

SYSTEM INNOVATION: CASE STUDIES

RUSSIA - System innovation and
transition processes in Russian
technology platforms



System innovation and transition processes in Russian technology platforms¹

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1. General approach

Technology platforms in Russia is a relatively new institutional form of cooperation between different actors in the framework of the STI policy of the Federal level. All technology platforms consist of a number of members that are interconnected by common objectives, technological areas and business perspectives. Some technology platforms are interconnected between each other by so called “universal actors” (universities or research organisations). The main instrument of Russian technology platforms establishment and development (so far) is **self-organization**. Transition processes within technology platforms involve practically all their members. The technology platform “Medicine of the future” which is considered as one of the most promoted is taken as an example within this case-study.

Initiative to stimulate establishment and development of technology platforms in Russia belongs to the Federal Government. The “Concept of Long Term Socio-Economic Development of Russia till 2020” adopted in October 2008 envisages establishment of technology platforms in the country and official call for proposals for establishing technology platforms has been launched in October 2010. By April 2011 the list of 27 technology platforms has been approved by the Russian Federation Government Commission on High Technology and Innovation. By October 2013 there were 34 technology platforms in Russia. All officially approved technology platforms are candidates to receive federal budget support.

What were perceptions and expectations of policy makers while discussing the idea of establishing and supporting technology platforms in Russia and taking corresponding decisions?

The main perception was that this new for Russia instrument would be a stimulus for high-tech sectors development, and thus new business demand for innovation would emerge. There was an expectation that new “actors” would be involved (first of all, universities) in innovation processes. And another expectation was that “technology mainstreams” would be activated thus increasing the capacity of technological modernization of the Russian economy.

Among 34 presently existing technology platforms two typical transition models can be identified: search model and consolidation model (Table 1).

¹ This case study is based on the template proposed by the OECD/TIP steering group of the “System innovations” project and devoted to reviewing Russian technology platforms’ transition processes that may be regarded as an example of a system innovations phenomenon in Russia.

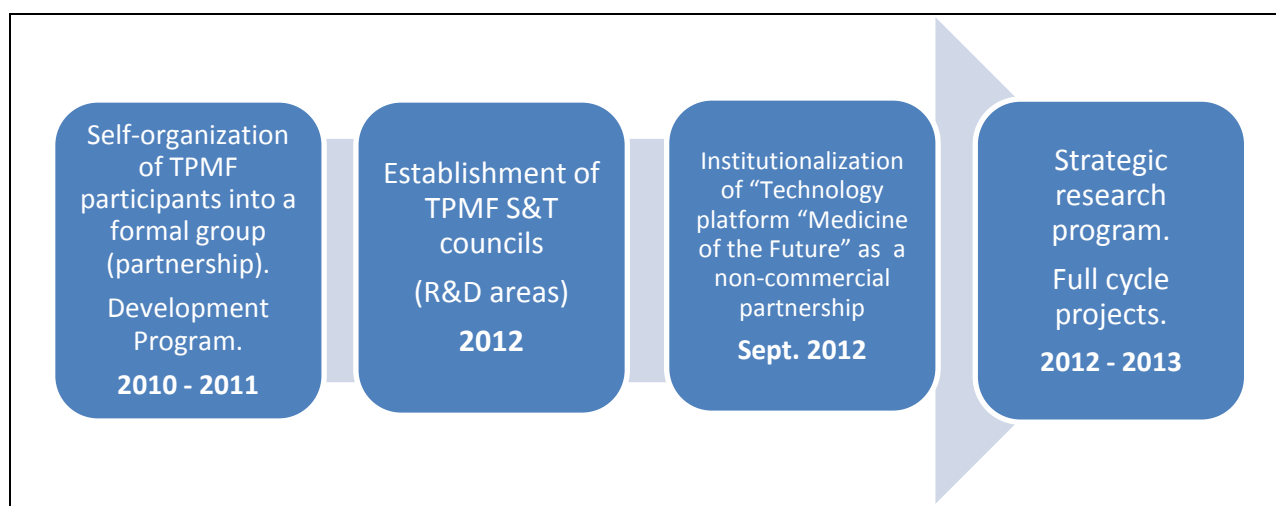
Table 1. Two typical transition models of Russian technology platforms

