

# Qualitative Assessment of the Potential of Innovative Development of Territories

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## Abstract

This article presents the results of a study of the relationship between the existing potential of innovative development of a territory that has received special status, and the conditions for moving to the next level of evolution. Inconsistency of the management system with technological potential hampers the industrial and socio-economic development of the territory. The analysis of production technologies opening in the status of resident revealed a negative tendency in a number of areas of priority social and economic development - residents offer technologies of a lower level than those in aboriginal enterprises. This situation is a clear sign of the degradation of the industrial development of the territory. Comparison of the potential that is unique for each territory and the potential necessary for the effective activities of residents will allow us to identify gaps between them and develop targeted programs for the formation of an appropriate institutional environment. Qualitative indicators of the potential for innovative development of the territory are proposed to be evaluated based on the level of technology of key enterprises. Consideration of the evolution of technological structures and the phase of industrial development of the territory on the basis of models of competitive strategies by I. Ansoff made it possible to propose five types of territories of advanced social and economic development in single-industry towns: an industrial city, agglomeration, innovative city, smart city, and cybercity. The presented classification, on the one hand, helps to identify weaknesses in the TASED management system, on the other hand, orients potential residents to the choice of a territory that is more consistent with the level of applied technologies of the created production.

**Keywords:** Territory of advanced social and economic development (TASED), innovative potential, technological structure, single-industry town, innovative development

## 1 Introduction

The classification of territories of advanced social and economic development (TASED) by the development potential of the territory (economic, demographic, by the income base of the territories) showed a variety of combinations of the initial factors of each territory (1). The proposed classification features are based on quantitative indicators of the development of a particular area of the territory.

It is proposed to evaluate the qualitative indicators of the development potential of the territory by determining the level of technologies used in production by residents or a city-forming enterprise. Advance development is not deployed on obsolete technologies. Russia lags significantly behind in the deployment of a new industrial revolution (Figure 1).

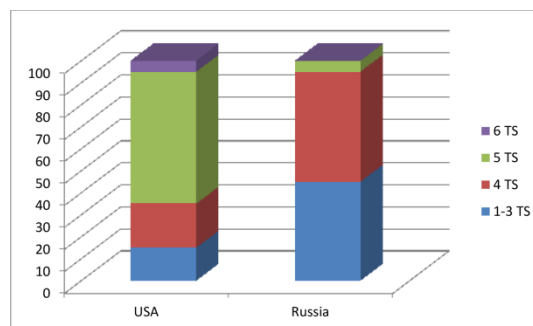


Figure 1: Share of production of different technological structures in the industrial production of countries, %, 2010 (2)

Recognizing the importance of enhancing innovative development by Decree of the President of the Russian Federation No. 204 dated 05.05.2018 "On National Goals and

Strategic Tasks of the Development of the Russian Federation until 2024”, the following priorities are identified:

- Accelerating the technological development of the Russian Federation, increasing the number of organizations implementing technological innovations, up to 50% of their total number;
- Ensuring the accelerated implementation of digital technologies in the economy and social sphere;
- Entering the five largest economies in the world, ensuring economic growth rates above the world while maintaining macroeconomic stability, including inflation, at a level not exceeding 4%;
- Creating a high-performance export-oriented sector in the basic sectors of the economy, primarily in manufacturing and agriculture, developing on the basis of modern technologies and provided with highly qualified personnel.

## 2 Methods

The existing potential for innovative development of the territory, which has received the status of TASED, is proposed to be analyzed according to the level of technology of the main production facilities of the territory. For single-industry towns, this will be a city-forming enterprise/industry. As a rule, the institutional environment of the territory (personnel training system, logistics, labor market, communal infrastructure, etc.) is “tailored” to the needs of these enterprises/industries (3).

When searching for a new production site, investors consider many factors (4), and first of all, the compliance of the institutional environment of the territory with business requirements (level of administrative barriers, availability, and quality of labor resources, openness of the system, etc.). In order to understand what qualitative characteristics of the external environment contribute to the transition of the territory to the next technological structure, TASEDs are classified on the basis of models of competitive strategies by I. Ansoff (5), the dynamic development of the enterprise by B. Lievegoed and F. Glasl (6) (Table 1). The phase of industrial development - “pioneer” - corresponds to the second technological mode (TM). Systemically important industries are mining and ferrous metallurgy. Achievement of the mode is the growth of production, the development of transport. The humanitarian advantage is the liberation from hard manual labor. The second TM corresponds to a repeating level of environmental variability, which is characterized by a rare introduction of new products into production, a repeating external environment, a long product life cycle, the emphasis in product development is fixed on extending the term of product use. At this phase of development, the TASED management function is reduced to collecting and processing information and solving operational issues. The amount of information for making management decisions is minimal. The authorities take separate decisions on the functioning of the TASED neglecting the opinions of the business and the expert community (Table 2).

