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Маркетинг інновацій

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CHARACTERISTICS OF MARKETING OF INDUSTRIAL INNOVATIONS IN THE REGION

The article explores the concept of the essence and specificity of formation of the marketing system of scientific and technical products in the region. The author analyses the current state of market of innovations in the regions. Article defines the factors affecting the area of activity of the research organization in the region and offers methodical approaches to the estimation of the factors considered in the economic analysis of new products.

Keywords: market, scientific and technical production, scientific and technical organization, marketing, regional development.

Relevance and statement of the problem. The market economy, implies that the whole system of production and service delivery should be aimed at meeting the needs and demands of consumers. The experience of countries with developed market economies [1] strongly suggests that these problems are successfully solved using the principles and methods of marketing. There are many different definitions of marketing, but, ultimately, they can be summarized as follows: marketing is a system of practical measures aimed at the subordination of production to consumers' needs, ensuring the profitability of production. A special place in a unified system of marketing belongs to the marketing of scientific and technical products for industrial use. Today, these issues have not yet received sufficient attention in the researches of economic scientists in our country.

The analysis of recent research and publications. The results of scientific and technical research are performed as scientific and technical products and also as goods of special kind. Such products not always have material or tangible form, they have a specificity in the implementation and end use. So, scientific and technical products require a combination of specific marketing activities. The problems which are investigated in the article are analyzed in the works of such scientists as Fedulova L.I., Osezkiy V.P., Bagal U.M. [1], Kluka U.B. [3], Haustov V.K. [4], Amosha A.I., Buleev I.P., Dubnitskii V.I. [6]. A comprehensive marketing approach includes market analysis, development of innovative strategies and operational marketing.

It should be noted that market relations can be called as the relationship between state-owned enterprises (organizations), if they work in conditions of free prices, fully oriented their activity on ratio of supply and demand and, in the case of unprofitability, are declared bankrupt. Market system can not be called a system, in which the subjects of exchange are related sharing common property without providing with economic isolation. The research of specifics of functioning market and non-market economic sphere [8] leads to the following conclusions:

- part of the products of labor are implemented through the mechanism of purchase and sale that meet specific needs, a commodity;
- the market system has a mechanism of self-regulation that assumes marketing approach to the organization of production, which means offering the market the product that the buyer is willing to buy that what will satisfy a particular need for solvency;
- in order to the scientific and technical products become a commodity, it is necessary that its value accept social nature in the process of exchange, that is, through to the market, and not determined “before” (in this case, the product is not a commodity, and its cost has directly-social character);
- the natural property of the product is its usefulness, the ability to meet individual needs, which characterizes its consumers value.

The development of the regional market of scientific and technical products is directly related to the level of economic development of the country:

- fall in the level of development of the productive sphere reduces the effective demand for innovation, market of scientific and technical production is stagnating and shrinking;
- decline in social-economic development leads to a decrease in government revenues, hence, its expenses (without the involvement of internal and external loans);
- government budget deficit leads to inflation, more expensive loans, which negatively affects the market of long-term scientific research and development of activities projects, however they are usually high technological and the most promising.

Among the factors of enterprises immunity to research results are the following [9]:

- scientific research and development activities are not necessary;
- incentives and competition do not affect the performance of the firms;
- complex technologies are being imported;
- small firms can not afford to invest in scientific research and development activities;
- the company is focused on short-term commercial projects;
- deficiencies in infrastructure development;
- fiscal policy does not encourage scientific research and development activities.

The purpose of this article is to research the main stages of marketing activities in the regions for a specific commodity – industrial innovation developed by the scientific and technical organization.

The main material. During the conducting of marketing researches we have been forming the marketing environment of scientific and technical organization (STO) which is an innovator. This environment includes an assessment and analysis of micro- and macrostructure and in our opinion takes the form Fig. 1.

Information about the *suppliers* is necessary to understand in order to know whether this research can be carried out at all. Even if the idea of the research is expected to be commercially attractive, the work as a whole may be unsuccessful, for example, because of

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the extremely high cost of supply (for example, in the case of customization of unique equipment and apparatus). If scientific and technical products are intended for latter use by the customer for production purposes, it is important to know and show the consumer the possibility of equipment delivery and materials for these purposes.

