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The System of Indicators for Indicative Management of a Region and its Clusters

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Abstract

The turbulence in the economic environment leads to a decrease in stability of functioning of clusters and the regional economic system as a whole. This requires the development of effective management mechanisms based on the indicative approach, the central concept of which is an indicator. Despite concerted efforts by scientists and governmental bodies, the universal system of indicators for the management of regional cluster development remains underdeveloped. The research is based on the principles of dialectical logic, system approach to the analysis of economic processes, analysis and synthesis of theoretical aspects and empirical experience.

Keywords: indicators; management; region; cluster.

1. Introduction

Current trends of cluster development of regions are constantly developing and becomes more complicated. Not only endogenous factors but also external ones influence on clusters of social, political, legal, ecological and other conditions. The turbulence growth of an economic environment leads to a decrease in stability of cluster functioning structures and a regional economic system in general. Therefore development of effective controlling mechanisms

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for counteraction to these negative tendencies is required. So, management in modern conditions emerges adaptive, anticipatory and strategic nature.

Objectively there is an increase of the state and government participation in the regulation of the economy and in the development management of the economic processes. Thus it requires review of public administration tools. And the special-purpose programs should be included in order to guarantee development goals on the basis of an indicative approach.

The analysis shows that up to date the development approaches to indicative management haven`t been worked out methodologically. Therefore that emphasizes a subject point to a greater extent.

Such famous scientists as Frisch (1992), Tinbergen (1964, 1981), Kovacs and Dallago (1990), Mitchell (1935) and others made a major contribution to the development of the planning theory. Besides they proved the reasons for its prerequisites under a free market economy. In Russia founders of the theory of planning are Kondratieff (1984), Bazarov (1964), Kantorovich (1939). After that, many other scientists studied the origin, the development and practical application of public administration using the special-purpose programs as well as an indicative approach (Rostow, 1994; Solow, 1956; Zhikharevich, 2012; Paskus and other, 2015; Vertakova and Plotnikov, 2013 and other). Many other scientists were engaged in the development and studying of the mechanisms of separate element usage when dealing with strategic managing system.

The conducted research is based on the principles of dialectic logic and system approach to the analysis of the economic phenomena and processes; the analysis and synthesis of theoretical provisions and empirical experience of indicative management implementation in different countries. To achieve new scientific knowledge we applied the scientific sophistication approaches which are proved and widely used in modern scientific investigations: selection, distribution, comparison, generalization, forecasting, regression and correlation analysis, graphical description and performance analysis etc.

2. Indicative approach application in public administration

Meeting the challenges of a sustainable development requires that the public authorities carry out a reasonable, rational and effective long-term management activity aimed at an adaptive overcoming of the arising difficulties and the operational adaptation of governance to the changing situation. In this regard, traditional methods of forecasting, planning, managing and monitoring of the economy functioning are being relegated into the background, giving way to the new more productive management methods, such as special-purpose programs and project management on the basis of indicative approach.

Many countries are actively trying to implement an indicative management into management practice. These tools adapted for market conditions are performed by the indicative (from French "indicatif" – index) methods, supported by the creation of economic conditions in order that   the organizations could adopt these governmental recommendations   within the planning period.

Such type of planning has gained considerable development in a number of countries (France, Great Britain, Germany, China, Japan, Canada and the USA) and proved the efficiency as one of the instruments of state regulation under market economy. In industrially developed economy the state and the market aren't contrasted; besides the market mechanisms one can also find functioning of the self-regulation and regulation mechanisms and, first of all, indicative management should be mentioned

Such an approach was first proposed by the American economist (from Germany) Landauer (1944). According to this approach the government influences an economic development rather by means of coordination and providing with information, than by making decisions and issuing instructions. The state, relying on possibility of planning and economic regulation, should adjust the arising deformations and moreover it should periodically return the market relations in the mode of perfect competition; as for the economy it must be put in a dynamic balance position, and finally the subsistence level of consumption of the vulnerable social group should be up to acknowledged standard.

