

Commercialization Issues of ICT-directed Innovative Processes

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Abstract— The article justifies the relevance of commercialization issues of ICT-directed innovations and innovative processes. The objectives and tasks of these processes and hindering reasons are explained. International experience in organization of innovations commercialization is researched. Solution directions of commercialization problems of ICT-directed innovations are demonstrated. Stages of innovations commercialization, stimulation and main directions of strategy are analyzed.

Key words— *innovative processes; commercialization of ICT-directed innovations; national innovation system; stages of innovations commercialization*

I. INTRODUCTION

In modern days, economical growth of developed countries of the world is mainly related to development of innovation infrastructures. Formation of innovation policy is considered as of the main issues of development of economics in leading countries [1].

Living level in developed countries is more improving due to innovative development of economy. Solution of relevant problems such as determination of innovations based development directions in economical sphere, formation of human capital, effective use of intellectual potential, results of scientific-research works, production of competitive products, increasing of life level etc depends on innovations, application level of science and scientific knowledge.

Majority of countries, as well as Azerbaijan have recently accepted several program documents directed as stimulation of innovative development.

It is not accidental that, "National Strategy on Development of Science in 2009-2015 years" has set forth tasks such as development of innovation activity infrastructure, as well as enlargement of techno-parks, technological centers, business incubators networks. [2].

Rapid development of economy, increasing of social directions of new technologies, creation and utilization characteristics of new knowledge, technologies, products and services, characterize the national innovation system (NIS) as the innovative development basis of the country. For this reason, examination of commercialization issues of ICT-directed innovative processes, as well as innovations is considered as one of the important and relevant issues.

II. OBJECTIVES AND TASKS OF COMMERCIALIZATION OF ICT-DIRECTED INNOVATIONS

It is possible to provide multiple definitions for ICT-directed innovation and innovation processes. But, especially two aspects must be noted here: 1) innovation is a principally newly created commodity or service in any case; 2) innovation must be useful to society and be commercially appointed for this reason, i.e. must be sellable as commodity or service.

Innovation process is carried out in mutual relation to following economical factors and participants:

Designers and authors of innovations – physical persons, collectives, organizations;

Owners of innovations – physical persons and different organizationally-legally formed juridical people;

Intermediaries in process of application of innovations and formation of intellectual property rights for them – venture capital funds, information or innovation centers;

Consulting firms, patent-license services;

Innovation producers specializing in certain activity – techno-centers, innovation institutions in special economical zones, scientific organizations, techno-parks;

State in innovation activity regulator role.

Depending on these, reviewed process is divided in following significant stages functionally: 1) research and processing stage; 2) stage of transfer of innovations to production, management, social etc spheres; 3) implementation and utilization of innovations; and 4) product production stage based on obtaining ownership profit.

Commercialization in this process means a management process of resource allocation and their expenditure including evaluation and transfer of complete and appropriated results of innovation activity in industrial environment. Unlike past planned-directive economy where financing, management of innovations and transfer of results were carried out separately, commercializing processes in market environment unites those functions. The main objective here is to obtain positive commercial effect, at least direct it to cover its own expenses [3].