Search model	Consolidation model
Search for new perspective areas for S&T and economic development	Consolidation of efforts on implementation of priority areas of technological modernization
Type of governance: horizontal coordination	Type of governance: top – down model of management
Group of leaders	Core leader
Main drivers: societal and market demand	Main drivers: economic development policy and State S&T priorities
Grouping of actors around perspective vision: technological, societal or economic	Grouping of actors around a core leader : technological or economic

2. Selected case: Technology platform “Medicine of the Future”

Transition processes within Technology platform “Medicine of the Future” (TPMF) present the most interesting example of evolution of a search type technology platform of Russia. This evolution started two years ago after most of technology platforms have been established in 2010. Its main transition stages are shown at Figure 1.

Figure 1 Main transition stages of the technology platform “Medicine of the Future”



Being established in 2010, by 1 January 2014 the TPMF had 358 member organisations, including 147 business enterprises, 103 research institutes (including 30 of the Russian academy of sciences), 72 universities and 36 non-commercial entities (associations, scientific unions, etc.).

During 2012 a number of important organizational innovations within the TPMF took place, including:

First, the TPMF members have established 9 Science and Technology Councils in accordance with their research and production interests and specializations, including S&T councils on:

- Multicomponent bio-composite medical materials
- Diagnostics and therapy devices
- Innovation pharmaceuticals
- Diagnostics and therapy systems based on molecular and cell targeting
- Regenerative and cell technologies
- Nano-medical technologies
- Post-genome technologies
- Translational medicine
- Medical bio-information technologies.

Second, the TPMF members elaborated a “Strategic Research Program till the year 2020 and further perspective to the year 2030” (SRP). The SPR is based on evaluation of the current trends of the TPMF, related markets and technologies. It includes sectorial S&T foresight in the areas of the TPMF members’ interest and the roadmap of the most perspective R&D for the TPMF.

Third, a new technology platform development instrument has been formulated – “Full cycle complex project” (FCCP). The FCCP main idea is to solve nationwide social and economic problems taking into account achievements of the modern medical science and health care and existing drivers. The State program “Development of science and technology until the year 2020” and the Federal target program “Development of pharmaceutical and medical industries of the Russian Federation until 2020 and further perspective” are regarded as main drivers of the FCCPs in the framework of technology platform “Medicine of the Future”. In order to manage FCCPs their principle participants have established consortia, the main objective of which is to ensure FCCPs implementation from the stage of R&D till production and marketing. It is foreseen that in the process of FCCPs implementation in short -, medium-, and long-term perspectives a number of product families will be produced and marketed in accordance with the roadmaps elaborated for each FCCP.

In general there are 6 main stages in the process of FCCP formulation and implementation:

- 1 stage: Analysis of the sector S&T foresight (national and international) and elaboration of the TPMF Strategic Research Program;
- 2 stage: Elaboration of a draft FCCP on the basis of existing R&D results;
- 3 stage: Discussion and approval of the FCCP;
- 4 stage: Establishment of a consortium for FCCP management;
- 5 stage: Carrying out applied research and testing (preclinical and clinical);
- 6 stage: Production and marketing.

The main drivers of the TPMF development and transition are: industry/sector development programs, State (federal) R&D programs, societal demand, business demand. The key instruments ensuring transition of the TPMF are:

