



Review Article

Models and Mechanisms for the Management of ICT-Technoparks

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Abstract: The paper shows that the innovative development of economy requires improvement and systematization of management processes. And innovation is activated using modern forms of organization, application and commercialization of high technology through integration of science, education, manufacturing, business and government. These processes are jointly carried out by innovative structures. In this regard, the paper describes the control features of ICT-technoparks, which have interacting structural elements. The paper specifies imperfection of the current control systems of innovative organizations. Therefore, different approaches are given to the definition of the management content. It is proved that the problem of increasing the efficiency of the management process requires the development of complex control system of ICT-technoparks. The paper specifies the basic management levels of ICT-technoparks, and presents its tasks and functions, as well as the main activities of executive management of ICT-technoparks. The paper describes the basic model and business management model. Depending on the time factor, the strategic and tactical control aspects of ICT-technoparks are analyzed. As the management of ICT-technoparks is viewed as a complex socio-economic system, the public and collegial governance mechanisms are proposed. It is proposed to develop a control system of ICT-technoparks and an appropriate control mechanisms. These mechanisms take into account the key moments in the development process of innovative control system of ICT-technoparks.

Keywords: Innovative System, ICT-Technoparks, High Technologies, Technopark Management, Controlling of a Technopark, Managing Companies of a Technoparks

1. Introduction

Transition to innovative economy requires improvement and systematization of management processes, establishment of reasonable and long-term relationships between participants of the innovation process. Conducted studies show that innovation is activated using modern forms of development organization, application and commercialization of high technology by integrating science, education, manufacturing, business and government [1]. These processes are carried out jointly by innovative structures. Currently, such innovative structures are technology parks, techno-poleis, technology centers, etc. and organization of their activities also requires the development of effective

management mechanisms.

2. Purpose and Content of ICT-Technoparks

ICT-technopark is a term for an organization, which has ties with universities or research centers of industrial, regional and local authorities and administration, and implementing formation of the modern innovation environment on their territory in order to support innovative entrepreneurship by creating logistical, social-cultural,

service, financial and other bases for the effective formation, development, support and training for independent activity of small and medium-sized innovative enterprises, commercial mastering of scientific knowledge, inventions, know-how and science-based technologies and their transfer to the market of scientific-technical manufacturing [2,16].

ICT-technoparks in the high-tech enterprise combine the enterprises of high-technological branches of the economy, including sectors of nano-, bio-, information and other technologies, scientific organizations, educational institutions, providing scientific and personnel potential of such enterprises, as well as other enterprises and organizations whose activities are technologically associated with the organizations of identified branched or organizations focused on their service [3, 4]. ICT-technopark is defined as a form of organization of scientific institutions, design offices, educational institutions, organizations of innovation infrastructure, manufacturing companies or their divisions, which are compactly located in an isolated area.

ICT-technoparks have following interactive elements such as [4]: 1) government organizations and enterprises, 2) private organizations and businesses, and 3) universities and academic institutions. These structures have different capabilities. It is known that the state organizations and enterprises have significant financial resources and large administrative resources. In particular, the latest technology platforms can be created there. They also provide good assistance to the creation of the legal framework.

Universities and academic institutions have a good scientific and technical potential, as well as a large pool of scientific ideas and highly qualified personnel. Private organizations and businesses also have some funding. They are able to replicate high-tech products. Experience shows that the integration of these elements is possible only if they strive toward a common goal.

3. Characteristic Properties of ICT-Technoparks Management

Management of ICT-technoparks has many aspects. On one hand, the technopark - is an object, the framework of which requires full management of innovations, including project management, management of substantive directions of conducted developments, and investment management [10]. On the other ICT-technopark – is a business structure, engaged in rendering a wide range of professional services to innovative resident-companies. Finally, the technopark-is a property complex where processes of cost-effective property management must be organized. These management aspects require development of an effective management system, operation of which results in a balanced policy in the field of innovation, rendering services, property management, which leads to the achieving the objectives of creation of a technology park and stated targets of commercial and budget efficiency [3, 17].

The main objective of the management authority of a

technology park is to achieve advanced positions of information-technology branch on the global market through creation and improvement of high-tech and competitive production on the basis of favourable economic, social, legal and other conditions. The basic tasks of management authority of a ICT-technoparks are formed based on objective (Figure 1).

