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DEVELOPMENT OF THE INNOVATIVE TECHNOLOGIES TRANSFER CONCEPTUAL MODEL

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Development of innovative economy in Russia is analyzed in the article, the direction of the effective dissemination of innovation is considered here. We present the concept of innovation active enterprises, the definition of its development potential. The techniques of the transfer of innovative technologies, its conceptual model and, as an option, transfer pricing using probabilistic and expertise.

Key words: Innovation activity, Innovative enterprises, Transfers, Innovative technologies, Model implementation, Development potential, Commercialization, Transfer price

INTRODUCTION

Purposeful management of the commercial use of the results of science and technology has fundamental impact on firm performance worldwide, so the development of the Russian economy should be aimed at the development and creation of a mechanism that would help businesses move to an innovative path of development. One of the main priorities of this development has to be a mechanism for effective dissemination of innovation of all kinds: as a technology, product, and organizational management. That is why, problems, which associated with the management of the whole chain of the innovation process - from concept to technology transfer, acquire particular relevance at this stage of economic development in the Russian Federation. Technology transfer - the process of transfer (sale, exchange) of properly structured with sufficient fullness of knowledge, experience, skills, and of industrial property rights to them from the source technology to the buyer, i.e. technology transfer is an economic category.

METHODOLOGY

The commercialization of innovative technologies – is a practical use of innovations, accompanied by its access to the market [01]. This concept involves the use of binding commercial information on innovation, that is, use with optional removing benefits. Transfer or transmission of information on innovative technologies, and can be carried out not for commercial purposes. Technology transfer is included in the innovation process, which is a reception and commercialization of inventions, new technologies, products and services, making organizational and technical, economic, social or otherwise, and other results of intellectual activity. Technology transfer allows you to bring development to the state of innovation, a successful implementation of innovations to disseminate innovation, and go temporarily inaccessible markets, increase competitiveness, and others.

Depending on the stage of the innovation process, which is the technology (innovation, innovation), there are three main points of technology transfer:

- from stage to stage search technology to the stage of testing technology in the laboratory;
- from the stage of testing technology to its optimization and scale process;
- from the stage of small-scale production to full-scale.[09]

Technology transfer has a number of features, chief among them are:

1. Features of the technology as the transmission of the object. The spread of technology, like any innovation, carried out in stages. At the initial stage of its existence, the technology can be unique, which ensures its owner a privileged position in that case on the basis

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of this technology to create a new competitive product, or it can achieve significant savings on production costs. This prompts the owner hinder its free flow and protect both intellectual (industrial) property, as well as special conditions of contracts. In addition, at the initial stage of the technology is often not regulated and requires from both the owner and the potential buyer of the additional costs for its transfer and adaptation, which is also an obstacle to the free circulation. [05].

2. Technology transfer is usually associated with the transfer of the rights to its use. In this case the transferor retains the right as an independent use of the technology and its transfer to other interested companies.
3. Technology transfer is usually accompanied by training, which is immaterial form of the transfer of implicit knowledge.
4. Participation of the transmitting side in the process of technology transfer is to find potential buyers, attracting intermediaries, choosing the form of a license agreement, providing training, advice, setting up equipment, leasing of key media technology, and often in joint R&D by the buyer to bring the technology to the stage of industrial use or for its further improvement.

These features make it possible to conclude that technology transfer is not a one-time deal. It requires long-term cooperation of the transmitting and receiving sides, with the participation of various intermediaries and combines a combination of alienable and inalienable forms. Despite the fact that technology transfer is usually carried out on a commercial basis, it is almost always present and non-commercial aspects of (one-time counseling, free publications, joint research, personal connections and relations developing between workers, etc.).

Each innovative enterprises, produces for itself a specific plan of action in the direction of technology transfer. Innovative-active enterprises - is a company that has intellectual property in its asset, to develop and introduce new or improved products (works, services), processes corresponding to the scorecard, relating it to the innovation that meets the characteristics of activity and self-performing technology transfer (later-IAE, rus.-ИАП). [06] The proposed implementation model of the transfer of innovative technologies, represents the transfer of knowledge, experience and information in order to promote faster technology stages of the innovation process, its rapid transformation into innovation and more efficient use. This process means the formation of a specific course of action to be followed. The ultimate goal of this model is an agreement on one or more technology transfer on certain conditions.

The model consists of several stages. Preparatory stage can be present more detailed. It consists of three steps i.e. iterative prossess.