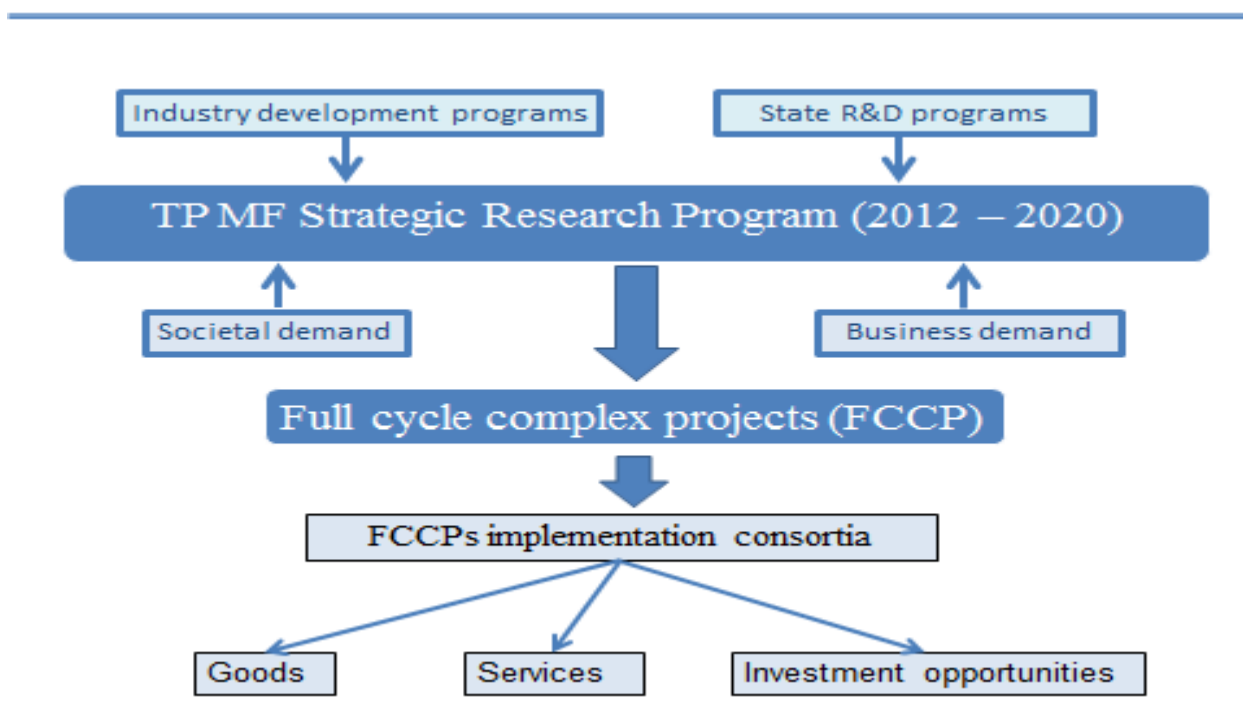
- Strategic Research Program (now available for years 2012 – 2020);
- Full Cycle Complex Projects aimed at social and economic results of the TPMF activities.

However 2 main bottlenecks can be identified in the process of the TPMF transition that do not always depend on TPMF management. They are lack of development supporting infrastructure and lack of funding.

There are two levels of interaction of the TPMF members. The upper level of interaction includes almost all members of the TPMF engaged in the process of elaborating the Program of Activities and the Strategic Research Program. The lower level of interaction includes interaction of TPMF members in drafting and implementing Full Cycle Complex Projects and in bidding for funding from the Federal Target Programs for applied research related to the areas of scientific interest of groups of TPMF members. This circle of interacting TPMF members is limited, it includes only the concrete FCCP participants.

Figure 2 shows the key drivers and instruments of the TPMF transition.

Figure 2 Key drivers and instruments ensuring transition of the technology platform “Medicine of the Future”



