# Organizational and Methodological Algorithm of Studying Economic Space Development

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*Abstract*—The article is focused on the organizational and methodological algorithm of the economic scientific research. Methods of economic research have been systematized according to its stages. Priorities and development trends in methodological approaches to economic space have been specified. Complex evaluation of the researched object's constituent elements' performance is of great importance and is viewed as a characteristic of the object which results from simultaneous and coordinated study of various indices reflecting all the aspects of the economic processes; it comprises generalization of the performance results of the production facilities, being based on the qualitative and quantitative deviations from the comparative base. The research rationalizes the application of the coordinates matrix method and elaborates its algorithm. It also proves that studying external environment as an impact factor on the object's condition provides the foundation for the situation analysis which has the purpose of studying a separate situation, evaluation of the impact factors, mechanisms, risks and obstacles and ways of overcoming them. The article presents a methodological support system which provides for the functioning of the sectoral production.

*Keywords—economic research, abstracting, economic analysis, synergetic approach, general scientific methods*

## I. Introduction

In different communities economic activity takes the form of various business operations and a number of business life facts of economic agents. Activity of the economic agents depends on their own needs and interests. Therefore, the task of the economist being a researcher is to define the principles or laws of development of such facts, which is expected to further affect decisions in economic policy that address particular problems and offer efficient solutions. Economic processes in different countries and in different historical periods display developmental similarities [20]. Studying these similarities is crucial for better understanding of the principles of economic evolvement in the future and allows avoiding recurring mistakes and miscalculations. Thus, the combination of historical and logical research methods makes a good basis for the analysis in this study [21].

## II. Problem Setting: Synergetic Approach to Complex Economic Systems

Modern economics deals with complex processes, hence it applies a so called synergetic approach in the researches. Such approach:

accentuates the processes of unstable equilibrium and non-stability of economic systems;

acknowledges the complexity and nonlinearity of socio-economic evolution;

presupposes possible effect of spontaneous economic changes on the emergence of crisis situations;

analyzes plurality, multi-directionality and varying quality of internal and external factors which may influence socio-economic development;

is based on the fact that the same effect in the economic system may be achieved due to different impulses [2].

Integrity of any economic system lies in the fact that all its subsystems irrespectively of their development level and properties are expected to serve one goal and facilitate the best results estimated according to certain criteria. When studying complex systems (sectoral production definitely being one of them) and their marketing infrastructure, such phenomenon as emergence shall be taken into account as it means having some properties that do not amount to the sum of the properties of the system's separate elements. For this reason when studying complex economic systems, it is advisable not to focus on the circumstantial, but rather concentrate on the links between the elements, order of their interaction and the extent of their dependence on the center of the system [7].

## III. Methodology of Efficient Economic Research

### A. Methods systematized according to the stage of research

Effectiveness of the research is directly dependent on the proper selection of the object from the outside material world according to the objectives of the research. Each object of study is placed in the environment and interacts with it. Thus, our primary task lies in defining the factors affecting the object of study, dividing them into essential and circumstantial and focusing on the essential ones. Selection of the essential impacts on the object

of study is practically important as it influences the credibility of the obtained results [6].

It is the situation analysis that focuses on the environmental impact on the condition of the object under study; the goal of such analysis is to study a particular situation, estimate the impact of different factors, mechanisms, current problems and methods of solving them.

The economic methodology in the administrative economic system concentrates on studying the dynamics of indices, but not the situation itself [2, 9]. Various economic reforms have greatly contributed to the transformation of the economic structure and required complete and detailed studying of the environmental impacts on the market. This resulted in applying modern methodology to complement the traditional methodological system (Fig. 1).

The basis of the traditional methodology and the economic one as well includes general scientific methods for theoretical and practical researches: analysis-synthesis, induction-deduction, analogy, modeling, etc. In present-day conditions the sequence of preparing and carrying out the research are being dramatically transformed.

In its development, methodology has been following such priorities as application of a wider range of modern tools and research methods, regular updating of scientific inquiry of the informational basis of study, rationalizing of the minimum significant levels of scientific inquiry and case studies as a counter to recently widespread chronological studies [1].

When studying economic phenomena, it is impossible to deny or ignore social patterns that underlie them [16]. The tendency of process development can only be ascertained after discovering the fundamental causes for its emergence.

Effective research requires involvement of professionals from different fields of science, experienced and knowledgeable enough to undermine the multifacetedness of various phenomena.

