internal form is expressed through the formation of a socially responsible company policy in relation to staff and owners. Programs implemented within its framework will be related to improving health standards, creating safe working conditions, developing staff, solving issues of social restructuring, as well as improving the efficiency of doing business.

Summarizing the above material, we can conclude that currently the social activity of enterprises goes beyond "charity", becomes part of business activity and is carried out by joint efforts of all divisions of companies. Social investment represents a core around which the image and reputation of modern business is formed. Expanding the scope of companies responsibility is just as inevitable as expanding the company's scope of influence on the environment. On the one hand, business operates under pressure from the state and society, and on the other hand, it is gaining an increasingly real opportunity to actively influence the socio - economic environment for its own purposes.

So, we can talk about the formation of a new paradigm of Corporate Social Responsibility (fig. 2.).

**Fig. 2. Definition of a new paradigm for CSR development in digitalization context (compiled by the author)**





The key elements of the new paradigm are:

1. Social investment, which expands the scope of corporate social responsibility and contributes to solving current national problems in the field of employment, education, housing, security, environmental protection, fighting poverty, etc., through the transition from traditional charity to long-term focused social investments, both at the level of the country as a whole and at the level of its individual regions.

2. Social partnership that provides a constructive dialogue between the government, business and the population, that results in redistribution between government and business structures of the responsibility spheres for solving socially significant problems.

3. Corporate citizenship, which provides for mutual responsibility of business and government structures in civil society, as well as interests coordination between the company and its main stakeholders not only in the economic, but also in social, environmental, political and other spheres.

4. Informatization of most business processes at business structures is coordinated remotely via internet technologies and cloud services.

5. Due to the deteriorating business conditions associated with the Covid-19 pandemic, business structures, social institutions, the government and society as a whole had to radically change the existing lifestyle, doing business and even communication, where the main mechanisms were virtual technologies, IT applications, mobile and other digital tools.

Thus, we can speak about the emergence of social interaction new paradigm, building new business rules and business strategies, where a new era of digitalization will play a key role.

## **CONCLUSIONS**

Based on the study results, the following conclusions are evidently drawn.

Since there is no single approach to determining corporate social responsibility in the scientific literature, we should speak about the possibility of developing a definition depending on the direction of research.

The transformation of business social ethics and social responsibility standards progressed along with the development of entrepreneurship, business models and challenges of society and the economy, which changed and acquired new properties.

At the present stage, the formation and implementation of individual elements or philosophy of social responsibility are not only requirements of society, it is defined as a key factor in the competitiveness of the company.

Current trends in the development of informatization and digitalization indicate the rapid development of mobile applications, voice interfaces, the Internet of things and chatbots, artificial intelligence introduction in various areas, this will change the business space and requires changes in business models and business rules. Such conclusions are also confirmed by the presented statistics on digitalization costs in 2019-2021 on a global scale with forecast indicators for 2021.

To determine the situation of social responsibility standards implementation in Ukraine, a study of business entities segment structure was conducted, and it was determined that the largest share of enterprising subjects falls on small businesses and microenterprises, which allows us to determine the sector that most requires attention in the sphere of social partnership and social responsibility development.

Today, the key companies in Ukraine that have implemented corporate responsibility standards are leading multinational corporations and large domestic companies that form new CSR trends in the Ukrainian business environment. They have both resources and capabilities to implement drastic changes in their business structures, unlike small, medium and micro businesses which cannot afford drastic organizational and information transformations, so they should be the center focus needing to develop and create universal and adaptive business models with CSR standards based on new IT tools in the context of global digitalization.

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**INTRODUCTION OF CONTROLLING  
IN THE HEALTH CARE MANAGEMENT SYSTEM**

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**Abstract.**

Controlling is one of the strategic tool, which can be effectively used in the health care. The author defined the main tasks of controlling in the health care management system. In the article the information-analytical support is proposed, which is characterized by a set of basic tools that allow monitoring, diagnosis, evaluation, algorithmization, GAP-analysis, SWOT-analysis and build the McKinsey-GE Matrix.