Stage 1. Step 1. Market research of scientific and technological products in the context of the markets and segments, in which innovative enterprises are represented, as well as those where it wants to be. This study is made to identify innovations that already exist and are used by other companies, including those technologies that can be acquired now. The study can be carried out by analyzing the patent literature. An important question is about the sources of information on technology - innovations, development, innovation, processes, services, courses.

For the purposes of the invention, an objective evaluation is necessary to know not only its advantages compared with the previously known technical solutions, but also disadvantages compared with later potential technical solutions. If it is found at least one such patent, the product is on the patent clear for this country and for the organization of its production, sales, advertising, any other action related to this product requires a license from the patent holder. The first step prepares the information for further action: collected and analyzed information on available technologies, not only from competing businesses, but others as well as available in other markets in which innovation and the company plans to actively positioned. The result of this step is the definition of a range of products and technologies that may be of interest to the enterprise, i.e. it can be purchased or become the object of sale. In addition, it has formed a certain range of companies - potential partners who might want to buy these technologies or have the proper technology.

Step 2. Study the potential development of innovation-active enterprise.

The analysis procedure of the development potential of innovation active enterprises in the definition of some indicators, values, preferably in the dynamics that reflect the possibilities of the

company to implement development [6]. We may stay at the five main components of the development potential of IAE (if necessary they can be completed):

- the financial component;
- hroduction;
- business;
- management;
- a component that characterizes research and development (R&D).

In addition, the evaluation of the development potential reveals the need to acquire some of the technologies, equipment and information. Based on the scorecards of all components of the development potential of its proposed comprehensive assessment:

$$K_{n.p.} = \sum_{i=1}^{n} k_i Y_i$$

where $K_{n.p.}$ - comprehensive assessment development potential innovation-active enterprise;
n - The number of potential components included in the comprehensive;
k_i- Boost factors influence the i-th component of development potential:

$$\sum_{i=1}^{n} k_i = 1$$

Y_i - relative indicators characterized each i-th component of the building development of IAE.[07]

Comparison of the characteristics of periods allows us to formulate some conclusions about the need to make certain decisions and actions in the field of innovation enterprise.

Step 3. Research of innovative climate [02].

Analysis of the development potential of the IAE (ИАП) can produce a variety of results, for example, reveal the urgent need for the acquisition of technology. In this case, the analyze of innovation climate is not superfluous, i.e. external factors of the transaction on the transfer, namely, the analyze of social infrastructure and communications sphere, natural and geographical conditions, technological, scientific, technical, political and legal sphere, strategic areas of management and, finally, the market labor.

If detected approximate range of technologies and innovations (and the companies that own them) that are interested in IAE, then comes the turn of the second stage of technology transfer.

Stage 2. Selection of technology transfer. It includes the technological audit, the definition of a set of technologies for the transmission range of each form of technology transfer. Finally, stage 3 - technology assessment and making an agreements. It includes the definition of partner enterprises, the valuation of technology transfer and the expected results and, as a result, the conclusion of the license agreement.

Conceptual model for the implementation of technology transfer is presented on Figure 1. The developed model is a tool that can use any innovative enterprises. Serial passage of these stages and steps allow to determine existing technologies and those that can be transferred to other enterprises or bought from outside. In implementing this model, the method of expert assessments and analysis of the cash flows of innovation active enterprises with the help of the calculation of indicators characterizing innovation projects are used in this research[6]. According to this model indicator on innovative enterprises “Omega” for the implementation of the software were calculated. Four options have been considered a transfer of an innovative product (Table 1):

- the lack of action on a transfer;
- sale of licenses for the reproduction and use of the utility model;
- the purchase of software licenses;
- sale of licenses for the reproduction and use of the utility model and the purchase of software licenses.

The calculations are carried out in accordance with the model for each option separately.

Table 1: Summary table of the results of calculations on the four options for technology transfer IAP “Omega”

Option	NPV (th.rub.)	PI
Lack of action to transfer	6531,77	47,65
Sale of licenses for the reproduction and use of utility model	7145,08	48,62
Purchasing software licenses	10088,76	40,53
Sale of licenses for the reproduction and use of the utility model and the purchase of software licenses	10688,6	49,03