### B. Procedural guidelines for the sectoral production performance

New tendencies in economic research include evaluation of the lost opportunities in economic activity, methodological approaches to the evaluation of shadow economy in sectoral production, risks estimation and methods that help evaluate level of economic responsibility of businesses [11]. A better and more detailed characteristic of modern economic processes can only be achieved through improvement of methodological approaches to the evaluation of economic effectiveness of businesses [17, 18, 19, 22].

Sociological methods of research contribute to the formation of the aggregate picture of economic transformations as they have strong connection with the foundation of economic activity, i.e. motivation, business management system and sectoral management.

The total of the economic relations within the researched system is objective, dynamic and has to transform under the influence of external factors despite the interdependence of its elements, processes and there inherent contradictions [8].

The methodology of the economic research of condition and elaboration of the developmental potential of sectoral production is represented as a total of organizational, economic, financial, managerial, provisional, marketing, social and external economic mechanisms [4, 5].
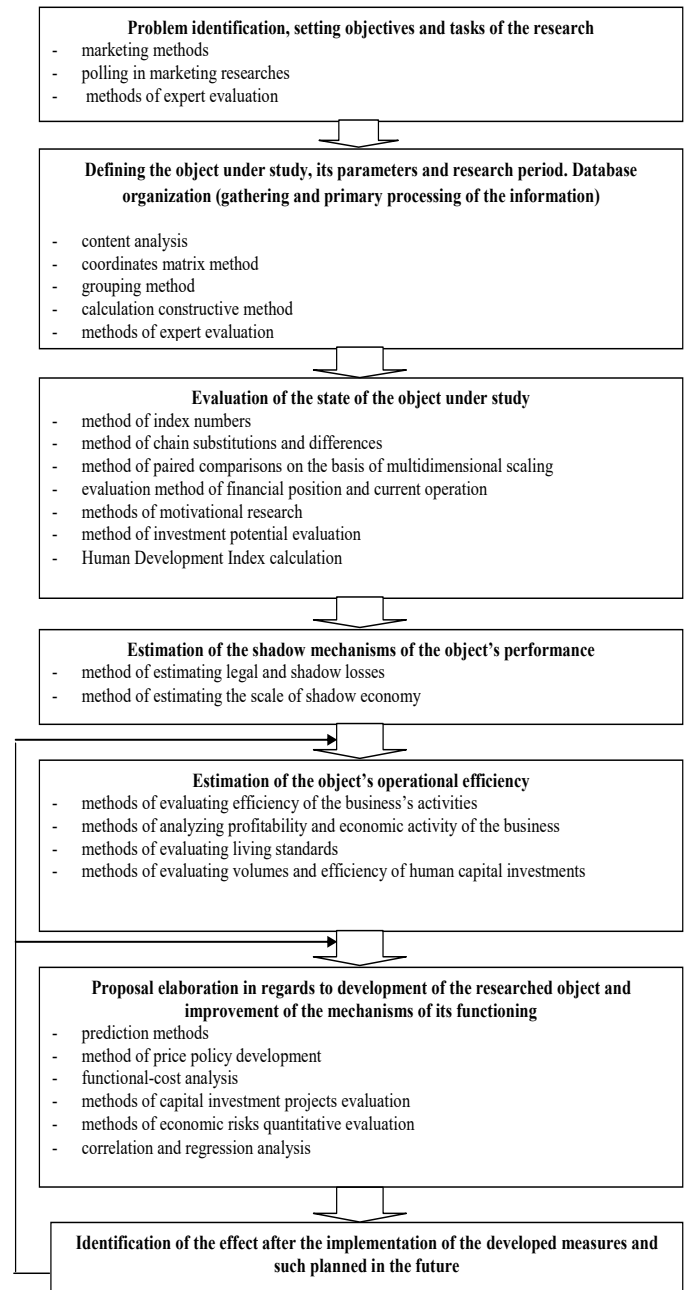


Fig 1. Methods of studying the object according to the stage of research (elaborated by the authors)

The generalized system of methodological background of functioning and developmental processes in sectoral production is shown in Figure 2.

Evaluation of the external and internal impact on the system of sectorial production performance

method of paired comparisons on the basis of multidimensional scaling;
methods of multiple classification;
methods of evaluating fundamental economic risks

**Processes of sectorial production operations in present-day conditions**

Financial and economic mechanisms management

methods of resource potential evaluation;
methods of financial analysis;
methods of tax burden evaluation;
methods of economic efficiency evaluation;
method of index numbers;
calculation construction method

Organizational mechanisms management

methodology of production stability evaluation;
methods of losses evaluation;
methods of calculating the reserves according to actual deviations;
methods of shadow economy evaluation; complex of forecasting methods (mathematical modeling in economics, index-based forecasting; trend extrapolation, Delphi study, etc.);
correlation and regression analysis