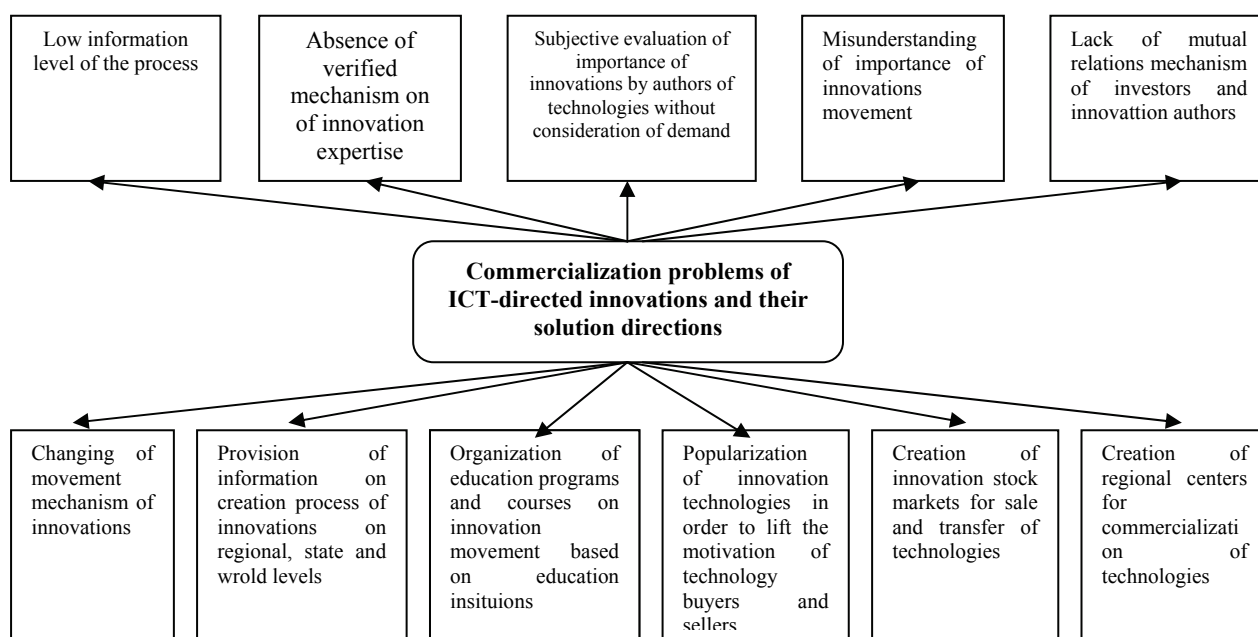


Figure 1. Solution directions of commercialization problems of ICT-directed innovations

To a wide extent, commercialization process is conversion of ideas to money. If formerly, "idea-money-effect", i.e. conversion of ideas to money scheme was working, nowadays "money-idea-money" scheme must be carried out to support innovations in market environment. For this reason, lack of commercialization and market infrastructure provision technologies for reproduction of technologies and innovations in accordance with "money-demand-knowledge (idea)-meeting requirements-money" scheme is the reason for subsidizing innovation process nowadays.

Problems in reinforcement field of commercialization process of technologies reveal itself in agreement of decisions in economical, legal and organizational spheres. Generally, it would be efficient to use the decision making model on management of technology movement displacement by all stages of life cycle as the basis of management mechanism of innovation processes, as well as commercialization. Such model considers patenting, creation of companies bringing gaining profit from its sale or its utilization during

production. Overall, commercialization of ICT-directed innovations – is an activity type that sells innovation products and services as a result of innovation processes or assists the sale. During the process, scientific results or technological project is carried out through gaining commercial effect.

Commercialization problem of ICT-directed innovation processes is one of the most important problems of formation of innovation economy which includes a great number of unsolved issues.

III. COMMERCIALIZATION PROBLEMS OF ICT-DIRECTED INNOVATIVE PROCESSES

Scientific examination of existing processes in innovation commercialization field, demonstrate that, following reasons

extra profit, financing, staffing, marketing, service, world market entry, and technology export through funds, banks, government orders etc. As a rule, three main forms of commercialized processes are noted: commercialization of innovations, technologic transfer, and innovation diffusion. Despite this, usually these three concepts are considered as synonymous definitions of the same process, and intend to comment the same process from different aspects.

Commercialization of technologies is a conversion process of results of scientific-technical activity to commodity and their effective realization. Currently, the commercialization term is not used in legislation of come countries. This process is replaced with attraction of intellectual property to economical turnover.

In spite of this, the essence of commercialization as the most important element of innovation process remains unchanged. Commercialization of innovation idea means

hinder implementation of above-mentioned processes [4]; difficulties in development of scientifically justified policy in sale, procurement and utilization field of technologies containing innovations; difficulties of extracting and separation of innovations from multiple solutions forming the objective and substance of the object, process and material;

Difficulties of evaluation of new techniques, technology and materials for their re-production from innovation importance point of view after determining commercial sale capabilities.