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

The introduction of controlling in the health care management system should also take into account the methods of proactive management, delegation of structural and functional units of authority to make decisions independently, awareness of personal responsibility for decisions made or not that affect the functioning and development of health care.

Therefore, the implementation of the philosophy of controlling in the management system of health care should take into account the application and observance of certain principles:

- Defined status and its place in the health care management system;
- Segment system;

- Consistency of competencies;
- Independence;
- Limited action;
- Caution and full coverage of the identified factors;
- Support of the system of any level due to coordination, unification of methodology, feedback channels, etc;
- Flexibility, etc.

The main task of controlling in the health care management system is information and analytical support for new methods, mechanisms or algorithms that will ensure the achievement of certain intra-industry goals. In the context of reforming the medical sphere of the country and under the influence of global factors, the main purpose of controlling in the management system of health care is to provide information and analytical support for management decisions at any level with operational, tactical and strategic features.

The main tasks of controlling in the health care management system are defined in Fig. 1.

| TASKS OF CONTROLLING IN THE HEALTHCARE MANAGEMENT SYSTEM |  |
|--|--|
|  | Information and analytical support of health care entities   |
|  | Monitoring of the state of the medical sphere in the country   |
|  | Research of the implementation of planned programs related to health care, identify the causes         |
|  | Ensuring organizational and methodological functions in intra-industry control                         |
|  | Diagnostics of the state of the medical sphere in the country  |
|  | Methodological support of the evaluation system of intra-industry management                           |
|  | Formation of operational, tactical and strategic guidelines  |
|  | Formation of the database of results of controlling the intra-branch environment of the medical sphere |
|  | Economic and mathematical modeling of health care development  |
|  | Formation of proposals for improving the strategy of development of the medical sphere of the country  |

Fig. 1. The task of controlling in the management system of health care

To achieve a positive result of the introduction of controlling in the management system of health care, we consider it necessary to conduct it progressively according to a certain algorithm that takes into account current trends in the medical field and strategic guidelines.

The fundamental reason for the protracted systemic crisis in the medical sphere of the country should be considered the lack of scientifically sound strategy and tactics for managing transformational socio-economic processes, their effective regulation in order to perform operational and tactical tasks and achieve qualitatively new indicators of future health development.



Therefore, controlling in the health care management system should use synthesized or hybrid techniques, methods and algorithms that will ensure the solution of strategic tasks related to the functioning and development of medical services in the country on a new qualitative basis.

The special attention of controlling in the health care management system is focused on information-analytical support, which is visualized in Fig. 2, and includes the relevant interconnected components:

- Information on controlling subjects;
- Information about controlling objects;
- Purpose and tasks of controlling;
- Information on the factors influencing the medical sphere;
- Information on indicators of the medical sphere;
- Information on the results provided by the medical field.

