

Neo-Industrialization as a Priority in Urban Strategic Planning

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Abstract – The article discusses priorities in urban strategic planning by focusing on the case of an industrial city of Ekaterinburg in Russia. By applying elements of systems analysis and strategic analysis, which allowed to develop complex solutions for the growth of the city's economy, the authors show that the main goal in the development of Ekaterinburg's economy should be its transition to a neo-industrial economy. The study reviewed the concepts of "new economy" and "neo-industrial economy". Study of the functioning of the economic complex of the city of Ekaterinburg in terms of the types of system resources allowed authors to analyze a multifactorial SWOT-analysis of the competitiveness of the city and formulate the objectives and directions for its development in the future. Each direction covers each of the necessary type of resources.

Keywords: *strategic planning; new economy; neo-industrial economy; SWOT-analysis.*

I. INTRODUCTION

The Federal Law on Strategic Planning in the Russian Federation was adopted in 2014 (№172-ФЗ of 28.07.2014). This law became one of the key steps towards creation of a comprehensive system of strategic planning in the country. In Sverdlovsk region, this law led to the update of the Strategy of Socio-Economic Development of the Region until 2030 and to the creation of the Action Plan for its implementation. As a result, in December 2015, the regional government adopted the updated Strategy (law of Sverdlovsk region №151-O3 of 21.12.2015) and later, in 2016, the Action Plan (decree of the Government of Sverdlovsk Region (№ 595-III of 30.08.2016). These documents prioritized the project 'Strategies of Cities', which was aimed to build an efficient system of strategic planning, create or update strategies for socio-economic development of regional cities and towns.

This aim determined the legal framework that was applied to update the strategic documents of the region's capital city Ekaterinburg. It should be noted that in that period, the city government was still engaged in implementing the Strategic Plan for the Development of

Ekaterinburg until 2020, developed in 2003 and launched in 2010.

Meanwhile, however, the country had to deal with the new geo-political challenges, including the sanctions and the increasing economic pressure. At the same time Russia was also affected by such global processes as the rapid technology shifts; the inevitable change of the principles underlying industrial and economic development; the new strains of competition; and the Fourth Industrial Revolution (Industry 4.0). All these processes shape the new economic reality which the country and the regions should adjust to. This, in turn, leads to industrial restructuring; changes in demand for certain professional competencies and increased competition. Thus, the need for transition to the new economy is at the core of the economic section of Ekaterinburg's Strategic Plan.

Ekaterinburg is the capital of Sverdlovsk region and the Ural Federal District. The city originated as a fortress and a factory settlement and gradually grew into a large centre of mining and metalworks. In later periods, it became the administrative centre of mining industry in the Urals and Siberia, which determined the city's role as a major territorial and administrative centre for one of Russia's systemic industries. Its role as an industrial centre continued to dominate the city's history in the following periods. Recently, Ekaterinburg has started to transition from a manufacturing economy to a service economy, which should be also taken into account in strategic planning.

The aim of this research is to identify the existing and potential challenges and opportunities for the transition of Ekaterinburg to the new economy; to describe the corresponding goal-setting system by applying methods of systems analysis and strategic analysis; and to define the strategic areas of economic development.

II. LITERATURE REVIEW

To identify the goals and objectives for Ekaterinburg's economic development and its transition to the 'new economy', we should first clarify the concept of

the new economy, describe its main characteristics, and determine their relevance for the case of Ekaterinburg.

The phenomenon of the 'new economy' was for the first time officially mentioned in the US President's Economic Report of 2001, in which it was referred to as a result of the radical transformation of American economy. This new state of economy was primarily associated with those firms and economic sectors that worked with digital technologies and the Internet. Nevertheless, there is still no universally accepted definition of the term 'new economy'. In Russian studies, there are several approaches to this phenomenon.

N.A.Pashkus and V.Y.Pashkus [1] point out that there are three groups of interpretations of this term. There are interpretations spread by mass culture, that is, the new economy is seen as an array of companies working on the market of Internet- and information technologies. Business professionals associate the 'new economy' with the companies operating in fast growing markets. PR-technologists point out that the 'new economy' primarily refers to intellectual potential.

E.F.Avdokushin, the founder of the school 'New Economy', sees the 'new economy' as a 'knowledge-driven economy' or 'economy of intellectual services', which includes not only the information and communications technologies but also other technologies and the financial sector [2].

S.A.Tolkachev analyzes different approaches to the concept of 'new economy' and points out the following key characteristics of this type of economy:

- Internet and information technologies as the driving force of economic growth;
- high profitability of commercial IT projects due to the effect of scale;
- development of the 'knowledge economy', in which creative and intellectual industries play the key role;
- development of post-industrialism, which means that non-material production associated with creativity and innovation is gaining more importance while manufacturing is gradually losing its former significance.