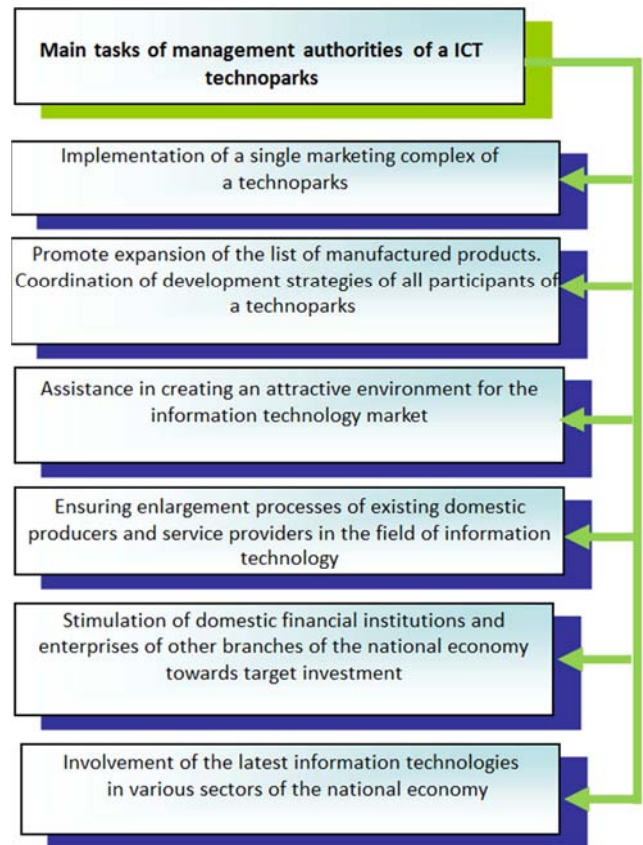


Figure 1. Main tasks of management authorities of a ICT-technoparks.

4. Basic Models of Management

The success of a technopark is largely dependent upon the effectiveness of choice of management model both at the creation phase and the development phase of the ICT-park. organization of transparent and clear relationship of management company and partners of the ICT-technoparks is an important element of the creation stage of a technopark, who are in the professionals that build the transferred part of the ICT-technoparks a timely manner in accordance with the requirements and wishes of its residents, but with the general requirements for construction of the park. In this regard, the relationship with the partners of the ICT-technopark is built by concluding investment agreements or joint venture agreements. At this, the right to lease land will be the contribution the management company, while the partner's contribution will be the funds needed for the implementation of its project. In proportion to the contribution, areas from constructed facilities may be transferred to the managing company according to the results of the project. Selection of

partners is carried out by the management company, taking into account the following factors: experience of realization of similar projects, sufficiency of financial resources for the completion of construction, as well as the existing preliminary contracts or bids from potential tenants - high-tech companies, etc.

Generally, two basic models of management technology parks "management company - operational management (OM)" and "management company - strategic management" are known in the world.

In the first case, the OM independently carries out all the functions of operational property management and operation [6]:

- Technical operation (operation of engineering infrastructure, support of real estate and engineering infrastructure in working order, maintenance, etc.);
- Commercial exploitation (marketing of ICT-technoparks, search of residents, holding of talks with residents, contracts, etc.);
- Rendering additional services (logistics, information technologies, legal, financial etc.).
- Besides, the OM independently carries out the operational management of innovation: management of business incubator, rendering innovative services, search and attraction of innovative residents, etc.
- In the second case, the OM of ICT-technopark independently carries out only strategic management of real estate:
- Majority of the functions for operation and provision of additional services (technical maintenance, commercial exploitation, rendering additional services) are outsourced, i.e. specialized are contractors involved for implementation of these functions;
- OM selects contractors and monitors their activities.

In addition, the OM of ICT-technopark attracts specialized outsourcing company for innovation management.

Both indicated models are widely used in the world. However, it should be noted that each model is rarely implemented in "pure" form. Typically, ICT-technoparks select intermediate options with a focus on one of these models. The choice of a management model depends on such factors as: 1) the objectives of technoparks operation; 2) type of property of technopark; 3) presence of the state as an investor, and 4) the level of development of service market for operation and maintenance of real estate and innovative management etc.

It should be noted that since the ICT-technoparks is an element of innovation systems, it is necessary to take into account that the formation and development of innovative systems are always in a constantly changing environment of innovation. Such an environment is a source of innovative ideas, development of innovative projects, their implementation and maintenance.