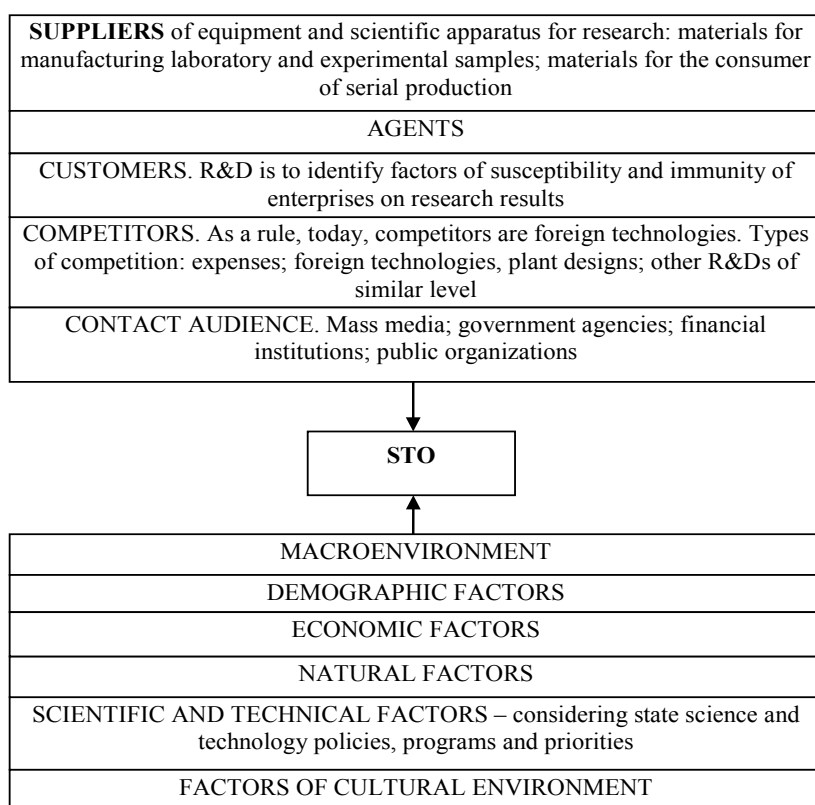


Figure 1 – Micro- and macrostructure of R&D

Among the economic factors in the macrostructure of scientific research and development activities the most significant in our opinion are:

- financial position and income dynamics of production and end users;
- the dynamics of prices and wages;
- the cost of credit;
- general economic situation in the country (recession, depression, recovery).

In terms of inflation and rising prices short-term interests are prevailing in the system of interests of the company. These factors also affect the growth of the expenses on creating scientific and technical products. In other words, industry costs are limited by the deficit of available financial and material resources.

During the implementation of innovation and appearing of it on the market, it is necessary to be clear in positioning it. Segmentation is a process of dividing consumers on certain of

groups that differ in consumer preferences. You can select the following principles of segmentation of the market of scientific and technical products:

- regional;
- product-sectoral;
- functional;
- disciplinary;
- problematic.

We consider that regional principle involves dividing of the market into the separate regions of different requirements for scientific and technical products. Regional division is quite important for the market of innovations, since regional consumers of innovations in many industries appear, and especially in industry of final products which are distinguished by their customer requirements. With this principle of segmentation both domestic and international aspect should be taken into consideration. In addition to it, for the scientific and technical products, it is important to take into consideration the geographical location of direct consumers, the results of scientific research and development activities itself and products made from them.

If we talk about the scientific research and development activities then in this aspect it is important to consider:

- overall scientific and technological level of the region, the level of qualification of engineering and technical personnel of the enterprises in the region;
- competition from the scientific and technical organizations located in the region;
- competitive technologies of other countries in the region.

Product-sectoral principle is especially important for multi-STO, working for different sectors, as well as the STO producing scientific and technical production of multi-purpose. In general the following sectors can be highlighted: fuel energy, machinery, chemical industry, metallurgy and other branches of the production sector, health care and other non-production sectors. Within each of these groups, there are many subsectors, set of which is specific for each STO.

The *functional* principle is that consumers of science and technical products can be grouped by the functions they perform. The concept of function is broader than the concept of product or technology. For example, automobile factory, factories for the production of commuter trains and electric forklifts, subway cars and trolleys are producing a variety of products, which refer to the different sectors and sub-sectors. They all share one feature-moving of cargoes. STO can work on specific projects, such as electrical equipment for subway cars or can cover a variety of projects united by a common function.

Disciplinary principle suggests that consumers of innovations can demand the research in specific disciplines. For example, such as mathematics, physics, chemistry, biology and others. Consumers of the same disciplinary research will produce a variety of projects, perform dissimilar functions. Interest in particular disciplines will be common for them.

The essence of the *problematic* principle is that the scientific problems are usually interdisciplinary. The same scientific problems may be interesting for various customers. For example, the problem of superconductivity, artificial intelligence and others have cross-sectoral cross-functional application.

Positioning in the market is providing a competitive position for goods on the market. Indicators of quality of scientific and technical production are measures of the quality and reliability of the analyzed innovation. The result of creation and implementation of innovation,

in general, is the economic effect that the consumer receives from the use of this innovation.

Significant impact on the positioning of scientific and technical products has a risky factor. In general terms, it can be divided into the following types of risks: concluded in the project, in the idea; occurring during the development of the project; appearing in the manufacturing process; resulting in the implementation of the final product; happening because of changes in the economic and political conditions.