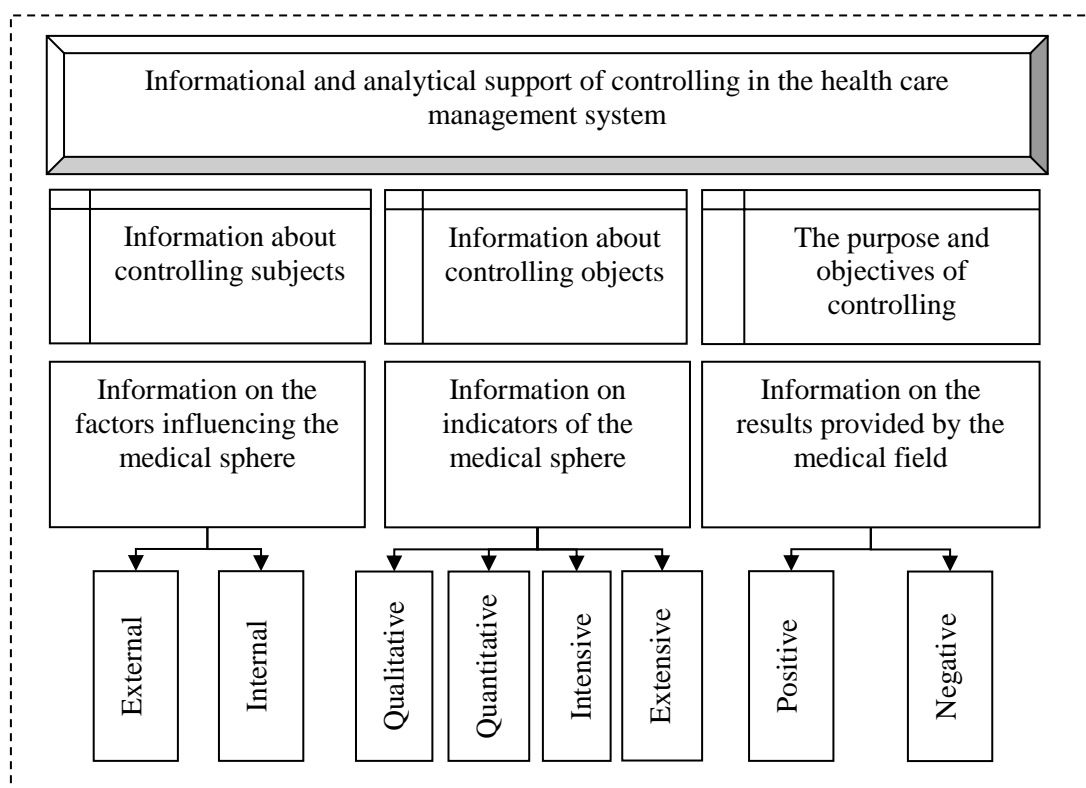


Fig. 2. Information and analytical support of controlling in the health care management system

The process of modernization of the methodological basis of controlling in the health care

management system is carried out in a single key and implemented in all segments of the medical field, which is possible due to and based on a system-oriented approach that provides compositional and dynamic procedures in controlling.

Thus, the increase of efficiency in the management system of the health care sector partly depends on the level of instrumental-methodical, information-analytical and technical-technological support of intra-industry controlling.

The methodological basis of controlling in the health care management system requires a systematic approach with the definition of:

- Transparent basis;
- Organizational and structural aspects;
- Complex of functions;
- Modern tools that provide an opportunity to significantly increase the level of indicators that characterize the functioning and development of the health sector.

It should be noted that controlling fully enables the increase of efficiency and rationality of activity in the management system of the health care sector, thanks to its consistent methods of accounting process; monitoring; assessment and diagnosis; careful control and proportional planning and taking into account the factors of endogenous and exogenous impact on the intra-industry environment.

Let's agree with controlling researchers Professor O. Poberezhets and Associate Professor L. Masina that on the one hand, the main function of controlling should be considered only the creation of organizational capacity to obtain the necessary information management to develop and make appropriate management decisions, but this approach significantly limits the potential properties of controlling, which is not inherent and contradicts modern management technologies.

It should also be noted that controlling in the health care management system should take into account the multifunctional aspects that are revealed through instrumental support, take into account the basic levers and new trends that occur in the intra-industry environment.

The construction and operation of controlling in the health care management system has the

following directions:

- Creation of an organizational structure of controlling, which takes into account the peculiarities of the medical sphere;
- Functional-essential approach to the elements of controlling;
- Providing controlling tools, methods, mechanisms and algorithms that meet the goals, objectives and current trends of the strategic management of the intra-industry environment;
- Compliance with the synergistic effect in the interaction of controlling components;
- Proportional distribution of responsibilities between the subjects of intra-industry controlling and taking into account professional competencies and socio-economic priorities of the medical sphere;
- Development of intra-industry human capital and the influence of relevant factors on it.

The information-analytical function of controlling in the health care management system is characterized by a set of basic tools that allow monitoring, diagnosis, evaluation, algorithmization, GAP-analysis, SWOT-analysis and build the McKinsey-GE Matrix, which allow the process of detection and systematization the necessary analytical and synthetic information with its subsequent substantiation in order to assess the results of the functioning of the medical field and determine strategic aspects.

The process of adapting the tools must take into account the specifics of controlling the medical field, resource provision and vector orientation of health care reform. 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.

