УПРАВЛІННЯ ПІДПРИЄМСТВОМ

UDC 642.5.024.3.5 : 658.316

O. P. Kosenko, Doctor of Economic Sciences, Associate Professor,
T. O. Kobielieva, Candidate of Economic Sciences, Associate Professor,
N. P. Tkachova, Candidate of Economic Sciences, Associate Professor

MONITORING THE COMMERCIAL POTENTIAL OF INTELLECTUAL PROPERTY

Urgency of the research. *For successful adaptation of the enterprise to the market requirements, a permanent track the performance of the enterprise and rapid response to detected change is needed .*

Target setting. *Development of a monitoring system has an important impact on making commercial decisions on the technology market.*

Actual scientific researches and issues analysis. *Problems of monitoring of the enterprise were researched in the works of Gladenko I. V. [2], Pererva P. G. [3; 4], Grabchenko A. I. [5], Kosenko O. P. [6; 7], Pogorelov M. I. [8], N. P. Tkacheva [9], Tovazhnyansky V. L. [10; 11] and others.*

Uninvestigated parts of general matters defining. *Existing systems of the monitoring process are based on the use of financial indicators, making them focused on a retrospective and does not allow to predict the basic parameters of economic state of the enterprise.*

The research objective. *The main reason of the study is use of the trigonometric functions for process monitoring tasks. These functions are defined in the range of (-1) to (+1), which allows us to provide with the help of a point value, a clear economic interpretation of monitoring functions.*

The statement of basic materials. *The methodical approach to the monitoring of intellectual, industrial and commercial activities of industrial enterprises was developed. A two monitoring trigonometric functions, which individually can display the status of the company in various fields of activity are proposed. Recommendations for using trigonometric functions for process, crisis and market-oriented monitoring are developed. It is proved that the most accurate monitoring result can be obtained by joint use of the proposed functions.*

Conclusions. *The developed guidelines allow the fulfillment of the monitoring of intellectual and innovation enterprise activity, the prevention of undesirable trends in both the enterprise and its product market in a timely manner.*

Keywords: *monitoring; commercial potential; intellectual property objects; commercialization.*

УДК 642.5.024.3.5 : 658.316

О. П. Косенко, д. е. н., доцент,
Т. О. Кобєлєва, к. е. н., доцент,
Н. П. Ткачова, к. е. н., доцент

МОНІТОРИНГ КОМЕРЦІЙНОГО ПОТЕНЦІАЛУ ОБ'ЄКТІВ ІНТЕЛЕКТУАЛЬНОЇ ВЛАСНОСТІ

Актуальність теми дослідження. *Для успішної адаптації підприємства до вимог ринку необхідна система постійно діючого відстежування результатів діяльності підприємства та оперативного реагування на виявлені зміни.*

Постановка проблеми. *Розробка системи моніторингу має велике значення для прийняття комерційних рішень на технологічному ринку.*

Аналіз останніх досліджень і публікацій. *Проблеми моніторингу діяльності підприємства досліджувалися в роботах Гладенко І. В. [2], Перерви П. Г. [3; 4], Грабченко А. І. [5], Косенко О. П. [6; 7], Погорєлова М. І. [8], Ткачової Н. П. [9], Товажнянського В. Л. [10; 11] та ін.*

Виділення недосліджених частин загальної проблеми. *Існуючі системи технологічного моніторингу будуються на використанні фінансових показників, що робить їх орієнтованими на ретроспективу і не дозволяє прогнозувати основні параметри економічного стану підприємства.*

Постановка завдання. *Метою дослідження є використання для завдань технологічного моніторингу тригонометричних функцій. Ці функції визначені в інтервалі від (-1) до (+1), що дозволяє надавати точковим значенням моніторингових функції чітку економічну інтерпретацію.*

Виклад основного матеріалу. *Розроблено методичний підхід до проведення моніторингу інтелектуальної, виробничої і комерційної діяльності промислового підприємства. Запропоновано дві тригонометричні моніторингові функції, кожна з яких окремо може відображати стан справ на підприємстві в різних сферах його діяльності. Розроблено рекомендації щодо використання тригонометричних функцій для технологічного, антикризового та ринково-орієнтованого моніторингу. Доведено, що найбільш точний результат моніторингу може бути отриманий при спільному використанні запропонованих функцій.*