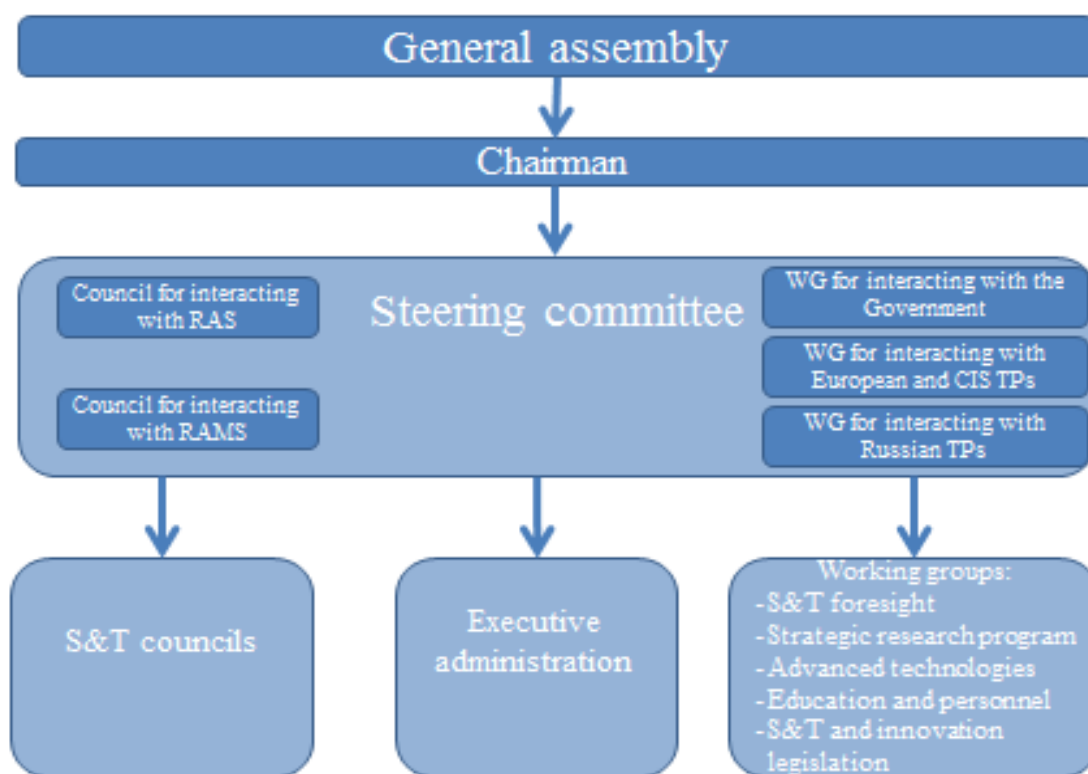
Technology platform as an ecosystem.

Following the concept of a business ecosystem (formulated by James Moore in 1993), a technology platform can be regarded as an ecosystem, as its members in the process of transition demonstrate the following features:

- both in search model and in consolidation model the basis of a technology platform transition is ensured by interacting organisations, including suppliers (R&D services of Universities and research organisations), lead producers (enterprises), competitors;
- members of technology platform coevolve their capabilities through implementing their main transition instruments (Strategic Research Program and Full Cycle Complex Projects) and are embedded in the environment established by the platform activities;
- member businesses tend to occupy their niche (first of all, FCCPs’ technology areas) and usually are challenged by newly arriving or even existing actors.

The TPMF governance structure (Fig. 3) which shows involvement of most of its members into interaction instruments activities is another proof of its ecosystem character.

Figure 3. General governance structure of technology platform “Medicine of the Future”



Specific policies of the TPMF transition are characterized by:

Policy paradigm – mainly networking model with elements of market and classic steering models;

Coherent policy measures in accordance with the S&T councils initiatives within interaction processes in which information is exchanged and resources consolidated;

Governance instruments – learning/consolidating process through seminars and project initiatives discussions;

Specific transition initiative and policy instrument - development of the Full cycle complex projects, envisaging implementation of the complete innovation cycle from R&D to goods and services production. In many cases this includes specific measures aimed at upgrading universities’ training programs.