The “differentiation” phase is characterized by an expanding level of environmental variability, which is coherent with the third TM. The backbone industries are heavy engineering, the electrical industry. Achievement of the mode is the growth of production, the development of transport. The

humanitarian advantage is the improvement of the quality of life of the population. The external environment is slowly changing and predictable; the system adapts to change. There is a low frequency of introducing new products into production and the product life cycle, the slow pace of technology change, an imitation of technology changes and a new type of products. Solving the issues of infrastructural development the authorities create a favorable business climate in the territory, contributes to the influx of investments. At this stage of development, agglomerations actively form (7). The main method is program-targeted. Goals, ways of achievement are set taking into account the available development resources. Development programs become a way of thinking, and achieving targets serves as a lever for managing the territory. Experts and entrepreneurs join the development of territorial development programs.

The fourth TM corresponds to the development phase “integration”, in which the system searches for habitual changes in a rapidly changing, predictable external environment. There is a moderate pace of technology change, the frequency of introduction of new products into production and the product life cycle, the emphasis in technology research and product development is on their improvement. The backbone industries are automotive, non-ferrous metallurgy, oil refining, synthetic polymeric materials. The main task of managing the operation of TASED is the integration of the production of residents and operating enterprises in order to build relations on the basis of dialogue and partnership with each other and the surrounding world. Territory management aims to develop ways to achieve long-term goals since qualitative changes require strategic approaches to solving problems. It becomes clear that the performance factor of the TASED is the degree of coordination of the actions of the organizations of the territory, as well as the level of interaction between the authorities, business, and science in the development and implementation of the development strategy. At this stage, the management of TASED moves to a qualitatively different level: self-control replaces control, self-coordination replaces coordination.

At the “association” stage of organizational development, the question of introducing innovations, expanding institutional forms and relationships is possible, the creation of new institutional structures of innovative development is demanded (at earlier stages they are created artificially). TASED begins to form the external environment itself, and the understanding of the priority of the quality of growth, and not just the growth of quantitative indicators, comes. At this phase, technologies of the fourth TM are naturally created and developed: electronics and microelectronics, information technology, genetic engineering, telecommunications. Achieving the mode is individualization of production and consumption. The humanitarian advantage is globalization, the speed of communication and movement. Traditional cities transform or new cities arise in the form of high-tech territories, including an effective management system, innovative infrastructure in production and the social sphere (housing, healthcare, education, leisure, etc.) based on the active use of information and communication technologies. Smart cities develop.

Table 1: Characteristics of the parameters of the external environment and the level of technological development of enterprises in the territory

| Parameter                                             | The level of technological development of key enterprises territory |                                        |                                                 |                                    |                                            |
|-------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------|-------------------------------------------------|------------------------------------|--------------------------------------------|
|                                                       | Second TS                                                           | Third TS                               | Fourth TS                                       | Fifth TS                           | Sixth TS                                   |
| A phase of development by B. Livehudu                 | Pioneer                                                             | Differentiation                        | Integration                                     | Association                        | Creativity                                 |
| Level of environmental variation                      | Repeating                                                           | Expanding                              | Changing                                        | Spasmodic                          | Unexpected                                 |
| The pace of change technologies                       | Very slow                                                           | Slow                                   | Moderate                                        | Borrowing technology               | The emergence of new technologies          |
| <b>Parameters of environmental instability</b>        |                                                                     |                                        |                                                 |                                    |                                            |
| The degree of openness of the system                  | Rejected changes                                                    | Adapts to change                       | Looking for the usual changes, asynergism       | Looking for a change, global scale | Looking for radical change, creativity     |
| External environment                                  | Repeating                                                           | Slowly changing, predictable           | Rapidly changing, predictable                   | Casual, predictable                | Inconstant, partly predictable             |
| Type of change                                        | Slower than the response of firms                                   | By comparing the response of firms     | By comparing the response of firms              | Faster than the response of firms  | Faster than the response of firms          |
| Frequency of introducing new products into production | Rare                                                                | Low                                    | Moderate                                        | High                               | High                                       |
| <b>Characteristic of technological structure</b>      |                                                                     |                                        |                                                 |                                    |                                            |
| Main resource                                         | Energy steam, coal                                                  | Electric energy                        | Hydrocarbon energy, the start of nuclear energy | Atomic Energy                      | Nanotechnology                             |
| Key factor                                            | Steam engines                                                       | Electric motor                         | The internal combustion engine, petrochemicals  | Microelectronic components         | Artificial intelligence                    |
| Product life cycle                                    | Long                                                                | Long                                   | Moderate                                        | Short                              | Short                                      |
| Emphasis on product design                            | Extension of the use of the products, cost reduction                | Simulation of a new kind of production | Product development                             | Development of new products        | Launch new products with preset properties |