Висновок. *Розроблені рекомендації дозволяють здійснювати моніторинг інтелектуально-інноваційної діяльності підприємств, своєчасно попереджати небажані тенденції як на підприємстві, так і на ринку його продукції.*

Ключові слова: *моніторинг; комерційний потенціал; об'єкти інтелектуальної власності; комерціалізація.*

Rationality of the research topic. For successful adaptation of productive and commercial activity of an industrial enterprise to rapidly changing markets and new customer requirements that allow to estimate the inner potential of the industrial enterprise not only by quality but in numbers as well, a system of the enterprise's activity results constant tracking and operative response to the discovered

changes, is needed. This problem can be solved by development, substantiation and practical use of effective monitoring models as functions of management, what takes on special significance under conditions of high rate of technical progress, development and application of new technologies, and growing importance of the informational support.

Formulation of the problem. The special importance of monitoring is in making commercial decisions on the technological market for such a specific articles as intellectual property objects (IPO).

Analysis of recent research and publications. Problems of analysis, formation and use of industrial enterprise activity various fields and directions monitoring systems have been studied by Ukrainian and foreign scientists. Among them are worth to note basic scientific investigations of I. V. Hladenko [2], P. H. Pererva [3; 4], A. I. Hrabchenko [5], O. P. Kosenko [6; 7], M. I. Pogorelov [8], N. P. Tkachova [9], V. L. Tovazhnianskyi [10; 11] et al.

The investigation results of many scientists bring out clearly that the monitoring of an industrial enterprise productive and commercial activity can be carried out in different directions [2; 3; 6; 7; 10; 11], among which, from our point of view, one can pick out the main six:

1. monitoring of economic activity of an enterprise (economic monitoring) [3; 5; 9];
2. monitoring of financial activity (financial monitoring) [8; 10];
3. monitoring of intellectual property objects (IPO) commercial potential–technological monitoring [6; 7];
4. anti-crisis monitoring of financial and economic indices of the industrial enterprise work [3; 10; 11];
5. monitoring of market situation regarding the articles produced [9; 11];
6. monitoring of the enterprise innovative activity [2; 8; 11].

Determination of unexplored aspects of the general problem. To increase the effectiveness of the economy, parallel with macro-level reforms it is necessary to reform the activity of certain enterprises as micro-level subjects. At that, the role and importance of management component of industrial enterprises functioning increases significantly, the management component being based on the analysis of incoming information and monitoring of production-and-sell and management processes. Meanwhile, the existing systems of monitoring are mainly based on financial indices, what makes them retrospectively oriented and does not allow to forecast main parameters of the economic state. Such situation stipulates for the necessity of integrated control systems allowing to make overall analysis of the data and synthesis of the management actions. Although each of the mentioned directions has its own original methodological and methodical basis of the investigations, they are united by common methodical approach to organize and carrying out the monitoring. In this connection, the authors made an effort of creating the conceptual basis of monitoring to be used in each of the mentioned directions.

Setting an objective. Analysis of the stated problem condition allowed to discover the fact that the less developed are points of technological monitoring, the further development of which became the main goal of this research. To the centre of this research, authors place the use for the tasks of trigonometrical functions monitoring. Such choice, from their point of view, is conditioned by the fact that these functions are determined in sufficiently narrow interval – from (-1) to (+1), what allows to provide the punctual values of monitoring functions with precise economic interpretation.

Research results. Economic, financial, intellectual, production and commercial, innovative, market-and-marketing activity of an enterprise is somehow characterised with a host of multifarious indices that can be divided into certain groups. In our opinion, in the context of our research, two main groups of indices (x and y; α and β) should be distinguished and be deciding by intellectual, productive and commercial, innovative, market-and-marketing activity level evaluation.

1. By carrying out economic monitoring:
   a) production and commercial activity costs and benefits indices;
   b) indices of material and technical provision of an enterprise.
2. By carrying out financial monitoring:
   a) indices of provision of an enterprise with necessary assets for successful activity;
   b) indices of debtor and creditor liabilities of an enterprise in statics and in dynamics.
3. By carrying out anti-crisis monitoring:
   a) indices of market successfulness of an enterprise for the given period of time;

b) indices of financial stability of an enterprise in the market environment.

4. By carrying out technological monitoring:
   a) indices of IPO commercial potential;
   b) indices of transfer market opportunities and practical use of IPO.
5. By carrying out market conjuncture monitoring:
   a) macro-economic market characteristics of products (demand and supply);
   b) micro-economic market characteristics of products (quality and price).
6. By carrying out innovative activity monitoring:
   a) production and financial indices of innovative activity scale at an enterprise;
   b) indices of innovative activity effectiveness.

