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Evaluation criteria for enterprise's intellectual property management effectiveness

Abstract. *Introduction.* Formation of intellectual property (IP) and its effective use is an important way to increase competitiveness of the enterprise. The issues of the effectiveness of enterprise intellectual property management evaluation are gaining importance in the contemporary economy. However, enterprises have no clear criteria and methodological guidance for evaluating the effectiveness of intellectual property management. *Purpose* of the article is to study the characteristics of the domestic enterprises' intellectual property formation and to determine the main criteria for evaluating intellectual property management of the company. *Results.* The article defines basic trends in the development of innovative property of enterprises in Ukraine for the 2010-2014 period. In 2014, low activity of Ukrainian companies in the creation of intellectual property was observed and negative trends in reduction the number of applications for industrial property was observed with a total of 4%, decrease in applications for utility models – 12,1% and inventions – 9.4%. In 2014, compared to the rate of 2010 (58%) the number of applications increased significantly only for industrial designs. In recent years the ratio between domestic and foreign applicants remained virtually unchanged (in 2014, the share of applications from foreign enterprises was 49% of the total number of applications). The basic criteria for effective IP management which include profit, profitability, productivity, innovativeness, production technology quality improvement, product quality improvement, patentability, creation of sustainable competitive advantages and increase of the market value of the company are grounded. The analysis of effectiveness of intellectual property management in accordance with the selected criteria was done on the example of PJSC «Odeskabel». The analysis shows that the management of intellectual property of PJSC «Odeskabel» meets almost all the criteria of effectiveness and demonstrates the innovative activity of the studied enterprise in recent years. *Conclusion.* Evaluating the effectiveness of intellectual property management is an important part of the company's intellectual property formation. Evaluation criteria elaborated in this area will comprehensively investigate the effectiveness of companies' intellectual property management.

Keywords: Intellectual Property; Intellectual Property Management; Evaluation Criteria; Management Effectiveness

JEL Classification: C130; D290; D810

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Критерії оцінки ефективності управління інтелектуальною власністю підприємств

Анотація. Стаття присвячена дослідженню критеріїв оцінки ефективності управління інтелектуальною власністю підприємства в сучасних умовах. Виявлені негативні тенденції у формуванні інтелектуальної власності вітчизняних підприємств у динаміці останніх років. Обґрунтовано основні критерії оцінки ефективності управління інтелектуальною власністю. На прикладі промислового підприємства ПАТ «Одескабель» проведено аналіз ефективності управління інтелектуальною власністю відповідно до виділених критеріїв.

Ключові слова: інтелектуальна власність; управління інтелектуальною власністю; критерії оцінки; ефективність.

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Критерии оценки эффективности управления интеллектуальной собственностью предприятий

Аннотация. Статья посвящена исследованию критериев оценки эффективности управления интеллектуальной собственностью предприятия в современных условиях. Выявлены негативные тенденции в формировании интеллектуальной собственности отечественных предприятий в динамике последних лет. Обоснованы основные критерии оценки эффективности управления интеллектуальной собственностью. На примере промышленного предприятия ПАО «Одескабель» проведено анализ эффективности управления интеллектуальной собственностью по выделенным критериям.

Ключевые слова: интеллектуальная собственность; управление интеллектуальной собственностью; критерии оценки; эффективность.

Problem statement. Today, intellectual property (IP) plays an extremely important role in shaping the achievements of a single enterprise and the economy as a whole. Competitiveness of modern enterprises is directly related to their ability to create intellectual property and promote it in the market. Formation of the company's intellectual property and its effective use increases the assets of the company, its market value and attractiveness. Therefore, the issues of evaluating the effectiveness of enterprise intellectual property management acquire special importance in the contemporary economy. However, enterprises have no clear criteria and methodological support of evaluating the effectiveness of intellectual property management.

Analysis of recent research and publications. Effectiveness of intellectual property management was considered in the works of such foreign scholars as W. M. Landes (2003); L. Edvinsson and C. Yeh-Yun Lin (2010); P. H. Sullivan (2000); J. D. Teece (2002); W. M. Cohen (2002); B. Hirosaki (2005) [1-6].