Business - management model. Upon comprehensive planning and organization of operations of ICT-technopark, also modern technology must be actively used to develop its own unique business model. Such models allow us to activate

innovative processes due to generation of science based business residents and provide achievement of the high productivity of operations of the technology park.

Business model in the general case is a harmonious blend of the company's objectives, management system, the requirements of the investment portfolio, of the interaction system of participating elements and principles of organization of activities of the technology park. [5]

Upon formation of the business model of OM of ICT-technoparks, it is necessary to carry out the evaluation of the parameters of external environment such as scientific and research potential of the region, innovative activity of scientific-research organizations and higher education institutions, priorities of regional socio-economic development, presence of free investment resources in the region and potential strategic investors, conditions of manufacturing and social infrastructure etc.

5. Controlling in Management System of ICT-Technoparks

Currently controlling systems are widely known in the world. Methods and techniques for controlling are reflected in companies in various fields of activity, from production companies to companies engaged in rendering services.

Controlling - is a comprehensive management system of technopark aimed at coordination among management systems and monitoring of their effectiveness. Controlling can provide information - analytical support of decision-making processes during the management of a technopark [11, 12].

Controlling is functionally particularly focused direction of economic and organizational work of the ICT-technoparks. Controlling faces two sets of problems: 1) a complex task management system development: development, implementation and continuous improvement of the management of the ICT-technopark and 2) a set of tasks of operational management support: ensuring coordination of management activities on development and the achievement of the targets of technopark management through the organization and implementation of informational-analytical support. Controlling is an indispensable element of technopark management system.

Controlling in ICT-technoparks should be focused on solving a number of strategic and operational objectives. Strategic objectives of controlling may be: 1) documentation of work processes of the units technology park and organization of their improvement, and 2) the development and improvement of the performance indicator system of the ICT-technoparks, and 3) analysis of strategic trends of development of technopark in terms of its economy, state of funds, volume, structure, 4) cost-effectiveness of rendered services provided; 5) others.

Following can be underlined as part of the operational tasks of controlling of ICT-technopark: 1) operational analysis of financial and economic condition and results of

the main operations of technopark, 2) analysis of the results of activity of technopark residents 3) Reporting to management on results of works and progress indicators, and 4) a comparative analysis of technopark in relation to other technoparks. One of the essential elements of the system management subsystem technopark should be risk management [3].

Risk management in the technopark begins with the decision to create it. At the initial stage it is important to assess the orientation of technopark, understand its industrial structure, operation model and objectively investigate the positive and negative factors influencing the success and productivity of its work.

At this moment, there is a significant part of the risks emerging in association with the positioning of technopark, in particular: 1) the risks of market positioning, and 2) the risks of geographic positioning, and 3) political risks.

Talking about a functioning technology park as an object of property infrastructure, innovation center, innovation center, risk groups such as following emerge: 1) market risks, 2) financial risks, and 3) operational risks, and 4) the non-purpose use risks. Note that these categories of risks pose a significant complexity for many operating technology parks.

6. ICT-Technoparks Management Mechanisms

Mechanism or tools of technopark management – is a set of rules and procedures for decision-making of the OM that affect the behavior of managed entities - in particular, the information they provide and their chosen actions [8, 9].

Content of ICT-technopark management consists of processes of planning, organization, motivation and control necessary to achieve the objectives of the technopark. Generally the managing company is charged with management of technoparks property, as well as implementation of its organizational activities in accordance with the goals and objectives of a technology park. Managing companies (MC) of technology park concentrate the functions of current and future management of technopark, promote development of business residents, renders business services to them. It attracts and accommodates scientific - technical businesses on the territory of the ICT-technoparks, renders services and manages the technology park.

Let's note that, under the applicable law, the management company (MC) which carries the current strategic management and technology park, is the structural element of the ICT-technoparks that implements its system properties.

Managing company plays a key role in the development and management stage of ICT-technoparks. Funds received by the managing company as a result of its operations are exclusively used for conduction of events related to infrastructural development of the ICT-technoparks and support of high-tech enterprises - residents as they enter the

foreign and domestic markets [7, 14, 15].

Managing Company serves as a single operator for rendering services on the territory of the ICT-technoparks and as the chief organizer of interactions among residents, manages the area obtained from the sale of investment contracts, organizes the management of non-profit entities, as well as the activities of the special elements of innovation infrastructure.