Table 2: TASED grouping by the potential of innovative development of a single-industry town

| № | Technological structure | Type single-industry town | Characteristic                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---|-------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | II                      | Industrial city           | Territories are faced with an annual decrease in population, high unemployment, low-income base, as production with a low share of value added prevails. The main goal of the department is to create jobs, attract investments in fixed assets in order to improve the socio-economic development of the territory.                                                                                                            |
| 2 | III                     | Agglomeration             | The main goal of TASED is to provide the production of existing enterprises and residents with labor resources of the required qualification, to remove the existing restrictions in the sphere of production, transport and energy infrastructure.                                                                                                                                                                             |
| 3 | IV                      | Innovation city           | The main goal is to create/use innovation development institutions of the territory in order to attract residents, investing in the production of innovative products and creating high-performance jobs. The TASED strategy is aimed at forming a “flow of high-tech projects”, reaching the world level of competitiveness of residents' products, increasing the share of breakthrough world-class research and development. |
| 4 | V                       | Smart City                | A territory that is making conscious efforts to innovate the use of information and communication technologies in support of a more inclusive, diverse and sustainable territorial environment based on sustainable development principles. Companies come to the territory after highly qualified specialists who are demanding to the environment of their life, they need a high quality of life.                            |
| 5 | VI                      | KiberCity                 | Production of this level is practically not represented in the country, and there are no residents willing to develop production at this level.                                                                                                                                                                                                                                                                                 |

The next stage - “creativity” - is the least studied in Russian theory and practice, since there is practically no production of the sixth TM. The external environment is

unstable, changes rapidly and the effectiveness of TASED is impossible without focus on synergistic effects based on the introduction of basic innovations. Linear thinking attempts to

extrapolate past experience to the present, and even more to the future, are no longer a danger but a threat to the strategy of innovative development. The core of labor collectives when creating new jobs should be talented youth able to integrate new ideas (8). The innovation process is not only non-linear but also non-equilibrium, emergent, synergistic and therefore is out of traditional control (9).

### 3 Results and Discussion

The analysis of the specialization of 65 single-industry urban settlements that have received special status revealed that the basis of the economy in 20 single-industry towns is the production of the second TM (Figure 2). The criterion for classifying production as a specific technical condition is the use of technologies inherent in this structure in production, or technologies that ensure the production of products that, according to their technical or physicochemical characteristics, can correspond to the products of this structure.

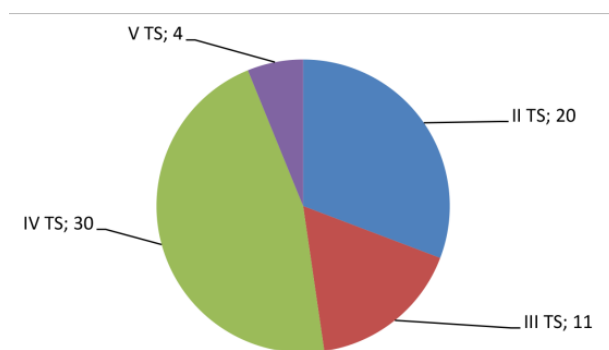


Figure 2: Classification of TASED by the level of technological development of a key enterprise of 65 single-industry towns

It is alarming that the TASED residents often open production facilities of lower TM than even a city-forming enterprise, where the difficulties in its activity cause the socio-economic situation of such a single-industry town to be classified as complex. For example, “Naberezhnye Chelny” TASED was created in the city of automobile manufacturers (TM 4). As residents, the production of the food industry, hockey sticks, etc. is opened. The resident with the technologies of the next TM (plant for the production of artificial sapphires) could not stand the competition and closed.

It turns out that when applying for the country's innovative development, in fact, through preferences, the state supports any production that meets the requirements for the type of activity, the volume of investments made, the number of jobs created, and does not regulate the level of technology used. It is especially important that the tax incentives provided to investors are not focused on “filling” ongoing investment projects, in particular within the framework of TASED, with modern innovative industries. A coordinated vision of the priorities of scientific and technological development, both at the federal level and in the regions, could solve this problem. Given the potential for accelerated development of territories,

such priorities are proposed to be consolidated in regional laws on industrial policy (10).

### 4 Summary

Inconsistency of the management system with technological potential hampers the industrial and socio-economic development of the territory. The analysis of production technologies opening in the status of resident revealed a negative tendency in a number of TASEDs - residents offer technologies of a lower level than those in aboriginal enterprises. This situation is a clear sign of the degradation of the industrial development of the territory. Yes, here and now, such industries solve short-term problems - attract investments, create new industries. But in the medium and long term, this is the road to nowhere - in the XXI century, in the era of the digital economy, state preferences are provided to organizations with automated and mechanized technologies.

### 5 Conclusions

A closed system with a bureaucratic management system gives no chance to innovative technologies to take root or develop. They need a system that is open to innovation, accepting the challenges of the time and ready for experimentation, and a pool of relevant development institutions (laboratories, research institutes, universities, etc.). Currently, mainly companies with technologies of 2-4 levels receive the status of TASED residents. In order to attract production with a higher level of added value (5 TM production) to the territory, it is necessary to create an appropriate institutional environment, as production data develop in an environment that seeks change, has a global scale, individualization of production and consumption, and a high frequency of implementation in production of new products, etc. To create such an environment, it is proposed to find out at what stage of evolution the industrial development of the territory is and to form the appropriate institutional environment to attract TASED residents with a similar or higher level of technological development.

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