There is no precise definition of "indicative planning" (IP) or "indicative management". One of the first definitions of IP is given by the Italian scientist Dallago (1990). In his opinion, an indicative planning is a kind of macroeconomic planning and conscious activities of public administration, the purpose of which is to lead the national economy to the desired effect by maturity. Thus the constituted plan documents contain only general

forecast contours regarding a desirable economy development, besides these papers also state the decisions on the public expenditures, investments and current business expenses.

We consider that an indicative management is a coordination mechanism of the interests and activity of the state and non-state economic entities. It is based firstly on the indicator forming system of social and economic development and secondly on the establishment of the government interventions for their achievement. The indicative management is a method of the economic regulation by means of promotion of the particular development purposes and creation of the state incentives for those commercial enterprises which agree to work according to these state recommendations.

We believe that the concept "indicative planning" does not fully reflect its content. It is not only about working-out of a plan, but it is also related to the specific management techniques: that is the impact of a managing subsystem on the managed system. Therefore it is not surprisingly to speak about the requirement of implementation of the indicative management system.

The development of an indicative management took several forms corresponding to various stages of the state economy regulation (Table 1). A transition of the indicative management from one form to another ("cyclical" (short-term) – "structural" – "strategic") assumes a degree increase of its efficiency and a lean cooperation level of all relevant regulatory institutes. This evolution took decades and it was expected in different countries.

Table 1. Characteristic of Forms of Indicative Planning in different countries.

IP Forms	Functional List		Dominating tools	Illustration
	Regarding Macroeconomics	Social Welfare		
Cyclical (or short-term)	Anti-cyclic policy, maintenance of macroeconomic balance, effective use of production resources	Employment control, job creation policy, monetary assistance amount depending on the labor market situation, indexation	Short-term measures of monetary and fiscal policy	"The ten-year plan of a national income doubling " (1961-1970) in Japan, "An economic growth route model" (1976-1985) in Canada. The Forecast of Labor Department for 1986-1995 in the USA
Structural	Structural reorganization of the industry, directive changes of export and import, etc.	Training and personnel development programs suitable for sectoral structure; social integration into structural changes, consumption and insurance standards, their differentiation	Motivation on a tax subsidy basis, soft credits and other state supportive measures within selective structural policy	Japanese master plan (for 1960-1970 and 1969-1985) - the management concept called "growth poles"; Japanese master plan to reduce an excessive conglomeration of the population; close alliance between areas
Strategic	Fundamental research, innovative solutions in the area of high-quality production, ecological balance, regional planning	Education, advanced staff training for "economy of knowledge"(considering forecasts)	Institutional policy, development at micro, meso and macro levels of competitive advantages, strategic marketing	The 10th indicative plan of France (1989-1992). 6 development key points were established there. . Each of them was granted the status of the target state program secured by cost benefits

Different countries have got the same-type procedural algorithms of IP regarding their content and they are integrated with several well known Russian mathematical economic models. However the development of the relevant planned decisions and their statutory recognition are significantly different in the USA and Western Europe.

The European system and, first of all, the French system of indicative planning is based on the aggregate dynamic models of long-term forecasting, and as well as on the statistical concept implementation of national accounts. The indicative plan includes the middle-term objective statements to develop economy, estimated figures and tendencies, conceptual transform algorithms of structural proportions. Key plan sections are concerned with the economic growth, investments, financial flows, economy balance, inflation and competition. In most cases the strategic tasks are expressed in specific plan targets (quantity-based), but the last ones are of secondary importance.

The American practice of indicative planning can be conditionally called adaptive. The plan itself isn't created at all, but each task of the social and economic development of the country which is accepted to execution by federal

government, is stated by the special federal budget law. A primary state role in the USA is to ensure legal rules within which the economic transactions are taking place. Industries, where the state is neither a producer, nor a buyer, are influenced by their decisions: through subsidies and taxes (direct and indirect), and also by means of the regulatory measures. So, it should be mentioned that in the USA the most important set of direct aid grants is intended to agricultural industry.