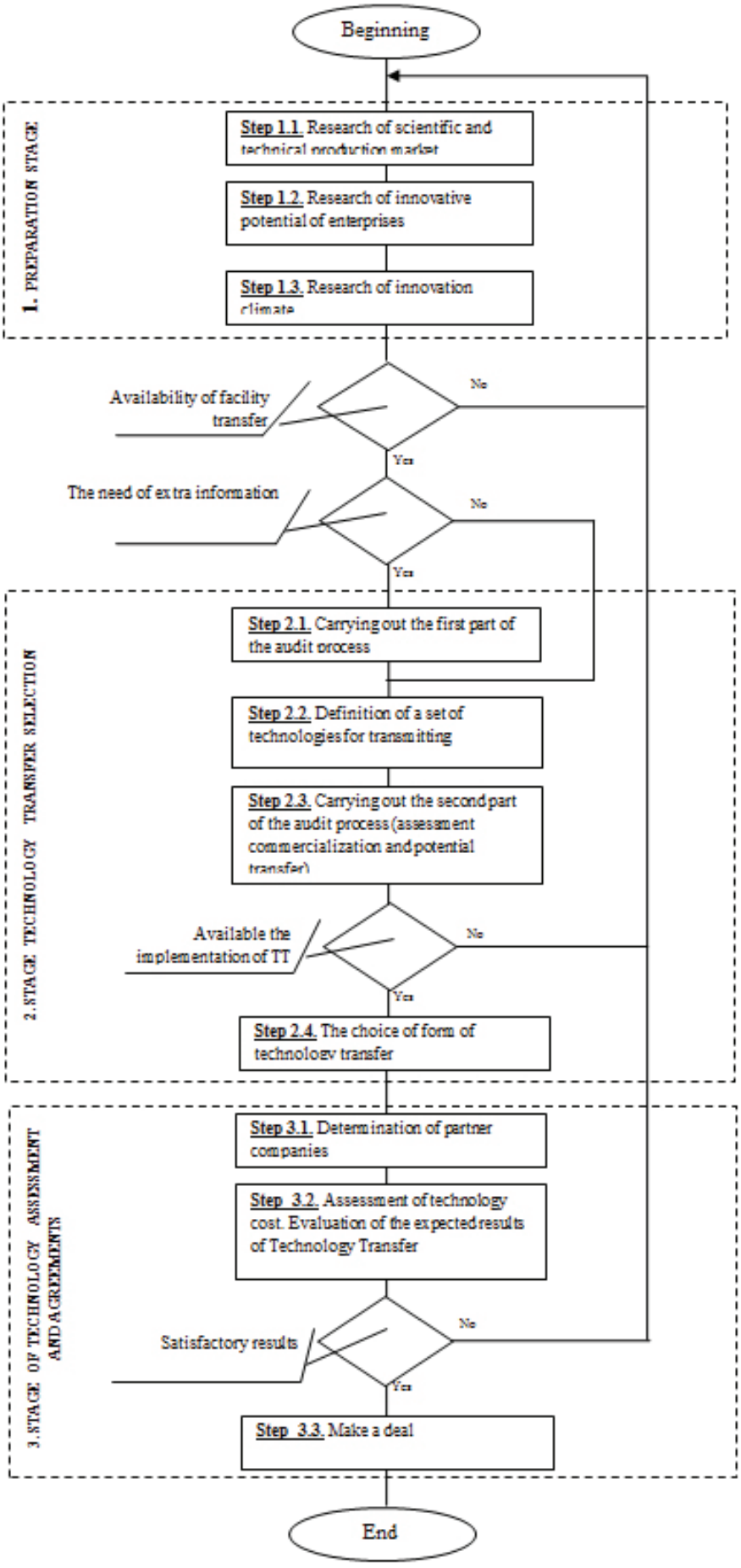

Figure 1: Model of the implementation of innovative technologies transfer

RESULTS AND DISCUSSION

Analyzing the results of all possible options in view of the current innovation projects, we may make following conclusions. If we evaluate the projects on the absolute value of NPV, it is preferred the fourth option, which gives the greatest importance. At the same time it can be said that any option of technology transfer is better than the absence of any action. But if we take into account the relative index and the index of profitability, it appears that the most disadvantageous third option is to providing only the purchase of software licenses. This should force the management to think about how such a transfer affects the volume of production and sales, product quality, and others. Perhaps, the staff does not have the necessary knowledge to make full use of this technology or the predicted values are too low, and should be corrected. The best two performance indicator is given by fourth option. The values of the index of profitability for the second (sale of licenses) and the fourth (the simultaneous implementation of the sale and purchase of technology) variants are close enough that stresses the importance of measures to transfer the license.

But as the company needs software leaders IAE "Omega" take a decision to carry out both acts of transfer of technology. Knowing the sequence of actions when having the task of the transfer, the company can reduce the time and resources that ensures the success of its implementation. The model is universal; it will benefit both large and small innovative enterprises, modifying the audit procedure and adjusting the methods selected for the assessment of technology transfer. The ultimate effectiveness of the innovation process directly related to the "involvement" of the new knowledge into economic practice. The final stage of the production activity of innovation active enterprises, as already mentioned, is the commercialization of research. That is necessary to determine the price of technology transfer. This may be done (for example) by making price for innovative product transfer positioning game with a random factor ("outdoors"). Suppose that the IAE plans to commercialize its own innovative product, such as new technology or complex software. It is assumed that the value of cost components due to transfer of the product are determined (Table 2) [08].