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## EVENTS AS DRIVERS OF TOURIST DEVELOPMENT OF THE REGION

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### **Abstract.**

The article examines the process of influence of tourism development on raising the economic level of the regions of Ukraine and the state as a whole, tourism is one of such budget-forming factors. It is established that the features of event tourism are: lack of seasonality; possibility of forecasting; mass; interactivity; innovation; regularity of events; encouraging re-visits to destinations; entertainment. The number of tourists traveling for the purpose of the organization of leisure across Ukraine and the Nikolaev area accordingly is investigated.

**Key words:** tourism, tourist potential, gastronomic festivals, destinations.

## **INTRODUCTION**

The tourist image of a particular region and the state in general should be given considerable attention to the organization of event tourism. The main motivation for the trip is to attend a certain event. The peculiarity of this type of tourism is the uniqueness of each trip, unforgettable impressions and the atmosphere of the holiday, it stimulates the development of the region's infrastructure and income from tourism, so the region benefits from a certain event. Event tourism often involves a certain cognitive component, the involvement of tourists in local culture. It can be classified by event type and scale. For the effective development of the regions it is necessary to create attractive events. This is justified by the fact that the development of this type of recreation, in the first place, makes it possible to synchronize the tourist flow during the year. This approach allows you to continuously expand the audience of visitors, as well as not to lose the existing one. Scientifically substantiated approaches to the formation of decisions on the conduct of various events increase the quality of the event and create conditions for ensuring the flow of tourists during its implementation.

## **LITERATURE REVIEW**

The following foreign and domestic scientists deal with the development of event gastronomic tourism: Ageenko O., Antonenko V., Babkin O., Basyuk D., Beidyk O., Kuklina T., Rasulova A., Salamatina S., Stelmakh O., Kaurova A., Kovalenko K., Matveev V., Tishchenko P., Shikina O.

School I. considers gastronomic tourism as a type of hobby tourism, T. Sokol and Z. Canonist as thematic tourism, V. Fedorchenko - as specialized tourism. V. Antonenko and D. Basyuk emphasize in their works the importance of the development of this type of tourism in some regions of Ukraine. In domestic science, V.Gordin, D. Gusenova, A. Karabaeva, A. Lukyanchenko, Y. Trabskaya, and E. Chernova study the interaction between the tourism sector and gastronomy. The authors study the forms and manifestations of gastronomic tourism as a means of increasing the attractiveness of the destination, as well as the study of ways to form and promote gastronomic brands of the destination.

