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INTELLECTUAL PROPERTY ASSET ASSESSMENT METHODS

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Abstract

In current conditions, one of the most important factors of the competitive capacity of an enterprise is its intellectual resources. Russian business integration in international economic processes has to activate its intellectual resources for using competitive advantages. Managers of modern enterprises are aware of the importance of innovation activities for improving competitive capacity of enterprises. Innovation activities of enterprises are important in current conditions. Innovation products are intellectual resources of businesses, intangible assets (IA) of enterprises. Effective intellectual property asset management requires developing new methods for assessing the market value of intellectual property objects. Lack of standard methods for calculating license prices confirms the view that the cost of a product is as much as its market price. It underlines the need for developing universal IPA assessment methods. The article critically analyzes traditional assessment methods for intellectual property assets applied in current market conditions. The income-based method can be applied if the certainty level for predicted demand is high. The cost-based method is applied to determine the value of intellectual property objects designed to improve efficiency of internal industrial processes of the enterprise.. An optimum IPA assessment method is important for developing competitive advantages of enterprises and the national economic system, improving its innovation climate.

1. Introduction

At the current stage of the world economy development, in conditions of the sharpest world market competition, the issue of improving competitive capacity of enterprises is crucial. Russian business integrating in international economic processes has to activate its intellectual resources for using competitive advantages. Innovation activities of enterprises are important in current conditions. Manufacturing of innovation products and use of innovation management achievements allow an enterprise to be a leader in the industry, create new markets and manufacture new products implementing key principles of the "new" economy. Managers of modern enterprises are aware of the importance of innovation activities for improving competitive capacity of enterprises (Gargate & Momaya, 2018).

According to the most popular approach (The sixth version of the Frascati Manual, 2013), innovation is a final result of creative activities – a new product or technology. As for new products, purchasing of an innovation product means purchasing of a material thing or object, information about the product and its manufacturing characteristics. Thus, innovation is an intellectual product of the enterprise which determines the nature of innovation process management. Innovation products are intellectual resources of businesses, intangible assets (IA) of enterprises.

Intangible, wear-free, inexhaustible nature of intellectual property assets, which can be produced in any volumes, are important for efficient innovation process management. Studies (Leber & Urazova, 2014), (Azgaldov & Kostin, 2010), (CSh Ma S., 2013) say that intellectual property asset (IPA) management and legal protection are crucial issues in Russia and abroad.

2. Problem Statement

It is well known that the main technology transfer method is the distribution of intellectual property assets by trading licenses. License purchase and accounting as an IA as well as IPA purchasing require calculation of the IPA's value. The IPA's value is a fair market value. Lack of standard methods for calculating license prices confirms the view that the cost of a product is as much as its market price. It underlines the need for developing universal IPA assessment methods. It is more crucial for technology commercialization, when there is market demand for IPAs, than for using innovation products for internal activities of enterprises.

3. Research Questions

License pricing is negotiated by sellers and purchasers. A licensor carries out initial license value calculation and informs a licensee about the price calculated. The licensee evaluates market capacity, consults experts and negotiates a final value with the licensor.

When assessing innovation products, it is necessary to take into account price forming factors. The method recommendations (Method guidelines for calculation of the market value of intellectual property assets. (2002)) say that the following principles should be observed when determining the IPA's value: a demand and supply principle (IPA's value depends on market demand and supply and market competition forms); a utility principle (the IPA's value depends on the ability of the object to satisfy specific needs); an expectation principle (the IPA's value depends on the expected amount, term and probability of acquisition of income which can be acquired if the asset is used in the most efficient way); a change principle (the

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IPA's value changes in time and is determined at the specific date; a substitution principle (the IPA's value cannot exceed potential expenses on purchasing of an object with equivalent utility value); an external impact principle (the IPA's value depends on external factors, on the degree of market infrastructure development, international and national legislation, government intellectual property policies, etc.); an efficiency use principle (the IPA's value is based on the most probable use of an object which is economically reasonable, meets legislative requirements and financially possible) (Method guidelines for calculation of the market value of intellectual property assets. (2002)).