Provisional mechanisms management

Methods of forecasting needs in resources;
functional-cost analysis;
methods of resource availability evaluation;
methods of resource productivity evaluation in sectors;
methods of energy-dispersive analysis;
methods of analytical modeling

Market mechanisms management

methods of marketing researches;
BCG Matrix method;
estimation method of demand elasticity for resources and output according to price and income;
coordinates matrix method;
method estimating investment potential;
methods evaluating risks;
methods evaluating food supply security of the region

Social mechanisms management

methods of living standards and quality of life evaluation;
methods of shadow employment evaluation;
methods evaluating volumes and efficiency of working specialists' potential;
methods of motivation research

External economic mechanisms management

methods evaluating level of economic responsibility;
methods of quantitative evaluation of governmental support in the sector;
methods of tariff and tax burden optimization;
method evaluating Human Development Index

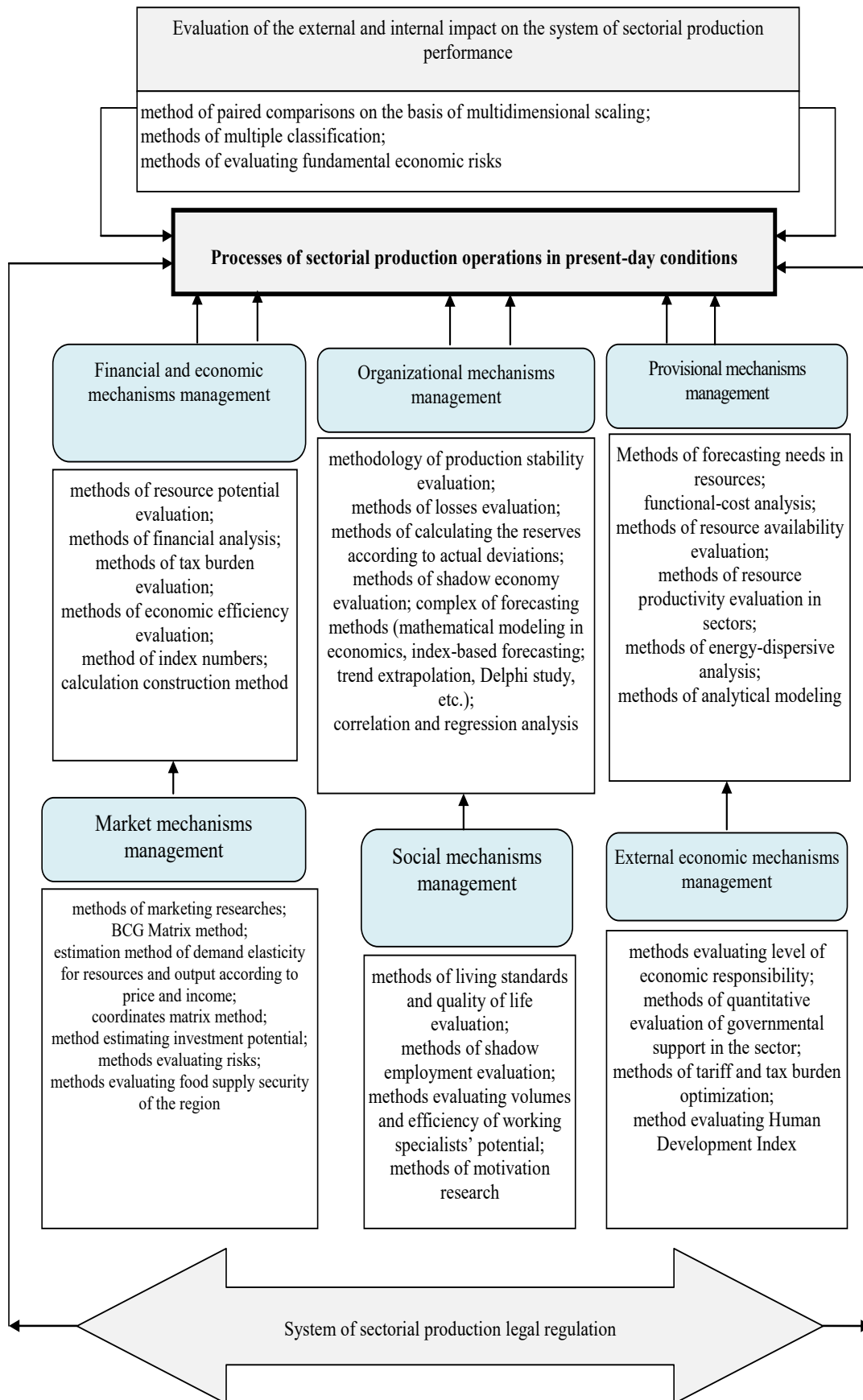System of sectorial production legal regulation

Fig 2. System of procedural guidelines for the sectorial production performance (systematized by the authors)

Studying the condition, transformational processes in sectoral production relations, formation and development of the production potential in general and within the constituent subsystems shall be preceded by evaluation, analysis and modeling of priority series of external and internal factors depending on the degree of their impact on the studied object [12].