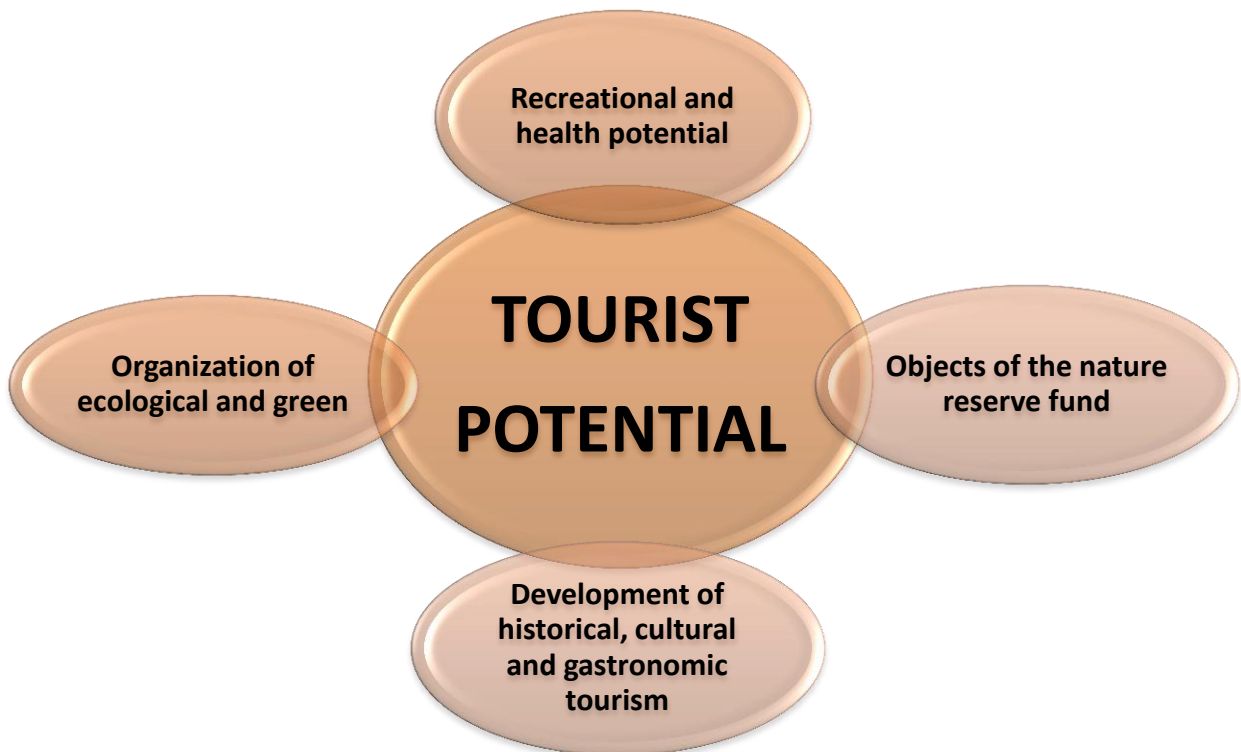
## **MATERIALS AND METHODS**

The purpose of the article is: research of theoretical aspects of event tourism development of

the region, analysis of the current state of gastronomic tourism in Ukraine and Mykolayiv region, identification of prospects and ways of development of regional event gastronomic tourism. The methodological and informational basis of the work is the scientific works of domestic and foreign scientists on the development of event tourism, statistical data of the State Statistics Service of Ukraine. The realization of the defined purpose is based on a systematic approach to the researched problems and various general scientific and special research methods are used.

## **RESULTS OF RESEARCH**

Event resources cover the most significant manifestations of modern social life with its fashion for globalization, ecology, active and healthy lifestyle, beliefs and ideas about the style and stereotype of human behavior in society, including its promotion and implementation mechanisms [1]. The development of event tourism is based on event resources [Lyubitseva, 2014]. They are among the dynamic factors in the formation of tourist flows, as they include the motivational prerequisites for traveling to the place where the event or phenomenon occurs. Awareness of the economic and cultural potential of festivals for the development of the region and the city, the definition of festivals as a tourist asset is an important element in creating a strategy for tourism development in Ukraine. Such a strategy should be formulated combining the experience of different sectors with the awareness that tourism is both a sector of the economy and a resource for sustainable cultural development. At the community level, festivals are understood as a tourist resource. However, in addition to understanding and community readiness to organize festivals, it is necessary to measure the impact of festivals on the development of tourism in the regions and identify specific indicators for the formation of tourism development strategy in the region, including the strategy of the event.[2] The tourist potential of Mykolayiv region is formed by many components (Fig. 1.), but the formation of its tourist image must be paid attention to the organization of event tourism. The peculiarity of this type of tourism is the uniqueness of each trip, unforgettable impressions and the atmosphere of the holiday. Features of event tourism are: lack of seasonality; possibility of forecasting; mass; interactivity; innovation; regularity of events; encouraging re-visits to destinations; entertainment.