Theoretical and methodological aspects of evaluating the effectiveness of intellectual property management are reflected

in the works of M. V. Vachevskiy, V. G. Zinov, A. V. Kendyukhov, V. P. Chebotarev, P. Tsybulov and others [7-10]. Despite the existence of a large number of relevant publications in this field, the issues related to the development of the organizational methodological support of the intellectual property management and the formation of criteria and methods for evaluating the effectiveness of the IP management at present are not studied.

The purpose of the article is to study the characteristics of enterprise's intellectual property management effectiveness evaluating and define key evaluation criteria for that. The goal necessitated the following tasks: to analyse the main trends in enterprise's IP formation; substantiate the main criteria for IP management effectiveness evaluation.

The main results of the study. The analysis of research devoted to intellectual property management shows that domestic enterprises are just beginning to pay attention to IP management. At most enterprises the processes of IP creation and use have unsystematic, poorly controlled character. Accordingly, in most cases there is no IP management evaluation system.

The study of enterprise intellectual property management effectiveness should, in our opinion, start with an analysis of domestic enterprises activity in the sphere of IP (see Table 1).

Table 1 shows that in 2014 there was a negative tendency to reduce the number of applications for industrial property objects in Ukraine for a total of 4%. There is a significant decrease in applications for utility models – 12.1% and inventions – 9.4%. Only the number of applications for industrial designs increased by 58% in 2014 compared to the indicator of 2010, which is significant. This situation indicates the existence of some problems in the field of intellectual property rights formation at domestic enterprises.

The ratio between domestic and foreign applicants has remained practically unchanged in recent years. Thus, the share of applications from foreign enterprises in 2014 was 49% of the total number of applications, which was also a sign of low activity of Ukrainian companies in the creation of intellectual property objects [11, 34]. According to D. M. Loiko (2013), among the major reasons hampering the growth in the number of applications for intellectual property are the following: a high cost of registration, long registration terms (it takes on average 4-8 months for a utility model, for the invention 1.5-2 years) and low material interest of workers in the revitalization of invention and rationalization [12, 63-64]. We share the views of those scientists who believe that shortcomings in the system of intellectual property management inhibit the formation of companies' intellectual property, because today there is no integrated approach to IP management (concerning information support, expertise, legal support, economic assessment and use of IP). In fact, intellectual property management, as the researchers state, actually ends with the issuance of IP protection document, and issues related to the assessment of use of IP rights, their accounting, economic efficiency evaluation remain open [13, 43; 14, 89].

As noted by researchers, development of criteria for measuring the effectiveness of management is an important element of IP management. These criteria include: costs of maintaining a portfolio of IP and related legal rights; the inventory of IP rights; assessment of knowledge of managers on IP issues; identification and further implementation of IP objects that do not generate income for a company. Integral characteristic of IP management efficiency is periodic assessment of the goodwill of the company [10, 74-75].

Other researchers emphasize that the effectiveness of IP management should be consistent with the criteria of business effectiveness and suggest the following criteria of the effectiveness of intellectual property management: expenses for innovative projects implementation using IP; commercial profitability of innovative project using IP; share of profits from the use of IP in the total income; balance and innovativeness of strategic objectives of the company; coverage of world markets by patenting IP objects; sales proceeds from licenses on IP and legal protection costs; increase in the company's market value; the business value growth due to the use of IP [15]. L. V. Dzhemelinska (2014) states that «evaluation of the intellectual property management effectiveness involves comparison of profits received from the use of these objects with the costs of development, maintenance of the IP rights and commercialization» [16, 155].

Based on the purposes of our research and summarizing the addressed before approaches we consider it appropriate to outline the following evaluation criteria for the effectiveness of intellectual property management of a firm:

1. *Profit* provides orientation of the IP management on intellectual property creation, which is able not only to meet their production needs, but also to be profitable.

2. *Profitability* means proportionality of benefits (revenues, profits) received from the use of IP to the necessary costs for their creation and acquisition.

3. *Performance* involves the creation of intellectual property objects aimed at reducing the time to manufacture products (technological innovation), increased output, etc.