In recent years, however, more and more specialists have been pointing out that at the current stage, Russia has no other efficient way of economic development but the industrial one [4].

The idea of new industrialization or neo-industrialization means that industrial processes are enhanced through technological innovation, which enables manufacturing industries regain their leading role in economy. Therefore, neo-industrial economy will be characterized by the following [6]:

- prevalence of intellectual labour, automation of certain production processes as machines will replace humans in doing monotonous, repetitive tasks;
- a shift in the structure of labour balance towards an increase in the share of workers with higher professional and secondary vocational education;

- science as a top productive force; a higher proportion of high-technology, knowledge-intensive industries;
- full-scale informatization and automation of production processes.

Studies of urban development, especially those dealing with large cities and regional centres, are crucial for our research, which focuses on economic development of a million-plus industrial Ural city. This group of studies includes those by Rondinelli D.A. [7], Roberts B., Hohmann R. [8], Treyvish A. I. [9], Markusen A. R., Yong-Sook L., Sean DiGiovanna [10], and Hodos J.I. [11].

Taking into consideration Ekaterinburg's industrial heritage and the current state of the city's and the country's economy (see Section IV), it would be more productive to consider the city's transition to the neo-industrial economy rather than to the new economy. We should also take into account the characteristics of Ekaterinburg's development as a large regional centre. In the light of the above, we can identify the key elements for the analysis of Ekaterinburg's current state and for strategic planning of its future development.

III. RESEARCH FRAMEWORK

The study is based on the following methods:

a. Systems analysis.

Systems analysis is universally applicable for studying various processes and phenomena and for elaborating solutions to complex problems [12]. Recently, systems analysis has started to be widely applied to study socio-economic processes as a way to find optimal and near-optimal solutions in the process of decision-making [13]. Analysis of the system according to the types of incoming and outgoing flows provides a general picture of its operation and allows to design a set of strategies and tactics for further development of this system. The following types of resources are usually considered in systems analysis [14]: material resources; energy resources; information resources; human resources; organizational resources; spatial and temporal resources. In case of socio-economic systems, the financial resource is also considered.

Our analysis of Ekaterinburg's economy focused on the above-mentioned types of resources and allowed us to identify the key areas in the city's strategic planning.

b. Strategic analysis and planning.

In [15], there is a detailed description of the modern approach to organization of territorial strategic planning based on the communicative approach, which allows to take into consideration opinions of all the key stakeholders [16]. Strategic planning for Ekaterinburg relied on the following: analysis of the current situation and assessment of the city's economy (strategic analysis involving the SWOT-technique); identification of the desirable image of the city in the future and the choice of the appropriate strategy of transition from the current state to the future, that is, goal/objective setting.

As a rule, strategic analysis and the SWOT technique are applied in strategic planning of organizations

to evaluate their strengths and weaknesses and identify what constitutes their competitive advantage. SWOT analysis means that the significant impacting elements are identified: internal factors (strengths and weaknesses) and external factors (threats and opportunities). Then the correlations between these elements are established in order to formulate strategies [17]. In our study, SWOT analysis of the city's current economic state focused on the types of systemic resources, which we identified through systems analysis. By applying such approach, we identified a set of the key strategic areas in the city's economic development.

For our analysis we used the Rosstat data for cities and regions of Russia; scientometric and patent databases; analytical reports of Sverdlovsk regional government and municipal authorities; rankings and research findings in the sphere of socio-economic development; and open on-line sources.

IV. PRACTICAL SIGNIFICANCE OF THE RESEARCH AND STRATEGIC PLANNING RECOMMENDATIONS

As our research has shown,

1. in its economic development Ekaterinburg should seek to transition to neo-industrialization rather than try to embrace the new economy and post-industrialism. The rationale behind such choice of priorities is the following: firstly, Ekaterinburg is the largest centre of the Ural macro-region, which is the country's old industrial backbone [18]. It is in Ekaterinburg that the country's most advanced machine-building enterprises and military industrial plants are based. Moreover, this city enjoys a developed academic research infrastructure, including the Ural Federal University and the Ural Branch of the Russian Academy of Sciences, which can play a major role in restoring the Ural school of engineering to its former glory. Secondly, the current level of industrial development, the city's and the country's economy in general makes it impossible to move away from manufacturing and transit to a knowledge-based economy [19], despite numerous attempts to do so. Therefore, a feasible scenario of the city's economic development would include restoration of the leading role that industry played in the region's economy; modernization of the technical infrastructure; fostering innovation in technology and business, communications and administration; and training highly qualified engineering cadres.