When studying economic phenomena and carrying out the analysis of economic activity of separate businesses or an entire sector, the key aspect would be the research of their internal and external relations and dependencies. The economic system has to be treated as an aggregated total of causal relationships [3, 10]. Studying the relations system that defines an economic phenomenon allows analyzing its condition, detecting tendencies and potential for further development. This is achieved due to multiple factorial analysis, method of paired comparisons on the basis of multidimensional scaling and others.

For the purpose of estimation of the risks potential in the studied system, classification of risks and algorithm of their minimization have been presented. Studying of the present-day condition of sectoral production, management organization and developmental potential is possible within the paradigm of comparative assessment of production potential, financial position and economic efficiency of the businesses' or sectoral economic activity.

## IV. COORDINATES MATRIX METHOD

Currently much attention is paid to the complex evaluation of the studied object's structural components' workability which results from simultaneous and coordinated research of the total of indices reflecting various aspects of economic processes and contains generalized conclusions about the work results of the production facilities; the evaluation is based on the qualitative and quantitative deviations from the comparative base. The coordinates matrix method is well applied for the purpose of such evaluation and its algorithm is described below:

- Selection of the indices reflecting results of the economic activity of the object under study (Table 1).
- The maximum index is defined in each table line.
- Construction of Coordinates matrix 1: all the indices in the columns are divided by the corresponding selected maximum index.
- Construction of Coordinates matrix 2: the results of the calculations reflected in matrix 1 are squared (Table 2).
- The total of the obtained results is the integral rating index of the subjects of the Southern Federal District according to their economic development level.

The results of evaluating the aggregated level of economic development in the subjects of the Southern Federal District (as per Table 1 and Table 2) have the following rating tendency: Krasnodar Krai has the leading position followed by Rostov Oblast and the Republic of Crimea with the second and third best results respectively whereas the Republic of Kalmykia retains the lowest rating.

## V. CONCLUSIONS

Having analyzed the organization and conditions of the research, we have come to the conclusion that nowadays it requires involvement of the researchers with the whole new level of preparation, common application of marketing and sociological research methods, elaboration of methodological approaches to studying and evaluation of new economic phenomena (shadow economy, business activity transformation, evaluation of production and innovative potential of enterprises, etc.). Only the combination of these conditions guarantees efficiency of the research.

In regards to this, difficulties in selection of the appropriate for the research database are noteworthy. Thus, among the priorities in the development of economic methodology we could specify:

- use of a wider range of research methods;
- regular update of scientific inquiry necessary for the research basis;
- rationalizing of the minimum significant levels of scientific inquiry;
- implementation of the case studies priority strategy contrary to the recently widespread chronological one.

Economic phenomena are always socially defined and regulated and this calls for special attention. Thus, a tendency in process development requires explaining its formation. Efficient research is only possible with the involvement of experts from different sciences, which allows for the complex vision of the phenomenon.

The task of the economics is to undermine the real state of things irrespective of conformity with legal regulations, morality or requirements of efficient performance, i.e. it has to discover the regularities and relate specific facts to the elaborated ideas.

Modern economic processes can receive a more detailed and complete characteristic through improvement of methodological approaches to the evaluation of the integral efficiency index of businesses' economic activity.

Sociological methods applied in the research provide for having complete understanding of economic transformations as they are connected with the factor of motivation and system of management being the basis of economic activity [7].

The best position to be taken when researching the basics, condition, tendencies and results of the activity performed by any object under study is such allowing observation of interconnections and mutual effect of separate elements, constituent parts and impact factors with regards to their properties depending on the characteristics and dynamics of the entire integrated system.

Prior evaluation, analysis and external and internal factors priority modeling are necessary for studying condition of any object. Detailed analysis of its condition and detection of tendencies and real potential for development require complete studying of all the relations existing in the system and characterizing a certain economic phenomenon. Such evaluation calls for a complex of methods of multiple factorial analysis, method of paired comparisons on the basis of multidimensional scaling, methods of risks evaluation, etc.