Thus, the state encourages some activities by subsidizing them, and constrains the others, imposing taxes on them.

In Russia we realize the synthesis of foreign indicative planning techniques. Thus their set contains the elements of both the American and West European techniques. The IP is a part of the state strategic planning. We understand that it is an element of the state development policy. Its subject matter is to form the long-term top priorities for further development of the socioeconomic system; to choose the achievement methods under a national legal framework and institutional restrictions of a national economic system by means of managerial function implementation by the authorized bodies; to develop a system of the mutually agreed plans and forecasts which are harmonized with the national socioeconomic policy.

3. Indicator system development in regional management

The central concept of system of indicative management is an indicator. It is the integrated indicator which quantitatively determines qualitative characteristics of an economic event, a process, a phenomenon. While in the indicative management the interactive indicator system is worked out . The system sustainability is characterized by correspondence of social economic system. Despite the attempts of scientists and public authorities, there is no universal indicative system of regional development management and regional cluster operation so far. It concerns not only Russia, but also many other countries which are actively using the mechanisms of indicative management (France, the USA, Canada, etc.).

Indicator systems allow different countries to assess the management quality and the status of the managed object. Social research is used for a quality management evaluation, for instance we can name the business cost level to overcome administrative barriers; or government work to provide the state services evaluated by the citizens. One of the indicators is the integrated international indicator GRICS (Governance Research Indicator Country Snapshot). It is focused on the economic development of a private sector in the country regardless of state character (a geographic location, natural climatic conditions, land, resources, etc.). Different rating systems are used to evaluate the control object. But they could be excessive and besides they aren't related to the long-term achievement.

We believe that such an approach concerned with the indicator system development does not provide the objectivity and the full assessment of public administration. And it can't be taken as a basis for the formation of the indicative management system. In our opinion, all set of indicators should be divided into three groups:

- "status indicators" describe exactly the status as well as the status changes or some process movement. Neither the federal government nor regional authorities can't directly influence these indicator changes;
- "driving force indicators" represent the indicators by means of which it is possible to estimate consequences of the decisions made by public authorities;
- "response indicators" are designed to warn that an economy is being brought to a crisis and there is a need for economic policy changes. For example, a choice of some of the most important policy parameters for which the fixed development rates with specification limits are established. Overcoming of one of the thresholds means entering into a critical zone an unfavorable economic situation. It implies the need to carry out the corrective measures or to change one of the indicative plan tasks.

So in France an approach of a dangerous situation is judged by the following response indicators:

- the annual growth of the overall price level on consumer goods (by more than 1% compared with EU countries);
- cover ratio of import by export – 90%;
- growth rates: of the gross domestic product – 2%; of the industrial production – 2%; of the investments – 2,5%;

- an employment rate (the number of the unemployed is not more than 2,5% of the active population).

An establishment of similar indicators had a certain practical value to respond to the changes caused by market processes. But it required considerable efforts to form such indicators and didn't give rebalancing guarantees. Therefore, it is important to create an effective indicative system of the regional indicative management and the main requirement is imposed on its cluster development: to describe fully and at the same time not excessively social and economic development of the region and its cluster formations. Thus this system shall be suitable for an effective evaluation of management in practice.

We have developed a technique of the indicator formation to assess a sustainable development of the region in the long term. The proposed system of indicators is based on two principles: hierarchy and interdependence. The first principle implies to group all variety of indicators. These group division is performed by analyzing the goals of the development processes. The corresponding indicators used at various levels of target planning of economic processes reflect these processes (Table 2). As follows from its content there are 5 groups of indicators: universal, industrial, commercial, social and price indicator.

Table 2. Indicator Systematization of an economic system development.