The existing base of investigations recommends for groups a) and b) a great deal of indices impossible in a number of cases to be taken into account at all or, if taken into account, they bear significant error which can lead in some cases to fallacious conclusions. In this connexion, from each group mentioned above we have chosen, evaluated and substantiated only two indices, which, in our opinion, can result in quite reliable conclusions and recommendations (Tab. 1).

Table 1

Values of monitoring indices in different types of monitoring

Type of monitoring	Designation of argument			
	x	*y*	*α*	*β*
Economic	Production costs	Sales income	Capital productivity	Capital requisites
Financial	Common value of assets	Sum of assets on accounts	Debtor liabilities	Creditor liabilities
Innovative	Sale of innovative products	Manufacture of innovative products	Innovation budget	Need for resources for innovations
Conjuncture	Supply	Demand	Index of product quality	Index of product prices
Ant-crisis	Scope of production	Scope of sale	Arrears to state budget	Arrears of wages
Technological	General effect of IPO user	General effect of IPO creator	Customer value of IPO	Risk of IPO commercialization

Source: worked out by authors

For example, at carrying out the anti-crisis monitoring, from indices of group a) we picked out the indices of production scope and products sale scope, and their interconnection at every stage of the analysed period of time. From indices of group b) it were the index of debtor liabilities, i. e. the scopes of financial arrears of the enterprise by its debtors, and the index of the expanded creditor liabilities, i. e. the scopes of financial arrears of the enterprise to its creditors, to state budget and to workers in the form of wages. Investigation of interaction between these indices within a period of time allows to determine objective tendencies in changing the level of working capacity of the given enterprise, enables to evaluate the prospects of its firm and stable development. At the same time, the indices we picked out are used in different correlation dependences which describe static condition and dynamic prospects of an enterprise's development, the sort of the prospects in many respects to be determined by the level of mass quantity of the products, production programme of the enterprise, and cost price of the products.

For objective evaluation of productive and commercial activity of a machine-building enterprise, authors propose to use mechanism of interaction between indices they picked out from group a) and group b) within period of time equal to one year (quarter, month, ten days etc.).

Authors worked out a methodical approach of monitoring the level of IPO commercial potential on the basis of trigonometrical functions application, the effectiveness of which is proved with practical monitoring of anti-crisis tendencies [10; 11] and fluctuations of economic conjuncture [9; 11].

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It is proved that preciseness and objectiveness of IPO commercial potential level current situation evaluation mainly depends on potential economic effect level E_p, which can be obtained by IPO creator at commercialization of IPO, as well as by user of this IPO at the use E_c. Values of indices E_p and E_c are worthwhile to be used for current evaluation of IPO market attraction (market potential) level changes. For solving this problem, it is recommended to use the tangential function F_1:

$$F_1 = tg\,[\pi\,(E_p - E_c)/4\,E_p],\ \text{by}\ E_p > E_c;\quad F_1 = tg\,[\pi\,(E_p - E_c)/4\,E_c\,,\ \text{by}\ E_c > E_p \qquad (1)$$

Functions (1) are considered both for the whole of particular enterprise technological market (general effectiveness of the creator and general effectiveness of potential users of IPO are taken into account) and for individual intellectual product (technology) of the creator enterprise (the level of individual technology market attraction is considered).

In many cases, function F_1 is not sufficient for making scientifically well-grounded decisions on market prospects of technological product, what creates objective grounds for expansion of monitoring mechanism to indices directly concerned with intellectual technology. The stated problem is solved by use of monitoring anti-tangential function F_2:

$$F_2 = arctg\,\frac{\pi}{4}\left(\frac{IQ_{tech}^{compl} - IR_{tech}^{compl}}{\sqrt{(IQ_{tech}^{compl})^2 + (IR_{tech}^{compl})^2}}\right)$$

where IQ_{tech}^{compl} is integral index of IPO quality; IR_{tech}^{compl} is risk condition of successful IPO commercialization calculated by the creator, with taking into account risk factors (IR_{tech}^{compl} = 0...1; IR_{tech}^{compl} = 0 for absolute riskless possibility of IPO commercialization; IR_{tech}^{compl} = 1 for absolute impossibility of successful IPO commercialization).