TABLE I. Instruments of rating the subjects of the Southern Federal District according to their economic development, 2015 (completed by the authors on the basis of [13, 14, 15])

| Subjects of the Southern Federal District | GRP, mln. RUB. | GRP per capita, RUB in thousands | Industrial production index | Agricultural production index | Average monthly payment, RUB. | Fixed investments, mln. RUB. | Volumes of agricultural production in 2015, mln. RUB | Gross yield of grain, thousand tons | Level of registered unemployment, % |
|---|---|---|---|---|---|---|---|---|---|
| Republic of Crimea | 248280 | 130.6 | 112.4 | **124.8** | **30222** | 40197 | 58754.7 | 1263 | 1.0 |
| Republic of Adygea | 77923 | 174.02 | 103.2 | 106.9 | 21826 | 15548 | 19425.9 | 639 | 1.4 |
| Republic of Kalmykia | 46044 | 163.7 | 97.3 | 101.6 | 20063 | 16084 | 21625.7 | 345 | 2.1 |
| Krasnodar Krai | **1792048** | **330.1** | 100.7 | 103.8 | 26700 | **579908** | **333581.6** | **13708** | **0.7** |
| Astrakhan Oblast | 288951 | 283.6 | 106.2 | 101.5 | 25455 | 111562 | 37618.2 | 31 | 1.1 |
| Volgograd Oblast | 715050 | 279.0 | 99.2 | 94.6 | 24118 | 193342 | 125238.2 | 2922 | 1.2 |
| Rostov Oblast | 1000247 | 235.7 | **154.6** | 102.8 | 24657 | 291029 | 229342.8 | 9624 | 0.9 |
| The total across the district | 3920265 | 280.3 | 109.5 | 101.9 | 25279 | 1207473 | 766832.3 | 27269 | 1.2 |

TABLE II. Coordinates matrices (calculated by the authors)

| Subjects of the Southern Federal District | Coordinates matrix 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Republic of Crimea | 0.139 | 0.396 | 0.727 | 1.000 | 1.000 | 0.069 | 0.176 | 0.092 | 0.700 |
| Republic of Adygea | 0.043 | 0.527 | 0.668 | 0.857 | 0.722 | 0.027 | 0.058 | 0.047 | 0.980 |
| Republic of Kalmykia | 0.026 | 0.496 | 0.629 | 0.814 | 0.664 | 0.028 | 0.065 | 0.025 | 1.470 |
| Krasnodar Krai | 1.000 | 1.000 | 0.651 | 0.832 | 0.883 | 1.000 | 1.000 | 1.000 | 1.000 |
| Astrakhan Oblast | 0.161 | 0.859 | 0.687 | 0.813 | 0.842 | 0.192 | 0.113 | 0.002 | 0.770 |
| Volgograd Oblast | 0.399 | 0.845 | 0.642 | 0.758 | 0.798 | 0.333 | 0.375 | 0.213 | 0.840 |
| Rostov Oblast | 0.558 | 0.714 | 1.000 | 0.824 | 0.816 | 0.502 | 0.688 | 0.702 | 0.630 |

| | Coordinates matrix 2 | | | | | | | | | Total | Rating |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | |
| Republic of Crimea | 0.019 | 0.157 | 0.529 | 1.000 | 1.000 | 0.005 | 0.031 | 0.008 | -0.490 | 2.259 | 3 |
| Republic of Adygea | 0.002 | 0.278 | 0.446 | 0.734 | 0.521 | 0.001 | 0.003 | 0.002 | -0.960 | 1.027 | 6 |
| Republic of Kalmykia | 0.001 | 0.246 | 0.396 | 0.663 | 0.441 | 0.001 | 0.004 | 0.001 | -1.161 | 0.592 | 7 |
| Krasnodar Krai | 1.000 | 1.000 | 0.424 | 0.692 | 0.780 | 1.000 | 1.000 | 1.000 | 1.000 | 7.896 | 1 |
| Astrakhan Oblast | 0.026 | 0.738 | 0.472 | 0.661 | 0.709 | 0.037 | 0.013 | 0.000 | -0.593 | 2.063 | 5 |
| Volgograd Oblast | 0.159 | 0.714 | 0.412 | 0.575 | 0.637 | 0.111 | 0.141 | 0.045 | -0.706 | 2.088 | 4 |
| Rostov Oblast | 0.311 | 0.510 | 1.000 | 0.679 | 0.666 | 0.252 | 0.473 | 0.493 | -0.397 | 3.987 | 2 |

Complete in-depth analysis of the studied object's condition and efficiency is the cornerstone of successful elaboration and implementation of rational tendencies in the economic research for the purpose of its sustainability and increased effectiveness.

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