After the segmentation of scientific and technical production market there is a problem in measuring of the volume or capacity of each segment. The formula for calculating of the capacity of segment can be represented as follows:

$$V = H \cdot Q \cdot d, \quad (1)$$

where V – capacity of segment and the market, thsd UAH; H – the volume of production in the segment, thsd UAH; Q – research intensity per unit of output of segment, thsd UAH; d – the proportion of contract research in overall scientific research and development activities of segment.

Each component of the formula is evaluated for the future by analysis of statistical material for the certain period of time. Production volume in the segment determines the total weight and the need for scientific knowledge, as well as their dynamics. Depending on the dynamics of production volume, segment of the market may be expanding, stable or shrinking. Our research has shown that scientific research in the segment can be made in the following ways: by the scientific departments of enterprises; by external developers.

Our research has shown that marketing of innovations for industrial use in the region can be represented by two main types: marketing of innovations of contract organizations and marketing of innovations generated directly within enterprises.

Marketing of contract researches involves figuring out the influence on the market, primarily of two factors – technological progress and the needs of end users. Customers of contract researches are enterprises of different industries, but the largest part of them is high-tech production: biotechnology, chemistry, electronics, etc. The need for contract research for the client appears from the fact that their conducting will allow them to:

- expand their knowledge about the technology and its capabilities by bringing intellectual potential of the author and with the help of this to get high quality product;
- provide cost reduction by eliminating of the costs arising from the transfer of technology, in the case of purchasing of the license;
- obtain new opportunities of sales due to assistance of the contractor from the use of his links and information;
- reduce the level of competition by attracting a competitor as a contractor (the division of segments of the market, development of industrial cooperation, etc.);
- take into consideration features of the enterprise, features of the region and the industry to which they belong.

Thus, we have demonstrated that the innovation process should take into consideration both technological capabilities of the research structure (either company-innovator) and needs of market (Figure 2). The process of marketing management of industrial innovations can be divided into four blocks: analysis and forecast of scientific and technical market opportunities; selection of target markets; the development of complex of marketing; practical implementation of marketing activities [10-12]. The first block involves the collection of information about the environment in which the enterprise operates, the analysis of this information and development of recommendations for decision-making in the remaining blocks.

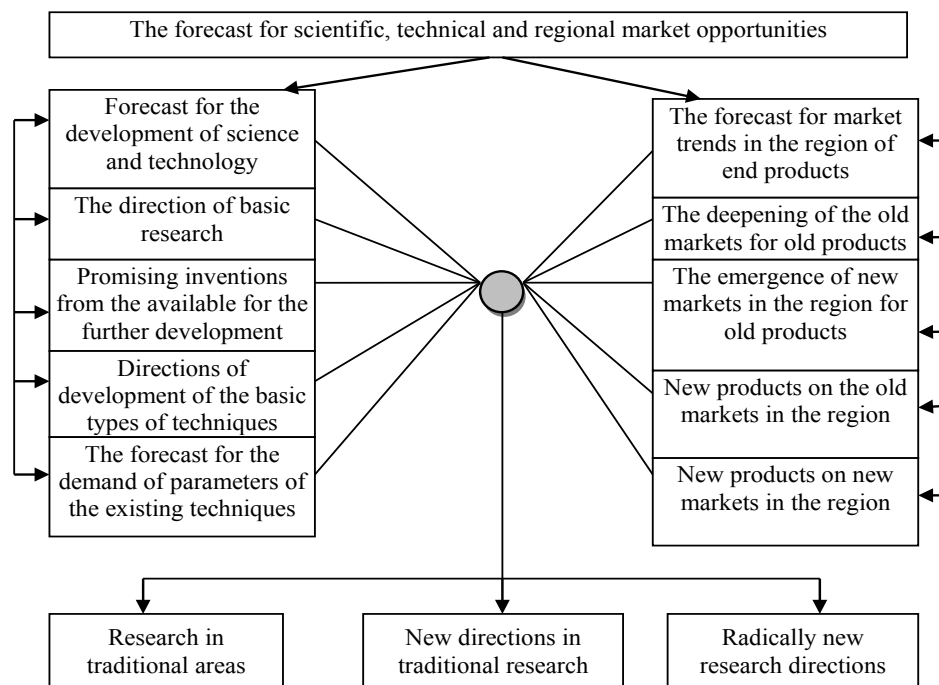


Figure 2 – Scheme of preliminary analysis of the factors affecting the activity of the research organization in the region

This block can be called analytic. It is obvious that for the introducing on the markets and conducting marketing of industrial innovations in the region, it is necessary to conduct its assessment and economic analysis. We consider that the assessment of products is expected to be carried out on a scale: 1 – very bad, 10 – very good. The list of offered estimates includes three main groups of characteristics: general (potential profit, the existing profit, potential competition, size of market, the possibility of patenting, risk rating), marketing (matching marketing capabilities, the impact on existing products, the attractiveness for existing consumer regional markets, potential length of life cycle, resistance to seasonal factors) and production (matching manufacturing capabilities, the length of time before the commercial implementation, ease of production, the availability of labor and material resources in the region, the possibility of production at competitive prices). Within each group several options are being evaluated for each idea on a scale from 1 to 10. The importance of each parameter of products is being evaluated, as they have different effects on success.