2. By applying the framework of systems analysis, we considered the systemic resources that are crucial for the city's economy and identified the main elements for further strategic analysis. To analyze the current state of the city's economy and its prospects of transitioning to the next stage of development, we identified the following types of resources:

- human resources: human capital, including competencies of the research and education sector;
- material: infrastructure, including investment and innovation; manufacturing facilities;
- spatial: availability of land and high quality production sites; agglomeration processes;

- financial: investment into the development of local, regional, national and international organizations; development of financial institutions;
- information-related: technologies, in particular production technologies, and innovative technologies developed and implemented by the city's enterprises;
- organizational: the legal framework and the city's economic policy, including programs that are a part of the regional policy; enhancement of cooperation between the academia, research, business and community; the city's business environment.

It should be noted that we did not consider time as a separate resource as there was a set timeframe – until 2030. The energy resource was considered together with other material (infrastructural) resources.

3. Our strategic analysis was primarily targeted at identifying the strengths that provide the city with a unique competitive advantage on the global market and highlighting the weaknesses that can be detrimental to the city's future development. SWOT analysis has shown that the main priority for the period until 2030 should be the creation of the largest interregional centre of 'neo-industrial economy' integrated into the global economy. To achieve this aim, it is necessary to ensure accelerated development of the city's intellectual capital, make its industrial complex more competitive and create favourable conditions for sustainable development of knowledge-intensive business. Table 1 shows the results of SWOT analysis for different types of systemic resources.

TABLE 1. COMPREHENSIVE EVALUATION OF EKATERINBURG'S ECONOMY (SWOT-ANALYSIS)

Elements of analysis	Internal factors	
	Strengths	Weaknesses
human resources	<ul style="list-style-type: none"> • developed research, education and innovation sector (cadres and technologies); • federal status university (Ural Federal University), participating in the '5-100 Project' for enhancing competitiveness of the leading Russian universities; • Ural Branch of the Russian Academy of Sciences; • development of the system for continuing education and training of specialists, particularly in engineering ('Ural Engineering School') 	<ul style="list-style-type: none"> • changes in the population's age structure due to the 'inert scenario' of development and the resulting decline in the working-age population • shortage of qualified engineering staff; imbalance between demand and supply on the labour market in terms of education and specialization
material resources	<ul style="list-style-type: none"> • unique structure of industrial production: accelerated rates of development of manufacturing industry; • high level of concentration of defense facilities in the region that determine the strategic areas for defense R&D and 	<ul style="list-style-type: none"> • low labour efficiency in comparison with developed countries, stemming from the insufficient technical infrastructure and low innovation receptivity; • some manufacturing facilities are unused or used inefficiently;

Elements of analysis	Internal factors	
	Strengths	Weaknesses
	<ul style="list-style-type: none"> production; developed innovation infrastructure (business incubators; technoparks, including the high tech park 'Universitetsky'; innovation infrastructure of the universities and the Ural Branch of the Russian Academy of Sciences; clusters); developed industrial infrastructure (industrial parks; free industrial sites) 	<ul style="list-style-type: none"> morally and physically obsolete equipment and information and telecommunications networks
spatial resources	<ul style="list-style-type: none"> Ekaterinburg is a major transport hub; Ekaterinburg hosts the headquarters of major global corporations and Russian branches of international companies; trends of polycentric territorial development; intensive agglomeration processes around Ekaterinburg 	<ul style="list-style-type: none"> high level of industrial pollution; limited land resources
financial resources	<ul style="list-style-type: none"> Ekaterinburg is one of the most dynamic million-plus cities in Russia: it ranks among the top large cities, following Moscow and St.Petersburg, in terms of the salary level, retail turnover; the turnover of food services; and the volume of paid services; diversified structure of the city's economy; in the Urals, Ekaterinburg is the leader in terms of the number of institutional investors 	<ul style="list-style-type: none"> inadequate mechanisms of financial support for innovation projects
information resources	<ul style="list-style-type: none"> Ekaterinburg is a macro-regional centre of business-services; thriving market of information and telecommunications services 	<ul style="list-style-type: none"> low level of innovation in economy; insufficient technological intensification
organizational resources	<ul style="list-style-type: none"> the city's administration is determined to increase the city's attractiveness for investors 	<ul style="list-style-type: none"> lack of innovation cooperation between financial, industrial and research organizations
External factors		
	<i>Opportunities</i>	<i>Threats</i>
human resources	<ul style="list-style-type: none"> attraction and retention of labour migrants, especially highly qualified engineering and creative specialists 	<ul style="list-style-type: none"> growing competition for labour migrants
material resources	<ul style="list-style-type: none"> availability of federal funds for creating and developing industrial parks and innovation infrastructure 	<ul style="list-style-type: none"> decreasing credit availability for enterprises, hampering their modernization
spatial resources	<ul style="list-style-type: none"> development of Ekaterinburg agglomeration: single labour market, single real estate market, single 'belt' of industrial enterprises, development of 	<ul style="list-style-type: none"> the federal government has no clear vision of the goals and objectives of agglomeration development