Table 2: The composition of the costs of the transfer IAE innovative product (raw data)

The costs of transfer	The amount mln. / Product
Marketing research	0,5
R & D, prototyping, test marketing, and its completion of the test results	1,0
Advertising campaign	0,3
Transaction	0,2
Total	2,0

It follows from the results of market research market analysis we know that with probability 0.2 competition in the market are similar in scope of innovative products will be. It was also found that selling prices identical diversion innovative products have the following conditional probabilities (Table. 3).

Table 3: The probability distribution of the selling price of a transfer (the state of 'nature')

Price Transfer, mln rub. / Product	6,5	7.0	7,5	8,0
Conditional probability	0,2	0,4	0,3	0,1

Innovative enterprises need to decide on the feasibility of the transfer and the price at which it can be implemented, that is, in terms of positional play - choose a strategy that maximizes the expected profit. Thus IAE must sequentially take two solutions, i.e. to determine, firstly, - economically expedient or inexpedient transfer of this innovative product, and, secondly, at what cost to implement the transfer: 6.5; 7.0; 7.5 or 8.0 mln. / Product. After the accepting these decisions IAE will monitor how these uncertainties are resolved by the actions of "nature" (the market reaction). Since the probability distribution of the state of "nature" (the state of the market) is known (Table. 3), the optimality criterion can be taken as the expectation of winning, for example, profit v. Moreover, if the IAE intends to implement its innovative product at the price of C, it expected