For example, the product A – 2,5 points in general characteristics; 2,9 – in marketing; 1,4 – in production. Product B – 2,8; 1,4; 1,8 – respectively. The company gives the following weights: 4 – general, 5 – marketing, 3 – production characteristics.

$$A = 2,5 \cdot 4 + 2,9 \cdot 5 + 1,4 \cdot 3 = 28,7.$$

$$B = 2,8 \cdot 4 + 1,4 \cdot 5 + 1,8 \cdot 3 = 23,6.$$

So, the overall assessment of A is better than B, because of the marketing indicators (the most important characteristic for the firm).

Economic analysis is usually based on an analysis of forecasts of demand, costs, anticipated capital investment and earnings (see Table 1).

Table 1 – Factors considered in the economic analysis of new products

Factor	What is considered
Forecasts of demand	The ratio of sales and prices; the potential short- and long-term sale; the growth rate of sales; seasonality; rates of repeated purchases; intensity of distribution channels
Forecasts of costs	General and relative costs; the use of existing facilities and resources; the ratio of primary and current costs; estimating of future costs for raw materials and other costs; saving of mass production; needs of distribution channels; level of achievement of recoupment
Competition	Short- and long-term indexes showing part of the company and its competitors on the market; strengths and weaknesses of competitors; potential competitors; probable competitors' strategies in response to the company's new products
Required investments	Redeveloping of products ("engineering" the potential search, product development, testing); promotion; production; distribution and marketing
Profitability	Period of covering of start-up costs; short- and long-term, the overall and relative income; control over the price; investment income; risk

It should be noted that the implementation of the whole complex of marketing of science and technology products is the responsibility of marketing services of STO. Among the main tasks of these services are:

- collecting and analyzing information about the state of the micro and microenvironment of STO;
- organization and coordination of conducting forecasting research of trends in the development of science and technology specialization of STO;
- development plans, pricing policies, conducting advertising, commercial realization of completed scientific research and development activities;
- patent-licensing.

In large STO marketing department may be an independent unit, but in small STO this department can be represented by a separate group of planning or production planning department.

Conclusions and directions of further scientific research. The analysis shows that, together with consumers it is advisable to carry out the following activities:

- medium and long term forecasting of emerging trends and technological progress;
- definition of the main technical characteristics of future products and their components (setting minimum and maximum costs associated with the development and release of products, terms of manufacturing and supplying of components indicating their technical and operational characteristics);
- analysis of possible changes of the costs, effectiveness and terms of creating of innovations, alternative courses of action and possible risk;
- preparation of detailed lists of requirements in materials and semi-finished products from aside;
- creation of joint teams of specialists.

Thus, the author has proved that in the process of innovation changes the, from a fairly closed, transformed into an open system ready to accept external changes and rapid contact with other similar systems and subsystems, that must be provided in the state industrial policy.

On the whole, the implementation of investigation of target marketing for industrial innovations requires researches and practical operations having an effect on market formation.

The logic of development of modern enterprise leads to transferring the centre of gravity from new model of management with active usage of the main marketing elements. Further researches of this area require the implementation of the complex of specific marketing efforts with taking into consideration the distinctive features of innovation as commodity without regular bodily form of commodity.

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Особливості маркетингу промислових нововведень у регіоні

У статті досліджено поняття, сутність та специфіку формування системи маркетингу науково-технічної продукції в регіоні. Проаналізовано сучасний стан ринку інновацій у регіонах. Визначено фактори, що впливають на напрямок діяльності дослідницької організації в регіоні. Запропоновано методичні підходи до оцінки факторів, які розглядають під час проведення економічного аналізу нової продукції.

Ключові слова: ринок, науково-технічна продукція, науково-технічна організація, маркетинг, регіональний розвиток.

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Особенности маркетинга промышленных нововведений в регионе

В статье исследованы понятия, сущность и специфика формирования системы маркетинга научно-технической продукции в регионе. Проанализировано современное состояние рынка инноваций в регионах. Определены факторы, воздействующие на направление деятельности исследовательской организации в регионе. Предложены методические подходы к оценке факторов, рассматриваемых при проведении экономического анализа новой продукции.

Ключевые слова: рынок, научно-техническая продукция, научно-техническая организация, маркетинг, региональное развитие.

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