Elements of analysis	Internal factors	
	Strengths	Weaknesses
	<ul style="list-style-type: none"> cooperation 	
financial resources	<ul style="list-style-type: none"> the city participates in federal and regional programs in order to attract additional investment into and has successful experience of implementing private/municipal partnership projects to attract more private investment 	<ul style="list-style-type: none"> increasing competition for federal funding and external investors between the regions; fluctuations of prices for metals and energy resources in domestic and international markets; threats to the stability of the Russian financial system
information resources	<ul style="list-style-type: none"> the priority role played by the state in the sphere of digital economy and innovation; hosting major international events (Ekaterinburg has submitted an application to host EXPO-2025); the city is involved in the global trends, for example, disruptive innovation and economy intellectualization (Ekaterinburg has an adequate research and technological infrastructure): development of 'smart' and eco-friendly technologies; creation of 'smart' environments, 'smart' systems, including systems of 'smart' manufacturing 	<ul style="list-style-type: none"> inadequacy of the existing legislation, which is to ensure efficient knowledge transfer in manufacturing and protection of intellectual property
organizational resources	<ul style="list-style-type: none"> strengthening trade, financial and industrial ties and relationships between Ekaterinburg and its international partners, especially in south-eastern Asia 	<ul style="list-style-type: none"> inadequate tax legislation; the impact of external political factors, for example, economic sanctions

4. The above-described goal can be broken into the following sets of objectives.

Key strategic goals:

- 1) *creation of an industrial innovation centre;*
- 2) *development of Ekaterinburg agglomeration;*
- 3) *increasing the city's research potential to meet the needs of the 'new economy';*
- 4) *creation of an interregional centre for attracting financial and investment resources;*
- 5) *development of the city's digital economy.*

TABLE II. OBJECTIVES AND STRATEGIC AREAS OF DEVELOPMENT

Elements of analysis	Objectives and strategic areas of development	
	Objective №	Area of development
human resources	3	<ul style="list-style-type: none"> fostering the development of the system of continuous education for engineers; attracting intellectual cadres to the city's research and industrial sectors
material	1.4	<ul style="list-style-type: none"> technical modernization of the existing manufacturing facilities and their restructuring;

Elements of analysis	Objectives and strategic areas of development	
	Objective №	Area of development
resources		<ul style="list-style-type: none"> enhancing the efficient use of industrial and investment infrastructure; development of innovation infrastructure and stimulating business innovation; catalyzing the development of manufacturing services; stimulating knowledge-intensive niche manufacturing; development of business infrastructure
spatial resources	2	development of Ekaterinburg agglomeration to optimize the redistribution of manufacturing facilities and the labour market
financial resources	3.4	<ul style="list-style-type: none"> fostering university development; development of financial infrastructure
information resources	5	<ul style="list-style-type: none"> development of information and communications infrastructure and ensuring information security for business; maintaining sufficient innovation rates in the IT sphere; improving access to information and intellectual services for business
organizational resources	1.4	<ul style="list-style-type: none"> development of cooperation and new forms of interaction between research, academia and industrial enterprises; development of small- and medium-sized manufacturing enterprises; establishing modern institutions to support territorial development projects; enhancing efficient decision-making in the sphere of business development; encouraging the application of modern intellectual tools in interactions between the government, business and local community

Each strategic objective includes a detailed description of the key areas grouped according to the types of systemic resources.

V. CONCLUSION

In this study, we analyzed approaches to the concepts of new economy and neo-industrialization and formulated the transition to the neo-industrial economy as the desirable future state of Ekaterinburg's economy.

We applied systems analysis and SWOT analysis to identify the key internal and external factors that determine the city's economy aligned in accordance with the types of systemic resources. Our findings can be used for further strategic planning, that is, for goal/objective setting and establishing the corresponding key strategic areas of focus. We also provided detailed description of each objective, pointing out the steps and methods

necessary to attain it. Furthermore, we formulated our recommendations concerning the relevant strategic programs and projects and outlined their goals, objectives, and tactics.

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