4. *Innovativeness* means orientation of processes of intellectual property creation on the modern achievements of science and technology and the acquisition of intellectual property objects, able to qualitatively improve production processes.

Tab. 1: Receipt of applications for industrial property objects in 2010–2014

| Objects of industrial property | 2010 | 2011 | 2012 | 2013 | 2014 | Growth rate in 2014 to 2010, % |
|----------------------------------|-------|-------|-------|-------|-------|--------------------------------|
| Total received, including: | 46256 | 47202 | 49081 | 53600 | 44391 | -4.0 |
| Inventions | 5310 | 5247 | 4944 | 5418 | 4813 | -9.4 |
| Utility models | 10679 | 10437 | 10229 | 10175 | 9384 | -12.1 |
| Industrial designs | 1686 | 1761 | 1851 | 3778 | 2664 | +58.0 |
| Trademarks and service | 28577 | 29759 | 32051 | 34226 | 27526 | -3.7 |
| Topographies | - | 1 | 3 | 3 | 1 | - |
| Qualified Appellations of Origin | 4 | 4 | 3 | - | 3 | - |

Source: Formed by the Author on the basis of [11, 32]

5. *Improvement of production technologies quality* in the modern conditions of scientific and technological progress is an important sign of efficiency because in some industries technology is changing every 3-5 years.

6. *Improvement of products quality* means, in addition to compliance with certain quality standards, focus on the needs of market segments which become more diverse and individual.

7. *Patentability* means orientation on creation of such intellectual property objects, as a result of research and experimental development, which will provide the company not only with additional income but also will become a source of super-profits due to the transfer of IP.

8. *Creating a sustainable competitive advantage* is an important criterion of the effectiveness that means providing market demand via IP, reducing costs of production, improving products quality, enhancing image characteristics, and so on.

9. *Growth of the market value of the company* means the increase in assets due to the value of intangible assets and the enterprise positioning as an effective, creative and innovative.

Let us perform the analysis of intellectual property management effectiveness of the Odessa cable works PJSC «Odeskabel» according to the selected criteria. Today, PJSC «Odeskabel» has various intellectual property rights, including 8 patents for the production of various kinds of fiber optic cable (FOC). Table 2 shows the annual growth in recent years of fiber optic cable sales in physical and in value terms, respectively, 10.8% and 35.6% to the level of 2012. And the share of these products in total sales is also increasing – by 5.3 percentage points. That is a positive trend of the usage of the given product.

Profit. Analysis of the table shows that there is an annual increase in profits from the production and sale of this product (intellectual property rights object).

Product profitability of PJSC «Odeskabel» tends to an annual increase (by 7.1 percentage points in 2014 to the indicator of 2012), which coincides with the trend of increase in both the proportion of these products in total sales and the volume of its sales. Thus, we can conclude that profitability for this type of product increased.

Performance. The technology of cables production in PJSC «Odeskabel» is constantly improving. For example, in 2014 realization of the modernization project of fiber optic cables production was completed. After the end of the project, the increase in production capacity for the production of FOC by 1.5 times is expected, as well as the increase in the range of products. Besides, a number of copyright certificates on certain technological processes is constantly growing. Most of the production processes at the plant are automated and there is a systematic increase in productivity.

Innovation. PJSC «Odeskabel» continues to successfully develop and explore new directions. In recent years, the enterprise has introduced a number of innovations, among them – the production of heating cables, which is the basis of the system «warm floor». Besides, today the products themselves are new and innovative achievement in data production and are in great demand in the market.