Indicator	Format (character)	Code
GDP (GRP)	Multifunctional (Y)	Y1
Inflation	Price (P)	P1
Investment	Multifunctional (Y)	Y2
Real income of the population	Social (S)	S1
Industrial production	Industrial (I)	I1
Retail turnover	Trade (T)	T1
Oil and gas production	Industrial (I)	I2
Export	Trade (T)	T2
Import	Trade(T)	T3
Pipeline, electric, general cargo rates	Price (P)	P2
Energy output ratio	Industrial (I)	I3
Rate of exchange	Price (P)	P3
Expenditures	Social (S)	S2
Unemployment rate	Social (S)	S3
Consumer price index	Price (P)	P4
Lifespan	Social (S)	S4
Natural population decline	Social (S)	S5
Labor efficiency	Industrial (I)	I4
Construction, transport industries, telecommunication	Industrial (I)	I5
Average monthly nominal wage	Social (S)	S6
Oil price	Price (P)	P5

According to the combinations of indicative management levels the following groups of indicators are distinguished:

- R1 – harmonization group which covers all planning levels. They are compared at the subordinate levels with that one of the higher levels , providing a balanced vertical system of strategic indicative management;
- R2 – correlation group which provides neighboring relationship in case of program and goal planning between the country level and large territorial units as well as allows to determine the most priority areas of development according to regional resources;

- R3 – stabilization group which defines the basic guidelines of social and economic policy, influences the stability and human well-being as a whole;
- R4 – equalization group, which is connected with the budget support of the region recipients;
- R5 – coordination group which is focused on the ensuring equal development in all regions of each federal district;
- R6 – group of region sustainability. In our opinion, regions are to become the main conductors and executives of the state social and economic policy. The group indicators are designed to create a basis of strategic planning for ensuring stable development of the country as an entity of its regions.

Practical approval of the proposed technique was carried out in one of the Russian regions – Volgograd region. The social and economic development strategy of this region and its clusters has been studied up to 2020. The strategy uses 538 indicators to measure mission effectiveness. The significant number of indicators makes it difficult to control and monitor their achievement, and also complicates resources allocation process in the course of strategy implementation.

To solve the problem of scaling-down the control matrix by the traditional method they use the method of selection of the most significant indicators and they exclude from consideration those of them which are recognized as the minor. We believe that such an approach can't be considered acceptable from the standpoint of public authority supply, since in this case, in fact it is offered to reduce their purpose, objectives and functions. And this reduction will negatively affect a general state of the control system and, besides it will dilute the essence of the state economic policy since it won't meet one of the fundamental ideas of an effective management – the law of requisite variety.

In order to rationalize the resources allocation between the areas of an economic system which is expressed by the relevant indicator groups when using the analytic hierarchy process we set out the priorities of each of the indicator groups considered above. As a result we have received the following priority vector of the indicator groups in order of decreasing:

R3 (0.32) → R6 (0.24) → R1 (0.22) → R2 (0,09) → R4 (0.07) → R5 (0,06).

Using these priorities it is offered to carry out quality estimation of an indicative management of the region and its clusters by calculation of an integrated index (by formula of the weighted average). This integrated index reflects a general development trend of the national economy, both at the country level and at the level of the individual regions.

The principle of interdependence in the system of an indicative management implies the identification of correlations between the indicators creating opportunities for ensuring balance development and innovating resource allocation (Table 3). It has been created according to the strategy of Volgograd region.

Table 3. Example of strategic guidelines.

Area of strategic guidelines	Indicators
Developing human capital	Population satisfaction with the activities of the executive authority (R1)
	The average monthly nominal wage (F1)
	The crime amount decrease (R2)
Developing positive climate to run a business	Attracting all type investments (F2)
	Comfort level for business (F3)
	The number of high-capacity jobs comparing with the total number of jobs (R3)
Improvement of management system	Gross Regional Product (F4)
	Placement among similar economic systems (here taken Volgograd, Russian megacity) (R4)
Improvement of environmental quality	New housing supply (F5)
	Satisfaction with Public health service (R5)
	Satisfaction with the quality of education (R6)

The provided targeted strategic guidelines are grouped into 4 groups according to the scope of engagement, then each group has been divided into factorial indicators (index F) and resultants (index R). It has been done in order to carry out the correlation analysis and to find out the correlation ratio between them. According to these groups of strategic guidelines a comparison of factorial indicators and resultants has been made. It has been established that

they have a high degree of interference at each other and it could be demonstrated by the correlation coefficient matrix (Table 4).