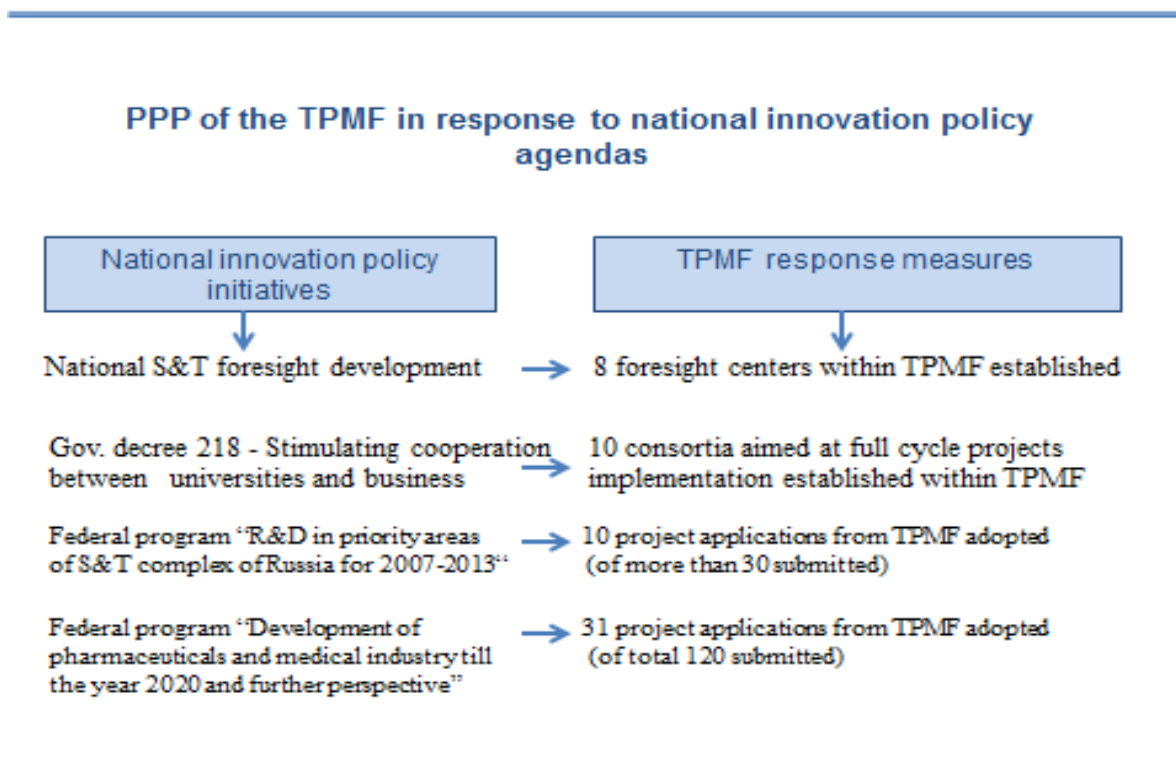
Public-private partnership.

Public-private partnership within TPMF is ensured through implementation of the TPMF Strategic Research Program (2012 – 2020) and FCCPs that unite financial, research and administrative resources to achieve concrete results. All 34 FCCPs of the TPMF approved by the

end 2013 include participation of both public research organisations, universities and business companies.

Another level of PPP of the technology platform is participation of FCCPs' consortia in implementing the Federal level initiatives (Figure 4).

Figure 4. Responses of Technology platform “Medicine of the Future” to national innovation policy agendas



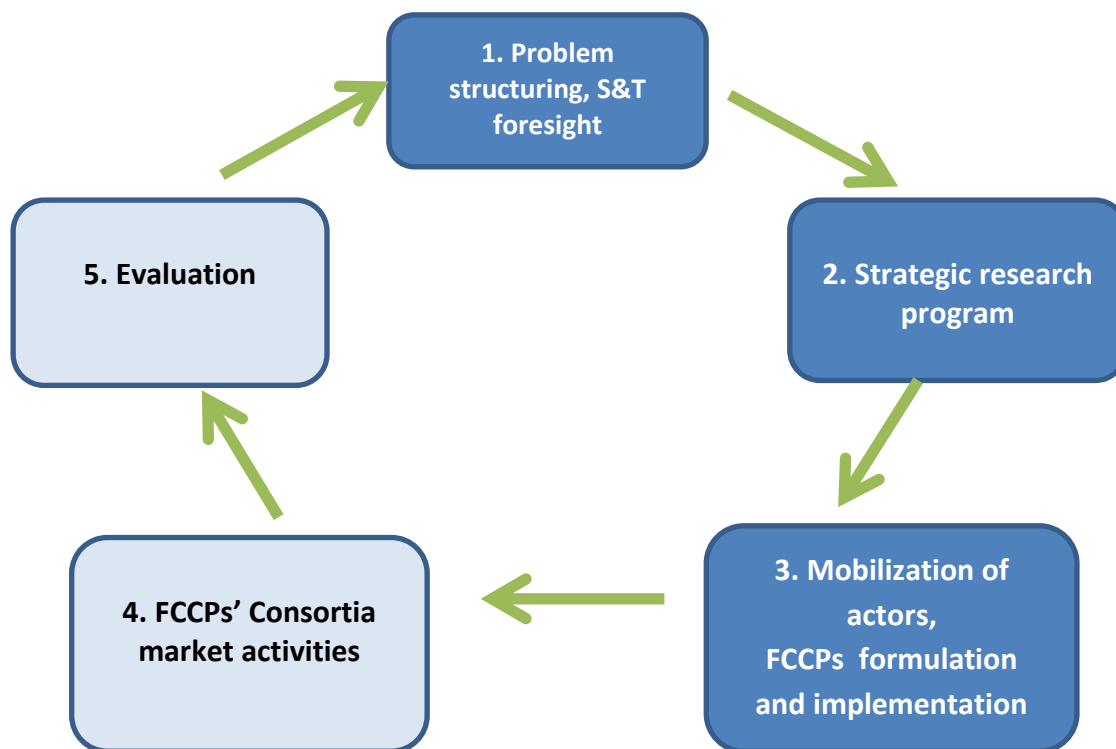
Technology platform transition management cycle