ICT-technoparks management tasks consist of the following stages: 1) monitoring and analysis of the current state of the managing system, and 2) forecast of its development, and 3) goal-setting, and 4) planning, 5) distribution of functions and resources; 6) stimulation; 7) control and operational management; 8) Analysis of changes [8]. Let's note that, a set of control mechanisms is necessary for the effective management of any system, including a ICT-technoparks. It must be noted that nowadays management theory has gained significant experience in the development, research and implementation practice of the management mechanisms relevant throughout the management cycle, i.e., allowing implementing the functions of planning, organization, motivation and controlling [13].

7. Conclusion

Conducted analysis allows noting that, the key moments in the development of ICT-technoparks management mechanisms are taken into account by the above-mentioned factors and aspects. These management mechanisms will be improved continuously, depending on changing conditions in the economic environment. Therefore it is recommended to consider and use the indicated management aspects during development of different mechanisms of management systems of innovative structures in the field of high technologies.

References

- [1] A. A. Maltseva, G. A. Marzak, A. S. Nekrasova. Analysis of regulatory basics of operations of managing companies of technology parks in modern conditions. *J. Problem analysis and government-administration planning*. №2, 2011, pp. 109-116.
- [2] N. V. Pankova, L. N. Borisoglebskaya, E. S. Dibrayeva. Formation of innovative infrastructure of the region considering the specifications of development of the technology park area. *Vestnik the Leningrad State University*. 2011. N2, pp. 7-21.
- [3] R. M. Alguliyev, A. G. Aliyev, R. O. Shahverdiyeva. High Techno-Parks in the economy of Azerbaijan and their management problems. *ICIESM 2014: XI International Conference on Innovation, Entrepreneurship and Strategic Management*. Osaka, Japan. 2014. pp. 426-428.
- [4] N. I. Komkov, K. I. Lugovtsev, N. V. Yakunina. Information technology for the development and management of innovative projects. *J. Studies on Russian Economic Development*. 2012, Vol. 23, Issue 3, pp 293-302.
- [5] V. N. Frolov. Management institutions of technology parks,

- their role in management organization. *Vestnik of VU*. №72. 2010. pp. 16-22.
- [6] Chen Ming, Cui Bibo, and Man Haiyan. Theoretical analysis of the effect of management control method on enterprise innovation model selection. *2012 International Conference on Information Management, Innovation Management and Industrial Engineering*. pp. 192-194.
- [7] S. V. Krasnov, D. Y. Nikulin. Management of IT-park as a complex socio-economic system. *J. Volzhski University*. №18, 2011. pp. 30-36.
- [8] D. A. Novikov. Methodology of management – M.: Libro-Kom. Moscow 2011. pp-128.
- [9] Wang Huihui. Study on the Innovation of Industrial Park's Operating Mechanism. 2011 *IEEE*. pp. 240-243.
- [10] A. A. Bitlev. Improvement of the management system of infrastructural innovative entrepreneurship. *J. Economics of regional development*. 2011. pp. 444-450.
- [11] E. G. Russkova. Management of changes in the infrastructural support system of innovative activities. *J. Terra Economics*. №1, 2012. pp. S34-37.
- [12] T. V. Kolosova. Management of innovative development of an enterprise and competitiveness problems. *J. Problems of modern economics*. № (34), 2010. pp. 46-49.
- [13] V. K. Tribushnaya. Innovative infrastructure as a necessity of support of science-based entrepreneurship: technology parks and strategic management: *Monograph*. Izhevsk. 2011, pp. 240.
- [14] Erik Buisman, Hans Frost, Ayoe Hoff, Arantza Murillas, Jeffrey P. Powell. Evaluating Economic Efficiency of Innovative Management Regimes. *Comparative Evaluations of Innovative Fisheries Management*. 2009, pp 143-162.
- [15] Yong M. A, Shougui Luo. Management Innovation Capabilities Evaluation of Small and Medium-sized High-tech Enterprises in Shanghai. *2012 Fifth International Conference on Business Intelligence and Financial Engineering*. pp. 641-645.
- [16] Carlo Cambini, Michael R. Ward, Tobias Kretschmer. ICT and Innovation. *J. Information Economics and Policy*, Volume 25, Issue 3, September 2013, pp. 107-108.
- [17] Gunnar Eliasson. The nature of economic change and management in a new knowledge based information economy. *J. Information Economics and Policy*. Vol. 17, Issue 4, 2005, pp. 428–456.