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## **DIAGNOSING THE SOCIO-ECONOMIC POTENTIAL DEVELOPMENT OF INDUSTRIAL ORGANIZATION (BASED ON MOSAIC EVOLUTION CONCEPT)**

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### **ДІАГНОСТУВАННЯ МОЗАІЧНИХ АСПЕКТІВ РОЗВИТКУ СОЦІАЛЬНО-ЕКОНОМІЧНОГО ПОТЕНЦІАЛУ ВИРОБНИЧОЇ ОРГАНІЗАЦІЇ**

*Changing views on the nature of development of socio-economic potential (based on its structural elements life cycle) has become a prerequisite for updating the methodical approach to diagnosis. The article represents the guidelines how to diagnose socio-economic potential development (based on mosaic evolution concept), describing main analytical procedures, and demonstrates practical results of its diagnostics (for objective components) according to the author's technique.*

*Зміна поглядів на природу розвитку соціально-економічного потенціалу (у контексті життєвого циклу його структурних елементів) стала передумовою для оновлення методичного підходу до діагностики. Стаття присвячена дослідженню можливостей діагностування мозаїчних аспектів розвитку соціально-економічного потенціалу виробничої організації. За авторською методикою проведено оцінку рівня розвитку соціально-економічного потенціалу машинобудівного підприємства, представлено результати діагностування мозаїчних аспектів розвитку.*

**Keywords:** *socio-economic potential, diagnostics of development, patterns and peculiarities of socio-economic potential development, mosaic evolution of socio-economic potential's structural elements, results of diagnosing the mosaic aspects in development.*

**Ключові слова:** *соціально-економічний потенціал, діагностика розвитку, закономірності й особливості розвитку соціально-економічного потенціалу, мозаїчна еволюція структурних елементів соціально-економічного потенціалу, результати діагностування мозаїчних аспектів розвитку.*

**Problem statement.** Now, in order to adequately respond to the extraordinary increase in the dynamism and complexity of external environment, to ensure the effective management of its socio-economic potential (hereinafter - SEP), the management of organization needs diagnostic tools that are suitable for determining the existing (or potential) problems, identifying its trends, developing the appropriate recommendations.

**Review of recent researches.** As platform for diagnosing the socio-economic potential of industrial organization (based on mosaic evolution of its structural elements) [1] under conditions that dynamically changing we used theoretical and methodological recommendations of scientists, who paid attention to: heterogeneous development phenomenon (A. Takhtajan [2], A. Selivanov [3]); patterns of socio-economic systems development

(O. Raievniewa [4], I. Sidorenko [5]), in particular, patterns of socio-economic potential development (N. Korshunova [6], O. Kozyryeva [7], O. Posilkina, O. Yaremchuk, and O. Horbunova [8], O. Chebanova [9]); considering cyclical factor of realization of potential (O. Bezruchko [10], D. Vasylykivskyi [11] and its components (O. Horiacha [12], O. Hopkalo [13]) and others. Despite the large number of scientific researches, solving the problems of diagnosing the socio-economic potential (based on mosaic evolution of its structural elements) requires a comprehensive study on a new methodological basis that leads to choose the topic of this study.

**The purpose** of the article is to apply the scientific and methodical tools for diagnosing the socio-economic potential development as a practical assessment of mosaic aspects in development of socio-economic potential.

**Results (Findings of research).** The methodical approach to diagnosing the SEP development (Fig. 1) [1] which develops methodical guidelines for diagnosing development of SEP [14] is to ensure that needs of organizational management are met with the use of traditional and new diagnostics tools considering specific nature of SEP development (based on its structural elements life cycle).

In order to solve the problems of in-depth diagnostics of SEP structural elements, which are at different stages of its life cycle, paper develops and practically tested idea of «mosaic evolution of social and economic potential» [1] for it says that «1) each structural element (of social and economic potential) is characterized by different stages of its life cycle and evolves at its own rate (i.e. evolves quasi-independently); 2) changes in individual structural elements (of social and economic potential) occur without simultaneous changes in other ones or at its own uneven rate». It partially confirms principle of mosaic unity (represented by A. Selivanov [3]) that based on «mosaicism as a specific type of unity of the system which not an integral system and not a summative system».

Results which expected from evaluation process should be the levels of development the structural elements (of social and economic potential) that can draw conclusions (for all structural elements being at different stages of their life cycle) and make selective recommendations for the development of social and economic potential. Considering nature of each structural elements (of social and economic potential) that includes as objective as well as subjective components it should be diagnosing the objective components only or/and diagnosing the objective and subjective components in common.