Difficulties related to confidentiality of innovations and factors hindering scientific-technical progress;

Importance of implementation of innovations both in and out of the country only in accordance with license agreements;

Necessity of interest provision of innovation institutions and authors in development, industrial and commercial realization of innovations.

Examination of sources related to innovations demonstrate that classically structured innovation process consists of fundamental researches (FR), applied researches (AR), experimental-constructor works (ECW), market application, series manufacturing, maturity and decline stages. Commercialization of innovations is shown as a separate process in this model of innovation life cycle

IV. INTERNATIONAL EXPERIENCE IN ORGANIZATION OF COMMERCIALIZATION OF ICT-DIRECTED INNOVATIONS

Innovation commercialization process has many difficulties. Uppermost, this concerns financial, organizational, and normative-legal maintenance of innovation commercialization [5]. Study and utilization of experience of several western countries helps to improve the innovations commercialization process and develop innovative economy.

Let's note that, the road from an idea to a commodity, i.e. commercialization way and process has been long-term and difficult at all times and places.

It is now required to pass it fast. Otherwise, it is impossible to achieve in current intense competitiveness and globalization environment.

V. SOLUTION DIRECTIONS OF ICT-DIRECTED INNOVATIONS COMMERCIALIZATION PROBLEMS

Lack of sufficient information content of entire development process of innovations delays the commercialization process of innovation projects. It is difficult to describe the innovation technologies a required. This hinders achievement of strategically objectives.

For this reason, preparation criteria of commercialization of technologies on primary expertise level can be briefly commented as below [6]:

Researchers, projectors team must create a normal innovation company;

Innovation Company must own intellectual property protected in the form of international patents.

Within the framework of technologies commercialization project, equipment, method, technology, objects, materials etc must have a prototype.

There must be a documental proof of prototypes (photo, video);

Technology must surpass the existing development level of techniques and economy not in several percentage points, but in several times.

It is desirable to own a small series manufacturing or experimental-industrial application works;

Innovations Company must actively cooperate with technologies commercialization centers and other similar

organizations, operatively respond to all asked questions, and are ready to demonstrate technology.

Owners of results of ETTKI and technologies created based on them must comprehend and accept the real cooperation forms which hold an important place within technologies commercialization projects.

Thus, international level of commercialization of innovation technologies requires the innovator to sense the commercialization process, find investments to produce an experimental sample of the product, to have capabilities to present, advertise and promote its new technology. Some information about commercialization problems and their solution directions during this process are presented in figure 2.

VI. COMMERCIALIZATION STAGES OF ICT-DIRECTED INNOVATIONS

In order to clearly understand commercialization of innovations production, it is necessary to note innovation product (technical wares, technology and systems of different assignments) production process consisting of 4 consequent stages: 1) Completion of ETTKI, 2) experimental production, 3) small series manufacturing, 4) industrial manufacturing. In this case, each stage corresponds to a certain condition of the product: experimental sample, experimental party, series or industrial manufacturing. Commercialization process at different stages of manufacturing of innovation product is provided in figure 1.

Provision of commercialization in any out of 4 stages of innovation manufacturing requires conditions that consider correct relation (correlation) of innovation policy and priorities of its objectives.

Overall, commercialization of scientific innovation consists of four stages: 1) fundamental researches examination stage; 2) applied researches examination stage; 3) marketing researches examination stage; 4) innovations market application results examination stage.

Innovations commercialization model includes following elements, block, stage and data [7]:

1) fundamental researches (FR) data, 2) Results of FR examination, 3) applied researches (AR) data; 4) results of AR examination; 5) experimental-constructor works (ECW) data; 6) Results of ECW examination, 7) market directed application data, 8) application examination results, 9) application results' examination, 10) evaluation of commercialization effectiveness, 11) evaluation of marketing research and competitively, 12) product demonstration, 13) examination block of fundamental researches, 14) idea refusal stage, 15) invention refusal stage, 16) product refusal stage etc (scheme 1).