Thus, the market value of innovation objects is influenced by the following factors: IPA utilization, including peculiarities of an industry; possible market capacity and market share; manufacturing and marketing costs; investment amount and structure, risks of development and utilization of intellectual property assets in different industries; a commercial innovation product development stage; legal protection possibility and degree; the volume of rights transferred and other contractual terms; remuneration payment methods and other factors.

4. Purpose of the Study

The present study aims to critically analyze license value assessment methods.

5. Research Methods

There are different license value assessment methods which are developed in theoretical researches and used in business practice (Leontyev & Mamadzhanova, 2012; Petrikiva, Isaeva & Ovsyannikova, 2015; Shpilevskaya & Medvedeva, 2011; Rumyantsev, 2007). Regulatory acts of the Ministry of Property Relations of the Russian Federation can be used when applying existing assessment methods for intellectual property objects. There are three main IPA assessment methods presented in Table 01.

Table 01. Main IPA assessment methods: summary and applications

| Method	Summary	Application
Cost-based	Calculation of expected revenues * derived from the use of an IPA	Given that revenues derived from the use are possible
Income-based	Calculation of IPA replacement costs	Given that the IPA can be replaced
Comparative	Comparison of the IPA's value with the value of equivalent objects	By adjusting prices of equivalent objects to smooth differences from the price of the IPA assessed

* Revenues derived from the use of an IPA is a difference between money receipts and money payment for a certain period.

The mechanism of using these methods was described in (Asaul, Karpov, Perevjazkin & Starovoitov, 2008). The total IPA's value is based on the results of all the methods. The total value assessment is used to:

- identify purposes and results of IPA assessment;

- describe allowances, restrictions and features of the object;

- describe factors which are significant for evaluating and interpreting assessment results;

- define innovation products as objects under assessment (a utilization method, technical, technological, functional and economic characteristics);

- assess the proper use of the object;

- describe the nature of innovation products manufactured using the object under assessment;

- monitor analysis results for the market of products manufactured using the innovation product;

- describe sources of revenues derived for the use of the object, etc. (Asaul, et al., 2008).

Selection of IPA assessment methods also depends on assessment goals. The selection process is presented in Figure 01.
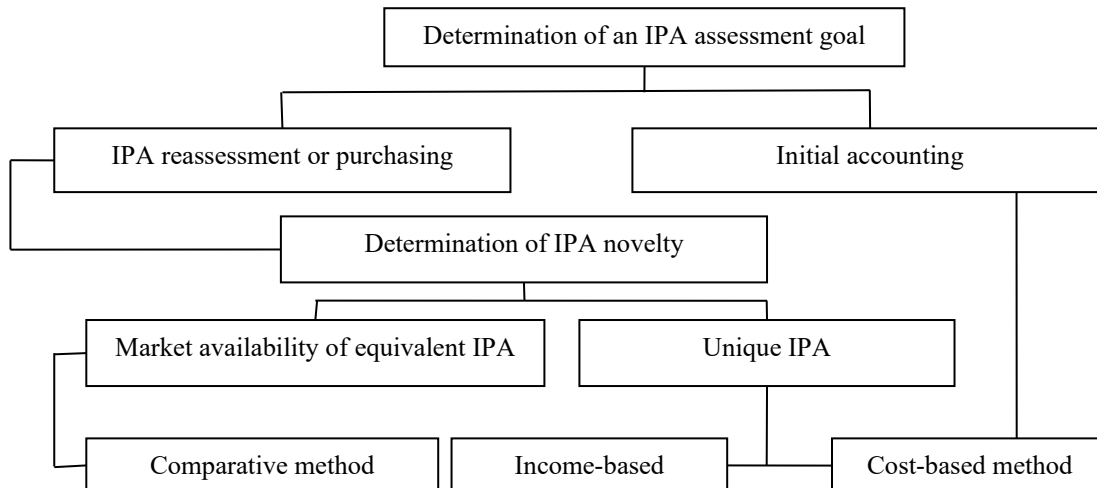
Figure 01. Selection of an IPA assessment method

