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.

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. Hladen-
ko [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 en-
terprise 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 enter-
prises as micro-level subjects. At that, the role and importance of management component of industri-
al 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 anal-
ysis 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 au-
thors made an effort of creating the conceptual basis of monitoring to be used in each of the men-
tioned 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 trigo-
nometrical 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, mar-
ket-and-marketing activity of an enterprise is somehow characterised with a host of multifarious indi-
ces 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 debitor 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

<table>
<thead>
<tr>
<th>Type of monitoring</th>
<th>Designation of argument</th>
<th>$x$</th>
<th>$y$</th>
<th>$\alpha$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic</td>
<td>Production costs</td>
<td>Sales income</td>
<td>Capital productivity</td>
<td>Capital requisites</td>
<td></td>
</tr>
<tr>
<td>Financial</td>
<td>Common value of assets</td>
<td>Sum of assets on accounts</td>
<td>Debtor liabilities</td>
<td>Creditor liabilities</td>
<td></td>
</tr>
<tr>
<td>Innovative</td>
<td>Sale of innovative products</td>
<td>Manufacture of innovative products</td>
<td>Innovation budget</td>
<td>Need for resources for innovations</td>
<td></td>
</tr>
<tr>
<td>Conjuncture</td>
<td>Supply</td>
<td>Demand</td>
<td>Index of product quality</td>
<td>Index of product prices</td>
<td></td>
</tr>
<tr>
<td>Ant-crisis</td>
<td>Scope of production</td>
<td>Scope of sale</td>
<td>Arrears to state budget</td>
<td>Arrears of wages</td>
<td></td>
</tr>
<tr>
<td>Technological</td>
<td>General effect of IPO user</td>
<td>General effect of IPO creator</td>
<td>Customer value of IPO</td>
<td>Risk of IPO commercialization</td>
<td></td>
</tr>
</tbody>
</table>

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].
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 tangent function $F_1$:

$$ F_1 = \tan \left( \pi \frac{(E_p - E_c)/4 E_p}{E_p} \right), \quad E_p > E_c; \quad F_1 = \tan \left( \pi \frac{(E_p - E_c)/4 E_c}{E_c} \right), \quad E_c > E_p $$

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-tangent function $F_2$:

$$ F_2 = \arctg \left( \frac{1}{4} \left( \frac{IQ_{\text{compl}}{\text{tech}}}{IR_{\text{compl}}{\text{tech}}} - \frac{IR_{\text{compl}}{\text{tech}}}{IQ_{\text{compl}}{\text{tech}}} \right) \right) $$

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

<table>
<thead>
<tr>
<th>General condition of cluster</th>
<th>Function values</th>
<th>Correlation of arguments</th>
<th>Creator enterprise transfer policy condition tendencies characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive transfer</td>
<td>$F_1 &gt; 0$</td>
<td>$F_2 &lt; 0$</td>
<td>$E_p &gt; E_c$; $IQ_{\text{compl}}{\text{tech}} &lt; IR_{\text{compl}}{\text{tech}}$</td>
</tr>
<tr>
<td>Active transfer</td>
<td>$F_1 &gt; 0$</td>
<td>$F_2 &gt; 0$</td>
<td>$E_p &gt; E_c$; $IQ_{\text{compl}}{\text{tech}} &gt; IR_{\text{compl}}{\text{tech}}$</td>
</tr>
<tr>
<td>Transfer with high values</td>
<td>$F_1 &lt; 0$</td>
<td>$F_2 &gt; 0$</td>
<td>$E_p &lt; E_c$; $IQ_{\text{compl}}{\text{tech}} &gt; IR_{\text{compl}}{\text{tech}}$</td>
</tr>
<tr>
<td>Transfer with overstated values</td>
<td>$F_1 &lt; 0$</td>
<td>$F_2 &lt; 0$</td>
<td>$E_p &lt; E_c$; $IQ_{\text{compl}}{\text{tech}} &lt; IR_{\text{compl}}{\text{tech}}$</td>
</tr>
</tbody>
</table>

*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 «Укрелектромаш» Public Corporation, «FED» Kharkov Machine-Building Plant State Enterprise, and «Електротиазмаш»
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 approba-
tion of worked out propositions, the results of the approbation are shown in Table 3.

**Table 3**

<table>
<thead>
<tr>
<th>Patent No</th>
<th>According to monitoring function F1 characteristics</th>
<th>According to monitoring function F2 characteristics</th>
<th>According to functions F1 and F2 common action characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA 93317</td>
<td>Ineffective</td>
<td>Heightened risk</td>
<td>With overstated values</td>
</tr>
<tr>
<td>UA 24139</td>
<td>Ineffective</td>
<td>Active marketing</td>
<td>With overstated values</td>
</tr>
<tr>
<td>UA 31382</td>
<td>Ineffective</td>
<td>Active marketing</td>
<td>With overstated values</td>
</tr>
<tr>
<td>UA 40394</td>
<td>Ineffective</td>
<td>Active marketing</td>
<td>With overstated values</td>
</tr>
<tr>
<td>UA 70215</td>
<td>Ineffective</td>
<td>Active marketing</td>
<td>With overstated values</td>
</tr>
<tr>
<td>UA 85274</td>
<td>Effective transfer</td>
<td>Active marketing</td>
<td>Active transfer</td>
</tr>
<tr>
<td>UA 87423</td>
<td>Ineffective</td>
<td>Active marketing</td>
<td>With overstated values</td>
</tr>
<tr>
<td>UA 87866</td>
<td>Effective transfer</td>
<td>Heightened risk</td>
<td>Active transfer</td>
</tr>
</tbody>
</table>

*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 trigono-
nometrical functions allows to evaluate market, customer and quality indices of IPO, to realize con-
stant market-and-commercial monitoring of intellectual and innovative activity of enterprises, to pre-
vent 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 a-
traction level indicates that tangential and antitangential 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.

**References**

1. Pererva, P. G., Zhehus, O. V. Naukovo-innovatsiinyi potential Ukrainy ta suchasni problemy yoho vykorystannia [Research and innovation potential of Ukraine and contempor-
4. Pererva, P. G. Самомаркетинг менеджера і биз-

**Література**

4. Перерва, П. Г. Самомаркетинг менеджера та біз-

Kosenko O. P., Kobielieva T. O., Tkachova N. P. Monitoring the commercial potential of intellectual property
УПРАВЛІННЯ ПІДПРИЄМСТВОМ


Received for publication 4.10.2016

Бібліографічний опис для цитування :