Studying capabilities of traditional tools for diagnosing mosaic aspects of social and economic potential (for objective components only) we discovered potential usefulness of: a valuation technique for potential development of the enterprise (by N. Vasyutkina [15]) that using Harington desirability function, and algorithm for integrated evaluation of pharmaceutical companies social and economic potential (by O. Posylkina, O. Yaremchuk, O. Gorbunova [8]) that using taxonomic method which allow to determine the appropriate level of consistency [15] or balancing elements of social and economic potential [8].

The set of indicators to determine the level of development for each of structural elements (of social and economic potential) is not the same for different industrial organizations, because it depends on specifics of their activity. Also each of structural elements (of social and economic potential) can be evaluated with varying degrees of detail. As input data for diagnosing mosaic aspects of social and economic potential (for objective components only) we used integral indicators of implementation of economic potential components (over past 10 years) calculated by O. Bezruchko [10, p.100-101] (table 2.6). There are indicators choosing for each of structural elements (based on results of previous analysis [10]):

indicators for manufacturing and technological capabilities – stimulants (e.g. technical equipment of labor, share of fixed assets in value of property, fixed assets productivity, return on fixed assets, stocks turnover ratio, profitability of production), and dissimulator (e.g. suitability of fixed assets coefficient);



**Fig. 1. Stages of methodical approach to diagnosing the development of SEP of industrial organization**

*Source: Author's own development [1, p. 154]*

indicators for labor potential – stimulants (e.g. rate of increment of middle level employees of enterprise, productivity, expenditures on advanced training (per 1 employee), ratio of productivity growth and wage growth);

indicators for financial potential – stimulants (e.g. turnover rate of working capital, profitability of working capital, coefficient of liquid solvency, coefficient of financial independence, maneuverability of working capital, coefficient of financial stability, financial leverage);

indicators for investment and innovative potential – stimulants (e.g. return on assets, return on investment, rate of increment of expenditures on innovation activity);

indicators for marketing potential – stimulants (e.g. cost-effectiveness of products; rates of increment of production; share of domestic market);

indicators for organizational and managerial potential – stimulants (e.g. efficiency of management costs; ratio of growth rates of management costs and growth rates of production);

indicators for sanitation potential – stimulants (e.g. Beaver coefficient; Altman Z-score; coefficient of business insurance);

indicators for strategic potential – stimulants (e.g. proportion of strategic investments in total expenditures; rate of increment of strategic investments).

Various dimension of indicators that form integrated level of development for each of the structural elements can be caused: the calibration [15] converting all indicators in dimensionless partial quality (by desirability function), which are distributed within the interval (0; 1) (the 1<sup>st</sup> tool), or standardization of all-size indicators into partial indicators (by taxonomic analysis [15]) (the 2<sup>nd</sup> tool).

Taxonomic indicator of development level is a «synthetic» magnitude of all the features that characterize each of the SEP structural elements, allows us to improve these indicators, to detect changes in their dynamics and «bottlenecks» that have the greatest influence on level of SEP structural elements. Interpreting the values of desirability function (according to the Harrington scale) we identified levels of development of SEP structural elements [15] (powerful potential; high potential; medium potential; low potential; critically low potential).

Tabular results of diagnosing the mosaic evolution of the structural elements (of social and economic potential) based on PJSC Kredomash case [10] are represented at table 1. The overall level of development (of social and economic potential) (by years) are identified based on structural elements with the lowest level of development [2], by integral index of SEP' realization level [8, 10]. During interpreting the results [1] primary form for diagnostics was upgraded with additional feature – «intensity of changes in level of development» [16] (e.g. «intensive recession»; «moderate recession»; «invariance level of development»; «moderate development»; «intensive development») because of needs to identify trends of development for problematic structural elements (of social and economic potential). It significantly increased information value of diagnostics results and allowed to see heterogeneity of development all structural elements, to identify the most problematic – organizational and managerial potential (in 1<sup>st</sup> year). Additionally, we evaluated concordance of structural elements development with «level of coherence development of structural elements» (using the coefficient of variation) [1] and assessing «level of balancing the structural elements development» [8].

The volatility is assumed to be: insignificant, if the variation does not exceed 10%; average - if the variation is 10-20%; significant - if the variation is more than 20% but not more than 33%. In our case, there is only two periods with higher volatility in SEP's structural elements development («weakly concerted» 5<sup>th</sup> year; «insufficiently coordinated» 7<sup>th</sup> year), and «weakly concerted» 6<sup>th</sup> year (assessing «level of balancing the structural elements development» by coefficient of synergy [8]). For other periods we see evidence efforts by managers to ensuring the concerted development of structural elements.