First of all, it is important to determine an IPA assessment goal. If the goal is initial accounting, a cost-based method should be applied. Otherwise, this method can require determination of an intellectual property object novelty level. For assessing intellectual property objects having market analogues, it is reasonable to use a comparative method. For assessing unique intellectual property objects, it is reasonable to use income or cost-based methods. The first one can be applied when it is possible to determine potential benefits of an intellectual resource owner. The second one can be applied for intellectual property objects generating indirect profit.

A license price is calculated using an efficient IPA assessment method. License price calculation using the methods described results from the need to assess revenues derived from the use of a licensed object, which are shared between the licensor and the licensee. The license price involves licensee's payment to the licensor. Based on this price, the licensee agrees to purchase intellectual property rights and the licensor agrees to transfer these rights for temporary or permanent use. The income method is based on the predicted amount of money receipts from the use of an IPA. These are lumpsums or royalty payments. Except for additional revenues, the licensee can reduce production and marketing costs, increase sales volume, reduce expenses on purchasing the rights to use intellectual property objects, improve the temporal structure of the financial flow from the use of innovation products, etc. The value of revenues derived from the use of innovation products is assessed by comparing money receipts and payment (taking into account risks and temporal structure) in case the licensee uses the innovation product, and money receipts and

payment (taking into account risks and temporal structure) in case the licensee does not use the innovation product. The value is calculated using different methods described in (Urazova, 2014). Income-based and royalty-based methods are widely used.

The income-based method takes into account additional net revenues of the licensee, i.e. it determines revenue growth in comparison with revenues of the previous period after license purchasing which are shared between the licensee and the licensor.

The licensor's share varies between 10 and 50% depending on price forming factors: patent protection; a type of transferred rights (exclusive or non-exclusive); a level of goods and manufacturing process preparation for industrial development; market situation and market perspectives.

Let us assume that annual payments made to the licensor are equal and transferred during an uncertain period (exclusive right). The license value can be calculated by formula:

$$P = \frac{\overline{M}}{E},\qquad(1)$$

where P – license value; $\overline{M}$ - mean annual payments to the licensor; E – discounting coefficient equal to the deposit interest rate in a reliable bank.

If the licensee purchases a non-exclusive license, and annual payments to the licensor can be different, the license value is calculated by summing up annual payments to the licensor:

$$P = \sum_{t=1}^{T} \frac{M_t}{(1+E)^t},\qquad(2)$$

where P – license value; M_t - future payments to the licensor in year, t; E – discounting coefficient which is equal to the deposit interest rate in a reliable bank; T – time period (number of years) of intellectual property object use.

Based on the license value calculated, the payback period is calculated by formula:

$$PP = \frac{P}{R_a - \overline{M}},\qquad(3)$$

where PP – payback period (capital investment); R_a- mean annual additional net revenues; $\overline{M}$ – mean annual payments to the licensor.

The royalty-based method. Royalties are typically agreed upon as a percentage of gross or net revenues derived from the use of an asset or a fixed price per unit sold of an item of such. With regard to price forming factors, royalties are calculated using the following rates: 4-10% in the electronic industry; 1-5% in the electrotechnical industry; 2-7% in the pharmaceutical industry; 6-10% in the aircraft building industry; 1-3% in the automobile industry; 4,5-7,5% in the machine tool industry; 5% in the durable consumer goods industry; from 0,2 to 1,5% in the short life goods industry (Asaul, et al., 2008).

In most cases, the royalty rate is 5% of the goods value. With small production volumes, it varies between 7 and 10 %, and with large production volumes it varies between 1 and 4%.