Improving the quality of production technology. During the fiber optic cables production the latest technologies are

Tab. 2: Fiber optic cable sales of PJSC «Odeskabel»

| Indicators | 2012 | 2013 | 2014 | Growth rate in 2014 to 2012, % |
|-------------------------------|----------|----------|----------|--------------------------------|
| FOC sales, including: | | | | |
| In natural volume, ths. km | 364587.5 | 352710.0 | 404069.9 | 10.8 |
| In the cash form, ths. UAH. | 94844.0 | 92981.9 | 128636.7 | 35.6 |
| In percentage of all sales, % | 15.99 | 16.1 | 21.3 | + 5.31 p.p. |
| Sales profits, ths. UAH. | 38152.0 | 41553.0 | 76078.0 | 99.4 |
| Products profitability, % | 6.8 | 7.7 | 13.9 | + 7.1 p.p. |
| FOC sales profits, ths. UAH. | 6100.5 | 6690.0 | 16204.6 | 165.6 |

Source: Formed by the Author on the basis of [17]

used. In its production PJSC «Odeskabel» uses the most modern technological and testing equipment, control equipment and instruments, high-quality materials. Also it constantly buys and installs new equipment and materials, develops new technologies, develops and makes products in accordance with modern technological standards.

Improving the quality of products. Production of high quality goods at competitive prices, which is essential to the market attractiveness of the enterprise, has been a priority in the development of PJSC «Odeskabel» for many years. The following integrated management system in four international standards have been developed and implemented at Odessa cable factory: Quality Management System in compliance with the ISO 9001:2008 standard, Environmental Management System in compliance with the ISO 14001:2004 standard, Occupational Health and Safety Management System based on the OHSAS 18001:2007 standard and the system of Social Accountability in compliance with the SA 8000:2008 standard. This means that the level of production and management of PJSC «Odeskabel» fully meets international standards.

Patentability. PJSC «Odeskabel» has a patent department that deals issues related to intellectual property rights. Besides the abovementioned patents for utility models the company has a large number of trademarks for goods and services and copyright certificates. During its activity, the company extends licenses and transmits the intellectual property rights to other companies on mutually beneficial terms.

Creating a sustainable competitive advantage. The most popular in the domestic market and export-oriented type of cable is the optical fiber cable and the cable for computer networks and structured cabling systems. The total amount of exports by the end of 2014 equaled to 156,106 000 UAH (or 7 433 619 USD), the share of exports in the total amount of sales equaled to 25.5%. The produce of PJSC «Odeskabel» exported to Belarus, Moldova, Kazakhstan, Georgia, Armenia, Azerbaijan, Kirghizstan, the USA, Guinea, the Czech Republic, Slovakia, Romania, France, Great Britain confirms the competitiveness of the enterprise on the world market.

Increase in the market value of the company. PJSC «Odeskabel» is an active member of the main associations of cable and wire producers, such as the Ukrainian Corporation «Ukrelektrokabel» (Kyiv, Ukraine) and the International Cable-makers Federation (Vienna, Austria).

This membership enables PJSC «Odeskabel» to be a modern, innovative and high-tech enterprise, to track global cable market trends and react to them promptly. Large funds are invested in equipment and modernization – the workshops are equipped with modern machinery from Germany, Austria, Great Britain and Switzerland. PJSC «Odeskabel» is among the 50 largest world producers of cable products [17].

The conducted analysis shows that the PJSC «Odeskabel» intellectual property management meets almost all the criteria of efficiency and demonstrates the innovative activity of the enterprise in recent years.

Conclusions, proposals and recommendations for further research. Evaluating the effectiveness of intellectual property management is an important part of the formation of IP at the enterprise. And today, unfortunately, there is no evaluation system for the effectiveness of IP management at domestic enterprises. The article revealed shortcomings in evaluating the effectiveness of IP management. The main criteria for the evaluation of IP management effectiveness are identified. They

include profit, profitability, productivity, innovation, quality of production technology improvement, product quality improvement, patentability, creating a sustainable competitive advantages and increase in the market value of the company. Scientific novelty of the results is the development of theoretical foundations of evaluation of IP management effectiveness based on identifying key evaluation criteria with the help of which it is possible to analyze the effectiveness of IP management. Scientific results and developments of the author do not only have theoretical and methodological, but also practical significance relevant to solving specific practical problems at industrial plants, while forming an effective management system of the creation and use of IP. Prospects for further research are the following: to develop a balanced system of indicators of the enterprise's intellectual property management effectiveness evaluation, to define its calculation methods, to highlight the main principles and factors of building such a system.

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