Practice of independent use of monitoring functions F_1 and F_2 gives positive results. Each of these functions represent separate aspects of commercial activity of both IPO creators and users. At the same time we think that results of technological monitoring will be most effective only by integral (simultaneous) application of monitoring functions F_1 and F_2 (Tab. 2).

Table 2

Economic characteristic of monitoring functions F_1 and F_2 common action zones

General condition of cluster	Function values		Correlation of arguments		Creator enterprise transfer policy condition tendencies characteristic
	F_1	F_2	E_p and E_c	IQ_{tech}^{compl} and IR_{tech}^{compl}	
Passive transfer	$1 > F_1 > 0$	$-1 < F_2 < 0$	$E_p > E_c$	$IQ_{tech}^{compl} < IR_{tech}^{compl}$	Customer weakly reacts to propositions of IPO commercialization, desiring reduction in prices and in commercial risk level
Active transfer	$1 > F_1 > 0$	$1 > F_2 > 0$	$E_p > E_{cn}$	$IQ_{tech}^{compl} > IR_{tech}^{compl}$	IPO creator and user accept positively the indices. Share of the transfer depends on the activity of both parts
Transfer with high values	$-1 < F_1 < 0$	$1 > F_2 > 0$	$E_p < E_c$	$IQ_{tech}^{compl} > IR_{tech}^{compl}$	Customer's commercial interest to IPO is heightened due to attractive prices. Extensive transfer possibilities
Transfer with overstated values	$-1 < F_1 < 0$	$-1 < F_2 < 0$	$E_p < E_c$	$IQ_{tech}^{compl} < IR_{tech}^{compl}$	Thanks to low prices, creator uses overstated by customer IPO values. There are difficulties with transfer

Source: worked out by authors on the basis of [6; 7; 10; 11]

According to authors' propositions, there was carried out commercial potential condition monitoring of IPO owned by machine-building enterprises and scientific institutions of Kharkov region. In particular, there was made a detailed market potential analysis of patents belonging to «Ukrelektromash» Public Corporation, «FED» Kharkov Machine-Building Plant State Enterprise, and «Elektrotiazhmash»

Public Corporation, which provide for the higher effectiveness of asynchronous motors, aeronautical equipment and powerful generators production. By their example the authors carried out an approbation of worked out propositions, the results of the approbation are shown in Table 3.

Table 3

Economic characteristic of IPO commercialization market prospects according to monitoring functions F_1 and F_2 condition analysis results

Patent No	Economic characteristic of transfer (market prospects of commercialization)		
	According to monitoring function F1 characteristics	According to monitoring function F2 characteristics	According to functions F1 and F2 common action characteristics
UA 93317	Ineffective	Heightened risk	With overstated values
UA 24139	Ineffective	Active marketing	With overstated values
UA 31382	Ineffective	Active marketing	With overstated values
UA 40394	Ineffective	Active marketing	With overstated values
UA 70215	Ineffective	Active marketing	With overstated values
UA 85274	Effective transfer	Active marketing	Active transfer
UA 87423	Ineffective	Active marketing	With overstated values
UA 87866	Effective transfer	Heightened risk	Active transfer

Source: compiled by authors on the basis of [6]

From the most important patent characteristics shown in Table 3, special attention was drawn to those that form conditions of functions F_1 and F_2 arguments proposed by us as main for carrying out the technological monitoring. It is worth to note that according to data from enterprises and organizations, the selected patents are included to commercial briefcase with the aim of their commercialization (commercial utilization at the own enterprise, sale to other customers or other independent or combined types of commercialization).

Conclusions. Methodical approach to monitor IPO commercial potential level on the basis of trigonometrical functions allows to evaluate market, customer and quality indices of IPO, to realize constant market-and-commercial monitoring of intellectual and innovative activity of enterprises, to prevent in good time the undesirable tendencies both at an enterprise and at the market of its production.

The approbation of propositions worked out for monitoring the intellectual technologies market attraction level indicates that tangential and anti-tangential monitoring functions can be used for quite objective and effective monitoring of IPO commercial potential with the aim to commercialize them successfully in the most favourable periods of time.

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Received for publication 4.10.2016

Бібліографічний опис для цитування :

Kosenko, O. P. Monitoring the commercial potential of intellectual property / O. P. Kosenko, T. O. Kobielieva, N. P. Tkachova // Науковий вісник Полісся. – 2017. – № 1 (9), ч. 2. – С. 140-145.