With regard to the licensor's percentage of additional revenues, the royalty rate can be calculated by formula:

$$R = \frac{\overline{V} * d}{\overline{Q}},$$
(4)

where R – royalty rate, $\overline{V}$ - mean annual additional net revenues, d – licensor's percentage of additional net revenues, $\overline{Q}$ - mean annual volume of products sold.

Based on the royalty rate calculated, the license value can be determined by discounting of annual payments and summing them up for a period of the use of an asset by formula:

$$P = \sum_{t=1}^{T} \frac{Q_t * R}{(1+E)^t},$$
(5)

where P – license value; Q_t - volume of licensed products sold in year t; E – discounting coefficient which is equal to the deposit interest rate in a reliable bank; T – time period (number of years) of the use of an asset.

The license value can be distributed in time in case of annual payments to the licensor which are equal to the royalty percentage of the value of products sold this year. In business practice, the license value can be calculated or negotiated.

The cost-based method involves summation of object restoration or substitution costs. Thus, the method involves calculation of costs on production of an object which is equivalent to the object under assessment and takes into account IPA production and commercial development costs, and revenues of an investor derived from the production of an intellectual property object (Surin & Molchanova, 2008).

IPA development costs can be calculated taking into account equivalent intellectual property object production costs in prices and fares at the date of assessment. Investor's revenues are calculated on the basis of rates of return on investment (comparing investment with similar risk levels) and time for producing an asset which is assessed.

IPA replacement cost is calculated by summing up all the costs (at the date of assessment) of production of an equivalent asset. When accounting an intellectual property object as an IA, its value is calculated by summing up actual costs.

New product and technology development, sample production, information and equipment purchasing and salary expenditures are taken into account. When accounting a new intellectual property object, an accounting statement ("Intangible asset accounting", 2007) can be a guide. Only if the following requirements are met, the intellectual property object can be recognized as an IA: 1) documentation (protection documents or a know-how confidentiality contract), 2) commercialization and profit generation.

The IPA's value is calculated based on previous costs (if they are distant in time) and current market IPA's value by formula:

$$P = \sum_{t=1}^{T} S_t (1+E)^t,$$
(6)

where P – current value of the object; S_t – intellectual property object production costs in t year; T – time period when expenditures are made before the assessment date; E – discounting coefficient which is equal to the deposit interest rate in a reliable bank.

The comparative method can be used if there is available and reliable information about the process of equivalent objects. Prices of analogues should be adjusted (Dvurechenskii, Smolyaninov & Ioda, 2016).

The method involves the following stages: 1) identification of certain elements by which objects are compared; 2) identification of the nature and degree of differences; 3) price adjustment by each comparison element.

The stages allow assessing the market IPA's value by justified generalization of adjusted prices of analogue objects. The method has the following variations: calculation of the IPA's value based on prices of alternative objects which are in mass market demand; calculation of the IPA's value based on prices of analogue objects with regard to quality parameters. Quality parameters are selected by experts.

Price adjustment values are determined by the following methods: direct pairwise comparison of prices or revenues derived from the use of analogue objects differing in one element which is a basis for price adjustment; calculation of costs of changes in characteristics of the element by which the analogue differs from the object under assessment; expert justification of price adjustment. (Federal law "On valuation activity in the Russian Federation" dated 29.07.1998 N 135-FZ Article 3. (1998))

6.   Findings

The analysis shows that existing IPA assessment methods take into account a variety of price forming factors. The income-based method can be applied if the certainty level for predicted demand is high. The cost-based method is applied to determine the value of intellectual property objects designed to improve efficiency of internal industrial processes of the enterprise. The comparative method can be used to assess intellectual property objects having market analogues.

7.   Conclusion

An optimum IPA assessment method is important for developing competitive advantages of enterprises and the national economic system, improving its innovation climate. Drawbacks of intellectual property management reduce investment activities in knowledge-intensive Russian industries, which influence the competitive capacity of the national economy.

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