Table 4. Correlation of factorial indicators and resultants.

	R1	R2	R3	R4	R5	R6
F1	0,6398	-0,9763	0,9595	-	-	-
F2	0,8949	-0,9264	0,9717	-1	0,9883	0,9787
F3	0,9428	0,8295	-	-	-	-
F4	0,6151	-0,9788	0,9595	-0,8604	0,9962	0,9650
F5	0,6509	-	-	-	-	-

On this basis the authors created the system of the regression equations reflecting an interrelation of strategic guidelines of Volgograd region development (Table 5). It represents the quantitative tool for predicting the quantitative indicator values of an economic system development based on their correlation.

Table 5. The regression equations for predicting the indicators of strategic guidelines of the region.

The dependence	The regression equation
F1-R1	$Y = 1,93 X – 2,6674$
F1-R2	$Y = 3176 X – 75657$
F1-R3	$Y = 0,0002 X + 26,995$
F2-R1	$Y = 0,078 X – 155$
F2-R2	$Y = -6,2 X +2165$
F2-R3	$Y = 0,3 X – 22,9$
F2-R4	$Y = 0,02 X +0,274$
F2-R5	$Y = 0,21 X +19,1$
F2-R6	$Y = 0,21 X +31,1$
F3-R1	$Y = 0,45 X +36,8$
F3-R2	$Y = 185 X – 1829$
F4-R1	$Y = 0,008 X + 37,8$
F4-R2	$Y = -1,46 X + 1174$
F4-R3	$Y = 0,07 X – 27,18$
F4-R4	$Y = 0,004 X + 0,004$
F4-R5	$Y = 0,05 X + 15,3$
F4-R6	$Y = 0,05 X + 15,3$
F5-R1	$Y = 33,4 X + 0,008$

4. Conclusion

Currently, we need other different approaches to organize the state economy management. The history knows many examples of an effective state management. Its validity and activity guarantee the achievement of social and economic development to a much greater extent than activity and validity of private-corporate management. So an indicative management is one of these approaches. Thus it is important to create a system of indicators and to provide result-based management built on a regulation of legal acts. For example, in the USA since 1993 the federal law "Government Performance Result Act" (GPRA) has been functioning. In Russia there also appeared a number of regulatory legal acts. According to them the executive authorities of sub-federal units of the Russian Federation are to prepare the relevant concepts, own programs and action plans which are interconnected by means of the task system and the sets of indicators.

Complexity of the indicative regional management actualizes the problem of resource allocation between the courses of strategy implementation, target programs, subprogrammes, etc. This problem in practice as a rule is solved by using different variations of expert techniques that reduces the degree of the resource allocation objectivity and it may result in a failure to achieve the target values of the indicators.

In order to formalize and streamline the resource provision of the priority sectors of the economic system we have proposed an appropriate methodical approach. It differs in quantitative accounting of a ratio between the sources of resources and priority development system. Besides this approach is adapted to the place distinctiveness and illustrated by an example of Volgograd region.

We have developed the indicator system which describes the economic processes in the region. It can be put into practice of an indicative management of the cluster structures. The created set of indicators will allow to carry out monitoring and to exercise anticipatory control.

Practical approval of the stated recommendations has shown that in regional strategies 3 priority directions should be highlighted, which are ranked as follows:

1. An ensuring of sustained economic growth rates and an improving competitiveness of the enterprises;
2. A development of the social environment;
3. A realization of the institutional transformations.

It is offered to perform resource allocation among them using the modified Pareto Principle (20:80).

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