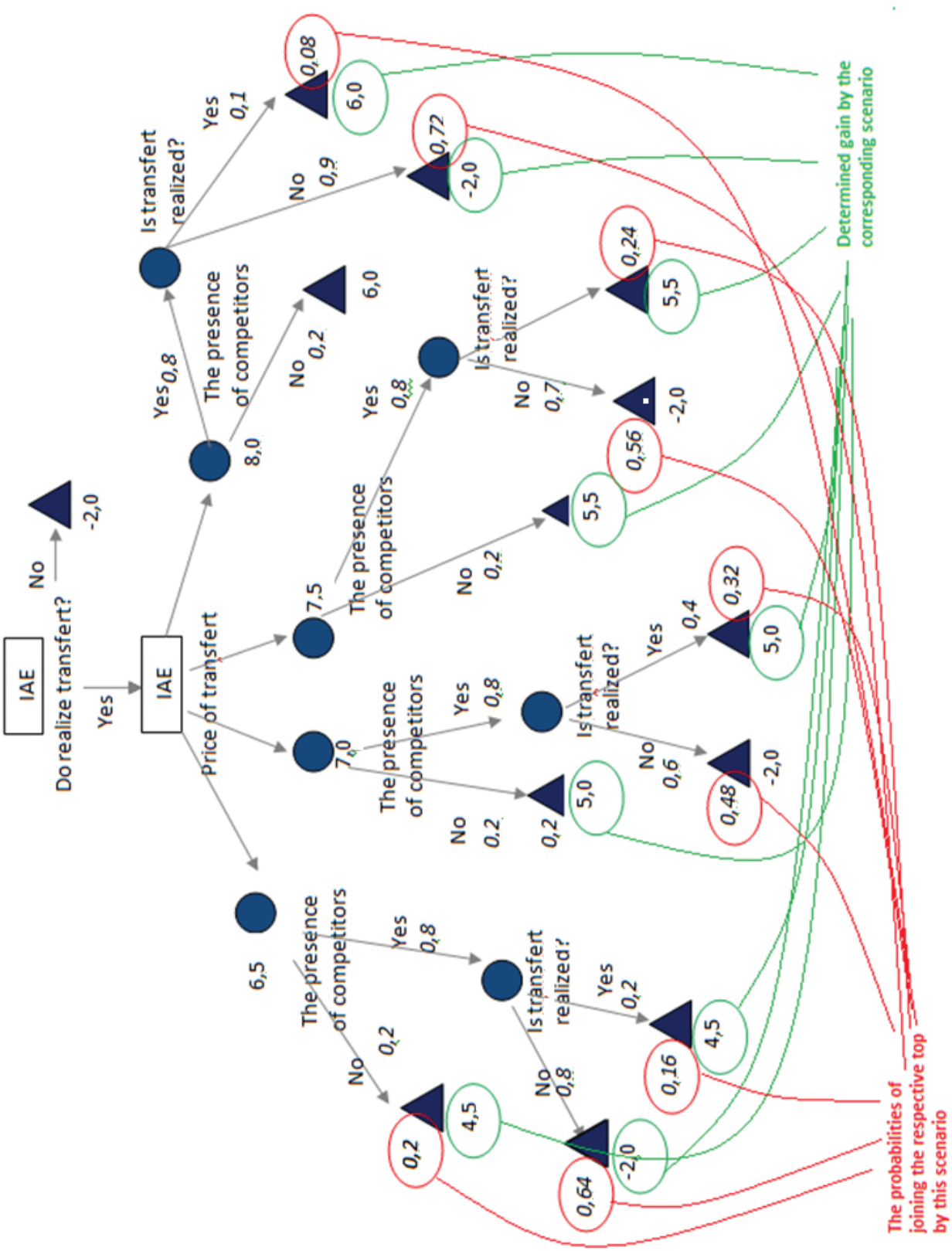

Figure 2: Tree game, showing all possible alternative solutions IAP

earnings of
v = C – S,
where S - cost of transfer (Table. 2).
For the given conditions of transfer it might be composed of the following game tree that displays all the alternatives possible solutions IAE and their expected results (Figure 2).[04]. For purposes of this tree topology of each of its top end, marked triangle identified by two values: the value of profits IAE corresponding to the current market situation, and the probability of its existence, that is coming to this summit. Probably corresponds to the branches emanating from the vertex form a complete group of events. Therefore, the sum of the probabilities for all branches emanating from each vertex is equal to one. Optimal for IAE solution can be found by "reverse" [03, 07].

Step 1. For each vertex of the tree of the game (by circle) is determined by the expectation of winning all the alternatives emanating from this vertex. At a price of 6.5 million transfer rubles. / Products: for the last vertex
v_1 = 0,2 (6,5 - 2,0) + 0,8 (0 - 2.0) = - 0.7 million rubles / product;
for the previous vertex
v_1 * = 0,8 • (- 0,7) + 0,2 • 4,5 = 0,34.
With the price of a transfer of 7.0 million rubles. / Product:
v_2 = 0,4 (7,0 - 2,0) + 0,6 (-2,0) = 0,8;
v_2 * = 0,8 • 0,8 + 0,2 • 5,0 = 1,64.
With the price of a transfer of 7.5 million rubles. / Product:
v_3 = 0,3 (7,5 - 2,0) + 0,7 (-2,0) = 0,25;
v_3* = 0.8 x 0.25 + 0.2 x 5.5 = 1.3.
With the price of a transfer of 8.0 million rubles. / Product:
v_4 = 0,1 • 6,0 + 0,9 (-2,0) = - 1,2;
v_4 * = 0,8 • (- 1,2) + 0,2 • 6,0 = 0,24.

Step 2. The optimal solution will fit
max (0,34; 1,64; 1,3; 0,24) = 1,64.

Therefore, the maximum profit of the IAE, which is equal to 1.64 million rubles, can be obtained from the transfer of its innovative product at the price of 7.0 million rubles.

Thus, using the model given in the enterprise in the first place, will be able to decide what action to technology transfer should be administered. Secondly, the game-theoretic approach to setting transfer prices could contribute to the resolution of uncertain market conditions when it is impossible to advance with a certain degree of accuracy to evaluate the situation on the market of innovations, designers put them out to tender. Both provisions can significantly speed up the promotion of development, innovations and technologies through the stages of the innovation process.

Thus, the ultimate effectiveness of the innovation process directly related to the "involvement" of the new knowledge into economic practice. From this point of view in the theory of innovation highlighted the concept of "technology transfer" and the diffusion of innovation. The final stage of the production activity of innovation-active enterprises is the commercialization of research. Technology commercialization is an element of technology transfer. Transfer of technology (technology transfer) can be defined as a system of economic relations, through which the technology developed in one innovative enterprises, transformed into a commercial product or process used by another of innovative active enterprise. Transfer of innovative technologies designed to promote faster development, innovations and technologies through the stages of the innovation process and qualitative transformation in innovation.

CONCLUSION

Designed by the conceptual logic model for technology transfer to innovative enterprises it allows to clearly identify the existing technologies and those who are potentially the object of transfer. Knowing the sequence of actions when the task of the transfer, the company can reduce the time and resources that ensures the success of its implementation. Thus, for the country's economic development is necessary to boost the pace of the transfer of advanced technologies, as well as raising funds for the development of innovation.

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