Monitoring the results of the managerial policy to ensure consistent, dynamic development of all areas of activity of PJSC by the integral and relative (due to the intensity of changes - growth rates) indicators of the development of its structural elements during last 10 years,

**Table 1. Dynamics of development of the structural elements of social and economic potential (case of PJSC)\***

Object of Diagnostics – SEP’s structural elements	Results of Diagnostics	Period of Diagnostics (10 years)									
		1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year	5 <sup>th</sup> year	6 <sup>th</sup> year	7 <sup>th</sup> year	8 <sup>th</sup> year	9 <sup>th</sup> year	10 <sup>th</sup> year
Manufacturing and Technological Capabilities	Level of Development	low	low	medium	high	low	low	medium	high	high	high
	Intensity of Level Changes	intensive recession	invariableness	intensive development	intensive development	intensive recession	intensive development	intensive development	intensive development	intensive recession	intensive development
Labor Potential	Level of Development	low	critically low	medium	high	critically low	high	medium	high	medium	powerful
	Intensity of Level Changes	intensive recession	intensive recession	intensive development	moderate development	intensive recession	intensive development	intensive recession	intensive development	intensive recession	intensive development
Financial Potential	Level of Development	low	low	low	medium	medium	medium	medium	high	high	high
	Intensity of Level Changes	intensive recession	intensive recession	intensive development	intensive development	intensive development	intensive development	intensive recession	intensive development	intensive development	moderate recession
Investment and Innovation Potential	Level of Development	low	low	medium	high	critically low	medium	medium	high	high	high
	Intensity of Level Changes	intensive development	intensive development	intensive development	intensive development	intensive recession	intensive development	intensive recession	intensive development	intensive recession	intensive development
Marketing Potential	Level of Development	medium	low	high	high	critically low	medium	low	medium	low	high
	Intensity of Level Changes	intensive recession	intensive recession	intensive development	moderate development	intensive recession	intensive development	intensive recession	intensive development	intensive recession	intensive development
Organizational and Managerial Potential	Level of Development	critically low	low	medium	medium	critically low	medium	powerful	high	high	powerful
	Intensity of Level Changes	intensive recession	intensive development	intensive development	intensive development	intensive recession	intensive development	intensive development	intensive recession	moderate development	intensive development
Sanitation Potential	Level of Development	medium	low	medium	medium	low	low	low	medium	medium	medium
	Intensity of Level Changes	intensive recession	intensive recession	intensive development	intensive development	intensive recession	moderate recession	intensive recession	intensive development	moderate development	intensive recession
Strategic Potential	Level of Development	medium	low	medium	low	critically low	high	powerful	medium	medium	high
	Intensity of Level Changes	intensive development	intensive recession	intensive development	intensive recession	intensive recession	intensive development	intensive development	intensive recession	intensive recession	intensive development
Level of SEP’ development	by the lowest value [1]	critically low	critically low	low	low	critically low	low	low	medium	medium	medium
	by integral index of realization [10]	Low	low	acceptable	sufficient	low	acceptable	acceptable	sufficient	acceptable	high
Concordance of SEP’ structural elements development	Level of development coherence (by co-variation [1])	concerted	well-coordinated	well-coordinated	concerted	weakly concerted	concerted	insufficiently coordinated	well-coordinated	concerted	well-coordinated
	Level of balanced development (by coeff. of synergy [8])	totally concerted	totally concerted	well-concerted	concerted	totally concerted	weakly concerted	well-concerted	concerted	totally concerted	concerted

\* Source: Author’ own development.

we observe that objective component (of social and economic potential) has cyclical factor of realization of potential for almost all the key structural elements, which were developing by management efforts). But above all, there is a discrepancy in levels and rates of development of some structural elements, as well as (in)consistency of their development.

Considering PJSC high sensitivity to changes in the macro level (in particular, worsening the financial and economic situation in the country and the world (especially on 5<sup>th</sup> year) is badly influenced the activity of the machine-building enterprise, causing a reduction in implementation of its potential for almost three times. Next 5 years period showed a high volatility as in structural elements development, as well in implementation of PJSC potential (especially because of loss of traditional markets, at the same time, PJSC began actively diversifying its product portfolio, has moved to new markets in the Middle East, Africa, Southeast Asia and other countries, which respectively marked on levels of realization of economic potential in 10<sup>th</sup> year [10].

It's impossible to explain these trends by impact of external factors only. We think that compatible diagnosis of objective and subjective components of social and economic potential, and diagnostics of social and economic potential's subjective component may be help to identify hidden internal causes of such negative dynamics and to make proper selective recommendations supporting the social and economic potential development (based on mosaicism concept «as an approach to practical regulation» [3]).

**Conclusions.** In conclusion, we determined that mosaic aspects of development are inherent for each of structural elements (of social and economic potential). Also, any structural element could be have the key resources and capabilities which being at different stages of their life cycle.

Further researches should be focused on developing appropriate diagnostics tools which allow to evaluate mosaic aspects in development of socio-economic potential considering guarantees for its integrality.

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