**Fig.1 Tourist potential of Mykolaiv region**

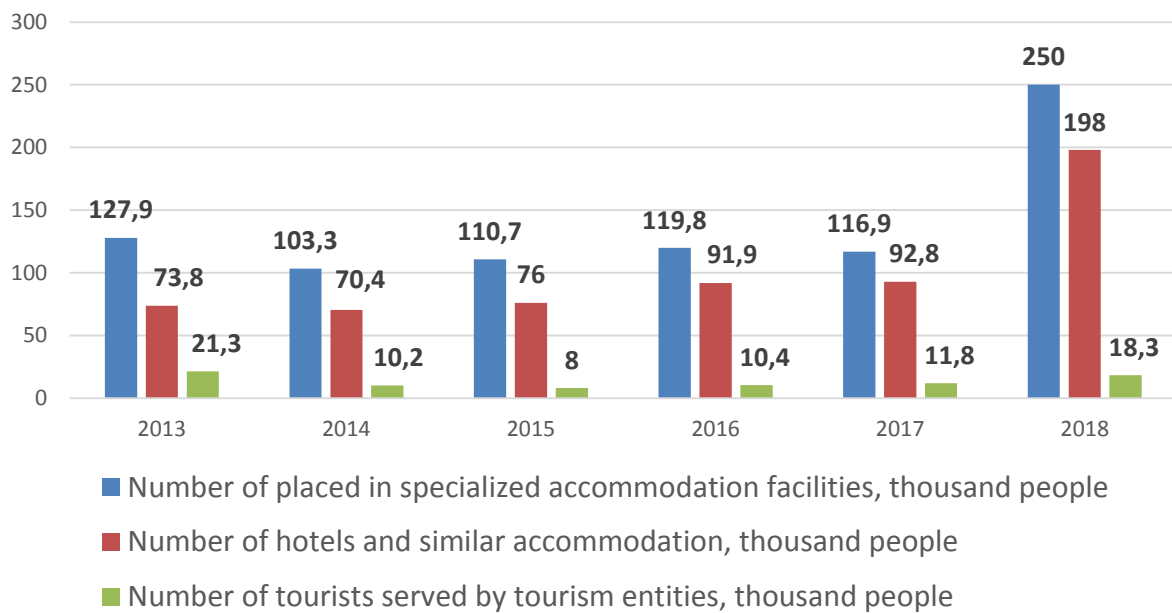
Source: developed based on [8]

According to the State Statistics Service of Ukraine (Fig. 2), for the last year of research 82% of the total number of tourists traveled for leisure, in the Nikolaev area this indicator reached 29%. As for domestic tourists, the distribution is 45% and 33%, respectively [8]. Thus, given the large share of tourist trips for recreation and entertainment (for Ukraine - 82%), it is advisable when planning a strategy for tourism development in the region to pay attention to the development of event tourism.

Tourism events by scale have a regional, national and international level. Among the events that gather tourists, the most popular are: music concerts, sports competitions, festivals, national holidays [Beidyk, 2014].

The holding of events stimulates the development of the region's infrastructure and income from tourism, the region benefits from a certain event. Event tourism involves a cognitive component, the involvement of tourists in local culture.





**Fig.2 Number of tourists having a rest in the Nikolaev area**

Source: developed based on [3]

Gastronomic festivals and competitions have the potential for the development of event tourism in Mykolayiv region. Currently, this type of event tourism, given the centuries-old history and preservation of the traditions of the Ukrainian people, is quite young and promising both in Ukraine and in its regions [9].

Carrying out gastronomic events will attract an additional significant number of tourists and additional income to the regions [7]. In addition, a communication platform is being created for local authorities, businesses, city dwellers and festival organizers, where the problems of gastronomic tourism development may be raised.

Gastronomic tourism is an auxiliary tool in learning about the cultural heritage of countries and regions, as the dishes of national cuisine are one of the elements that reflect the way of life and traditions.

Ukrainian cuisine has been created for many centuries, so it to some extent reflects not only the historical development of the Ukrainian people, but also its customs, traditions and culture. Thus, Ukrainian cuisine can be a significant factor in stimulating tourist flows. Today there is a popularization and interest of the population in cooking: TV shows, culinary channels, master classes, culinary schools.

According to research, tourist flows are growing in those regions where specialized tourist products such as festivals, competitions and public holidays are formed. Gastronomic festivals, culinary competitions and holidays can be a factor in the growth of interest in gastronomic

tourism, and the direction of business for households, food producers, restaurants (HORECA). This will contribute to the development of national and regional economies.

Among gastronomic festivals and holidays we will single out festivals of national cuisine, street and city food; festivals dedicated to a particular dish. Gastronomic festivals, competitions and holidays can make a significant contribution to the formation of the tourist brand of cities (regions and countries). During gastronomic festivals, tourists taste dishes from local products, get acquainted with the features of regional cuisine, traditions, features of consumption.

