

## Technology platforms: opportunities and development perspectives

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**Abstract.** The term “technology platform” is used to define thematic scopes in terms of which technological priorities are formed concerning state, business, science and education cooperation that are aimed to solve the problem of state technological independence. The authors have examined the implementation of this tool so that to concentrate essential resources in priority-driven vectors of science and technological advancement of a guiding cluster of innovative technologies in the field of space applications.

The term “technology platform” refers to a number of sufficiently multifunctional opportunities with relation to its application. Particularly its functional qualities are revealed not only in economical science that is special to up-to-date publications on the basis of this field, but primarily in technological. The later traditionally use this term to define the fundamentals of some manufacturing operations, which are accomplished on the basis of exact progression.

Current trends and the processes of knowledge globalization have considerably expanded the scopes of application range of the concept being under study. At present stage, the concept of the technology platform constitutes a set of technologies characterized by an integral field of knowledge.

Having analyzed the main conditions and descriptions of domestic and foreign technology platforms it can be stated that they have a lot in common concerning the ways of formation and development. At the same time there are considerable differences, i.e. European technology platforms have their own background (TP date of birth - 1988) and developed innovative infrastructure. In Russia (date of birth 2010 - 2011) the tool formation of TP is taking place under tough conditions such as low structuredness, lack of valid and well-timed data and backup of R&D. Besides, budgetary funding has great importance. In this case, private business, which is formed on the basis of extractive industry branch revenues, banking and trading activity, maintains its traditional focus and extremely unwilling attitude towards grand and long-term investment projects connected with large-scale reindustrialization of the country. In Europe, project financing is initiated by private business and demands minimum costs from the state. In Russia, innovative activity of enterprises is approximately five times lower in comparison with EU countries.

Basically, the practice analysis of this term implementation in modern publications shows that nowadays the term “technology platforms” is a macroeconomic guideline of innovative management.

Contemporary definitions of the term “technology platforms”, which are represented in Chart 1, allow asserting that it is substantially a matter of innovative infrastructure, which



makes it possible to provide the integration of state, science and business for the unity and concentration of essential resources in priority areas of science and technological advancement of the country.

Table 1 – Macroeconomic content of “technology platform” definition

Defined by European Council	Defined by the Russian Federation Government
“It is the union of state, business, science and education representatives around the overall opinion of the trend in science and technological advancement and building general approaches for development and industrial assimilation of the corresponding technologies”	“Communicative tool aimed to activate the efforts in creation of commercial proprietary technology, new products (services) for extra fundraising to implement the researches and investigations on the basis of all the related parties contribution (business, science, state, civil society), regulatory and legal framework improvement in the field of science and technological as well as innovative development”.

The analysis of the information represented in the chart makes it clear that in Russia the interpretation of the “technology platform” definition does not include such strategic aim as the overall opinion of the trend in science and technological advancement on the basis of general approaches for development and industrial assimilation of the corresponding technologies. This circumstance considerably reduces the opportunities of technology platforms in coordination the activities of all the entities in the long-term outlook.

In Russia, a mixed type of funding is supposed at the stage of decision making of the kind of technology platforms financial backing. Particularly, public contacts will be executed with the award-winning companies of open contests to fill orders in realization of research, development and experience efforts in terms of technology platforms. Besides, the maintenance of a flexible approach in the solution of this issue is possible that is financing of fundamental researches, less attractive for the business, could be mainly effected by the state. While, business community in its turn will execute financial investments into technological projects or R&D, which are attractive for the business from the point of view of their corporatization.

The implementation of this approach, which is considered to be much more effective in terms of existing practice in financing activity of clusters, will beyond question promote to the optimization of the technology platforms financing process that will result in the formation of conditions for their successful establishment, performance and further development.

Technology platforms feature as a sort of mechanism, designed to unite the efforts in formation of consolidated strategy of the trend development taking into account all the parties interests. The efficiency of projects, working on the basis of partnership approach of state, business and expert community, was clearly justified in the countries of the European Union. That is why European Technology Platforms, which have been implemented for decades, are chosen as a model for Russian technology platforms.

Technology platform represents a crucially new and quite complex instrument of national policy; it is the instrument of strategic rather than on-the-spot solution of existing problems, which must be disclosed in mid- and long-term plans.

Successful experience of technology platforms implementation encounters in innovative technologies cluster of CATU (Closed Administrative Territorial Unit) Zheleznogorsk, Krasnoyarsk region where the technology platform called “National information satellite system” (TP NISS), which is a kind of public-private partnership and a way of mobilization of stakeholders opportunities.

The strategic aim of TP “NISS” focuses on the creation of breakthrough technologies combination for:

- Drastic indexes increase in terms of user properties of new generation spacecrafts and availability of personal space packet service;
- Significant world market representation of advanced technology products and space, telecommunication services as well as other non-space branches of economy.

The aim of TP “NISS” is achieve such a level of consumer property in terms of national space communication cluster that would correspond to the interests of state, business and population.

Within a framework of the existing technology platform, a group of technologies will be developed in innovative technologies cluster in CATU Zheleznogorsk according to the following priority areas:

- Satellite construction. Unmanned spacecrafts: technologies of creation new generation aerospace equipment, technologies of information, control and navigating systems; space technologies of orbital attendance; technologies of creation energy efficient engines and drivers for transport systems;
- Microsystem electronics and professional equipment for space hardware: technologies of designing gadgets on the basis of micro- and nano-electromechanical systems; technologies of creation radiation-resistant computer-assisted participating databases of high reliability; technologies of high-performance autonomous energy systems creation including solar dynamics; technologies of micro- and nano-electromechanical systems.
- Advanced materials and technologies: technologies of modern versatile materials creation; nanotechnologies and nanocoating; technologies of creation and usage of composite materials; technologies of creation bulky flexible mechanical system; technologies of production specific optical, thermal, radio-technical blanketing of space vehicles external surfaces.
- Information and telecommunication systems: technologies of designing software and algorithmic software; technologies of math modeling of machine activity; technologies of math modeling of airborne antennas.
- Ground infrastructure improvement. Development of production and testing facilities: technologies of computer-aided testing; technologies of material and blanketing testing for space applicability; technologies of production metal nets out of gold-plated microwire with specific mechanical, radio-technical, optical and thermal characteristics to manufacture bulky flexible antennas; technologies of honeycomb panels production.
- Space services: technologies of broadband access to multimedia services; technologies of monitoring and forecasting of environmental status, prevention and clearance of its contaminations; technologies of prevention emergency situations of

natural and anthropogenic character; technologies of mining geophysics; technologies of monitoring and forecasting of atmosphere, hydrosphere, lithosphere and biosphere condition; technologies of creation GIS ( geoinformation systems).

Summing up what has been said the technology platform, which is the instrument of research and technology as well as innovative policy used to promote innovative development and retooling of economy, takes part in the solution of business problems in order to elevate the availability and drastically extend user properties of Russian orbit group.

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