Commercialization of innovation usually must start at the point of fundamental research conduction. This allows determining perspective innovations at primary stage.

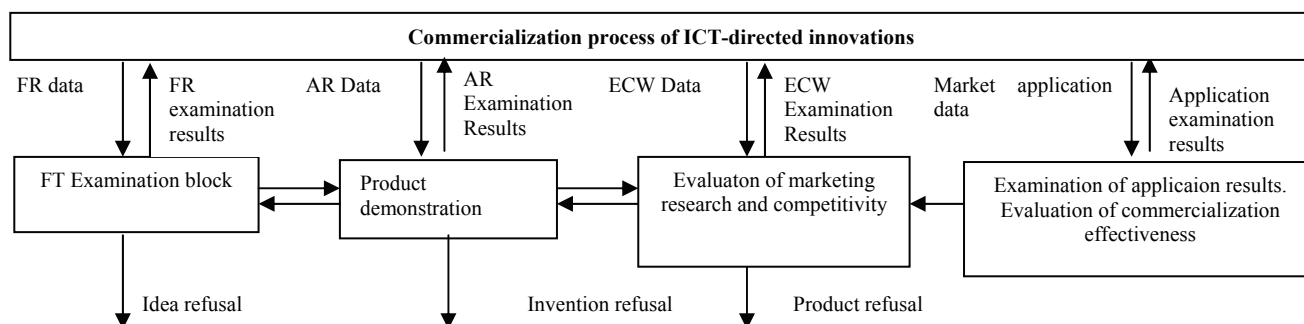


Figure 2. Schematic model of commercialization of ICT-directed innovations

VII. MAIN DIRECTIONS OF STIMULATIONS OF COMMERCIALIZATION OF INNOVATIONS

Examination of approaches existing in this field, demonstrate that main directions of stimulation of commercialization of scientific innovation are as following [3]:

- Provision of state support priority to increase the expenses on development of science and scientific technologies to a normal level.
- Improvement of utilization of field innovation funds and formations for provision and commercialization of application of innovations;
- Formation of normative basis for venture financing system operations of innovative projects;
- Development of organization and operation of small innovation companies by forming effective conditions;
- Aiding to provide financial support to parent and invention activities, protect intellectual property and rights;
- Improvement of stimulation system of innovation products creation and utilization processes.

It must be noted that, changes can be made in local Tax Code in order to stimulate the commercialization process of innovation like scientific-technical activity results. This can be carried out in order to form favorable conditions for financing of new products manufacturing or improving produced products.

VIII. MAIN DIRECTIONS OF COMMERCIALIZATION STRATEGY OF ICT-DIRECTED INNOVATIONS

Conducted examinations demonstrate that, following can be included as main directions of commercialization strategy of innovations [4]:

- Change of development mechanism of innovations;
- Informatization of innovation creation process on regional, state and world levels;
- Organization of educational programs and courses on development of innovations on the base of education institutions;
- Popularization of innovation technologies in order to increase the motivation of technology sellers and buyers;

- Creation of technology stock markets for sale and transfer of innovations;
- Creation of regional centers of commercialization of technologies dealing with organizational issues.
- Direct management of administration, monitoring, evaluation of activities related to development and innovations and sale of innovations.

Implementation of these directions must assist in development and sale of innovation technologies. In its turn, this will increase the effectiveness of innovation commercialization process.

IX. THE RESULT

It must be noted that, there are several approaches to formation of commercialization of ICT-directed innovative processes and several factors complicating their realization. It is advisable to benefit from experience of leading counties in this business. It is possible to achieve increasing of effectiveness in this field by using solution means of exposed problems. For this reason, we reckon that consideration of factors, proposals and recommendations noted at relevant stages and processes of ICT-directed innovation operations will positively affect the effectiveness of said process.

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