Standard transition management cycle of TPMF includes five consistent stages:

- 1) S&T foresight and problems understanding and structuring;
- 2) Elaboration and implementation of the Strategic research program;
- 3) Formulation of full cycle complex projects and mobilization of actors to implement them;
- 4) Market activities of FCCPs' consortia to implement corresponding projects;
- 5) Evaluation of the achieved results and starting a new transition management cycle.

As regards the state of the art of the TPMF transition management cycle, by the end 2013 it was at the end of the stage No. 3 – that is implementation of the Full cycle complex projects (fig. 5).

Figure 5. Technology platform transition management cycle



Policy impact analysis

Policy impact analysis of the TPMF activities has revealed 2 types of benefits so far: structural and societal ones.

Structural benefits. National innovation policy initiative to stimulate establishment and development of technology platforms in the Russian Federation has launched self-organization process of technology platforms which then transformed into coherent policy measures of the technology platforms' members based on exchange of information and consolidation of resources. These coherent policy measures allowed:

- 1) to institutionalize schemes of the technology platform governance (see, for example, Figure 3 - the general governance structure of the TPMF);
- 2) to organize efforts of the technology platforms' members into a workable scheme which allows to analyze, manage and adjust the transition process (Figure 5).

As a result of structural transformations within the TPMF by the end 2013 the Steering committee of the TPMF has approved 34 FCCPs that united more than 40 companies, 40 universities and 160 research institutes.

Societal benefits of the TPMF activities are mainly ensured by formulation of advanced healthcare technology areas, responding to societal challenge to combat socially important diseases, that are going to be R&D priority areas of the TPMF until 2020 (see science and technology councils' areas above).

Business benefits of the TPMF activities will be mainly ensured by perspective benefits of companies engaged in elaboration and production of perspective pharmaceuticals and medical

appliances and at the moment cannot be evaluated with the help of some success indicators. In future quantitative evaluation of the TPMF transition progress can be done with the help of indicators demonstrating growth of R&D funding and businesses' market share in domestic market first of all.

Risks. Some systemic risks in transition processes of the TPMF can be identified.

First, the risk of rent seeking behavior of the TPMF most active members. In this connection it is important to ensure systemic vision of the transition objectives and opportunities by all members of the technology platform basing on national strategic priorities.

Second, the risk of bureaucratization, when the rules of the game become formal and exclude creative behavior of the members of the technology platform.

Third, the risk of shifting to supply model development and loss of demand model development. Such distortion of balance between two development models may occur due to excessive orientation to budget funding and state privileges for the technology platform members.

Future policy perspectives. The TPMF activities at present are mainly aimed at strategic research planning and carrying out R&D in the framework of FCCPs based on market and societal demand. Future successful transition will require additional efforts, mainly in upgrading university programs, training research and engineering personnel and establishing new research and engineering infrastructures.

Finally, it should be emphasized that a new approach to S&T foresight will be required. The reason is that the TPMF technologically and socially sensitive areas (medical and pharmaceutical technologies) in future may come across new ethical and ecological bottlenecks. So, new legislation initiatives will be needed and this will have to be reflected in the TPMF development strategy.

International dimension of TPMF development shall be possible through Full Cycle Complex Projects aimed at competing global challenges and socially significant diseases, introducing targeted pharmaceuticals and therapy systems, etc.

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