Recently, the number of gastronomic festivals in Ukraine is growing rapidly. The main objects of gastronomic festivals of Ukraine are well-known culinary brands - dumplings, borscht, lard, donuts, beer and wine, chocolate and coffee, fish and seafood, which form the tourist image of the regions of Ukraine. Most gastronomic festivals in Ukraine are held in the Western and Central parts. More famous tourist and gastronomic attractions are Lviv, Uzhhorod, Mukachevo, Kyiv, Zhytomyr, Odessa and Poltava. Among the popular festivals are: "Red Wine", "Uzhgorod Palanchita", Craft Beer & Vinyl Music Festival "Craft Beer & Vinyl Music Festival", "Coffee to Lviv", "Kyiv Food and Wine Festival", Healthy Food Festival Best Food Fest ", Festival of sweets" SWEETs Fest ", " Kyiv Coffe Festival ", " Gastro City in Zhytomyr "and others.

The festival movement in Nikolayevshchina also acquires active development. In the plan of strategic development of Mykolayiv for 2016 - 2020, image events (festivals, competitions, contests, etc.) were approved in order to increase the tourist attractiveness of the city, increase tourist flows and overcome seasonal fluctuations.

In recent years, the number of gastronomic events held in the region is growing, among them: street food festival "Bryachina", street food festival "Nikfest", wine, oyster and classical music festival "Nikolaev gourmet", festival "Gastronomic Nikolaev", Christmas gastronomic street food festivals, culinary arts and service competitions [10].

The Association of Culinary Arts of Ukraine (ACU) makes a significant contribution to the development of the gastronomic movement and culinary activities in the Mykolayiv region. During 2018-2019, organized by the association in Mykolayiv, gastronomic festivals, competitions, master classes, gastronomic evenings with the invitation of foreign culinary meters were held.

There where a panel discussion took place between representatives of the restaurant business and the management of educational institutions that train students in the field of services together

with the Department of Education and Science of the Nikolaev regional state administration work on the project "Education. Profession. Career.", the first part of which was held in early 2019 as part of the forum "Employers' Platform". The close cooperation of the participants will comprehensively promote the development of professional skills of employees in the industry, intensive exchange of experience, increase the level of professional training, increase the prestige of the profession, and improve the level of service to guests of the city.

Within the framework of the festival "Nikolaev gastronomic" the open competition on culinary art and service "Best cook" in which representatives of more than 10 areas of Ukraine took part was carried out.

For the first time in the region there was an open competition for grilling "Barbecue Battle", which was attended by guests from Mykolayiv, Kherson, Kyiv, Zhytomyr, Lviv, restaurateurs, directors of HoReCa operators, private entrepreneurs, producers of food and related products, media representatives.

The purpose of gastronomic festivals and competitions of all-Ukrainian scale is to popularize and increase the tourist attractiveness of the region. The development of a culture of consumption of dishes made from local products, according to unique recipes will improve the quality of food and service level.

It is quite difficult to calculate all the income from event tourism. The analysis can be performed by the following methods: the first is the data of mobile operators to monitor the concentration of tourists during festivals; the second method is to obtain relevant data through the sale of excisable goods (on the territory of the event location), the third method is the data of registration of festival participants (for events held on the premises).

## **CONCLUSIONS**

So, managing the venue of the festival, you can develop the territory; managing the time of the festival, you can expand the season; managing the contingent of the festival, you can develop the economy.

The priority task of popularization of event tourism should be development of plans of carrying out of regional, all-Ukrainian and international tourist festivals that can attract to Nikolaevshchina tourists not only from other regions of Ukraine, but also foreigners. Holding such events will promote the region's brands and help attract investment.

Particular attention is paid to the influence of public organizations, namely the Association of Culinary Arts of Ukraine, whose active work in Ukraine and Mykolayiv region has increased the potential of event tourism by organizing numerous competitions, championships in culinary arts and service in gastronomic festivals.

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