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DEFINING ZONES OF INNOVATION ATTRACTIVENESS FOR SCIENCE-INTENSIVE INDUSTRIAL ENTERPRISE

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Abstract

In the period of accelerated innovative development of industry, it is necessary to work out such an organizational structure of the enterprise, which is able to adapt to constantly changing market conditions. A special role in this process is given to the selection of zones of innovation attractiveness (ZIA), a segment of external environment, which the company is already in contact with (or is planning to come in contact). ZIA are defined as a result of strategic segmentation of the enterprise economic activity. The article offers a methodology of analyzing the competitors' pressure in the sphere of the studied ZIA, which is required for evaluation of profitability of this or that zone. In order to provide for the necessary flexibility of the strategic set of ZIA, marketing experts are offered the methodology of modeling possible events and dynamics of the state of unstable environment, which allows one to evaluate their possible influence upon potentiality and profitability of the selected, approved and balanced ZIA. The work is performed as part of marketing programs aimed at creating a competitive product (technology) and conquering the market of ZIA. The work results in receiving the optimum strategic set of ZIA, which makes the basis for formation of strategic space of the enterprise distribution activity in both short-term and long-term perspectives. The potentiality of ZIA is defined by a set of factors, such as success, profitability and stability (instability) of external environment.

Keywords: Zones of innovation attractiveness; strategic planning; organizational structure of the enterprise; strategy of organizational changes.

1. Introduction

The market has approached to such stage of evolution when technology is used as a means of attainment and preservation of competitive advantages (Goncharov, 2011), when innovations have become a special tool of entrepreneurs; a tool, with the aid of which they use changes as a chance to implement a new type of business or service (Drucker, 2008).

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In these circumstances, it is important for the entrepreneur (manufacturer) (irrespective of the legal status) to have a strategic plan of presenting innovative products to the market. This plan should be developed in keeping with tendencies in a competitive situation, demand fluctuations and other integral parts of the market.

1.1. Problem statement

The system and structure of marketing control at a science-intensive industrial enterprise should offer a real possibility for prospect analysis of the enterprise and identification of factors of its success at the market. In case of a science-intensive enterprise, special place in this process is given to the identification of zones of innovation attractiveness (ZIA), with which the company has come or is only going to come in contact.

Marketing managers of the company need an all-round research of the demand behavior perspectives pre-conditioned by changes in external environment; tendencies in profitability shifts of the enterprise; different kinds of factors able to destabilize the external environment and provoke the uncontrolled growth of economic risks up to a dangerous level.

1.2. Research Objectives

The research objective is to develop proposals concerning optimization of the organizational structure of a science-intensive enterprise management, which would contribute to the accelerated transfer of advanced technologies.

Marketing tools should be tuned to a more general situation with no constraints concerning the type of competition and the life cycle phase of this or that ZIA.

2. Methods

The company deals simultaneously with a fairly large number of attractive ZIA. For each of them, it is necessary to define the position of the company at the competitive market. The nature of ZIA is identical to the nature of the strategic economic zone; however, it is more convenient in operation since it is restricted by the area of innovative product distribution. Therefore, it is possible to define ZIA attractiveness with the methods, which are widely used in marketing: the method of Ansoff (2009), which became widely spread; the method implying the matrix “Attractiveness of the branch -- competitive position”, developed by the consulting company “MacKinsey” for the “General Electric” company, the matrix “Growth – market segment” of Boston consulting group (BCG) and methods of portfolio analysis, which application instructions are published on the web-site of the Academy of Business Safety (ABS, 2016).

To evaluate the future tendency of ZIA profitability, it is possible to apply the principles of competitive pressure analysis, which are similar to the principles used for evaluation of future demand tendencies. Only having extrapolated the current state of profitability, evaluating possible changes in its tendencies and correcting the data of extrapolation, it is possible to receive digital parameters of ZIA profitability dynamics.

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2.1 Formation of a set of zones of innovation attractiveness

The strategic area of the company is first of all characterized by a set of ZIA. They could be defined as strategic only if they meet a set of demands characterizing four major aspects of the company's activity in future:

short-term and long-term perspectives of growth;

short-term and long-term profitability;

strategic flexibility;

synergy effect.

Attractive ZIA are selected based on the analysis of the influence degree of most important tendencies and occasional events in each segment taking into account the data of economic, social, political and technological conditions forecasts. In this case, the research includes such innovations, which are the result of "creative insight of individual inventors and creative re-combinations of ideas… and objects as components of already existing technologies" (Khargadon, 2007), as well as inventions in the form of ideas and innovations as their economic embodiment (Tviss, 1989).

Extrapolation of previous parameters of growth and profitability of ZIA can offer significant help in this respect. Having analyzed the factors defining demand and having corrected the extrapolating conclusions, it is possible to evaluate tentative changes in the current demand behavior and to obtain quantitative evaluation of tendencies in future demand behavior.

Of great importance is the readiness and availability of the zone to master advanced technologies, which are planned to be transferred by the company. Availability factors include the degree of research-and-technology activity development in the zone, qualification of the personnel and its ability to master new technologies.

The set of zones of innovation attractiveness is formed by the marketing managers of the company only out of the zones, which are of explicit interest for the company, i.e. only out of the zones, which take first positions in the rating list and which are approved by the management of the company. Each ZIA in this set is evaluated according to the anticipated level of return on strategic investments. All segments are ranked according to values of this level. The general volume of investment resources, which the company possesses, is supposed to be known. Time resources, necessary for solving strategic problems of the company, are defined. As a rule, this resource appears to be much greater than the realistically possible one.

Functional marketing departments start marketing planning and control, bases, analysis and selection of zones of innovation attractiveness with regional ZIA. Market behavior is analyzed according to types of products and markets; market segmentation; analysis, evaluation and planning of product competitiveness; situational analysis of the company; price calculations and pricing policy; value analysis of products and technologies ready for transfer, as well as commodity logistics.

ZIA with the highest value of return on investment gets investment resources in the amount, necessary for the development of this zone. After that, investment resources are allotted to the next ZIA with the highest value of return on investment (according to its level) and this procedure is repeated until the means are finally exhausted.

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If a major part of the general expenditures of the company is meant for a group of ZIA, which include segments of non-profit activity, then the analysis of all ZIA included from the synergy effect standpoint is required. This analysis will show whether the liquidation of unprofitable ZIA might be the reason for a decrease in profitability of other zones.

If additional investments into some ZIA appear to be less promising than the potential opportunities of diversification for the certain period of time, planned in the investment budget, then the minimum level of return on investments is defined. In this case, a strategic stock of means in case of finance diversification in future is created. The same level is used for evaluation of feasibility of diversification.

Marketing managers of the company need such tools which are able to provide comprehensive analysis of the source set of potential ZIA (each of them treated individually) and formation of a strategic set of ZIA.

2.2 Tools for analysis of potential ZIA

Some ZIA included in the initial set might appear to be less promising, for example, because of the existing difference between short-term and long-term goals and the company's potential. Marketing managers of the enterprise should recommend the company management such a set of promising ZIA which does not cause any doubts in terms of future attainment of the required balance between short-term and long-term profitability of the company's commercial activity.

To solve this problem, a matrix of balance of the innovative product life cycles is created. The following data are used as initial data on ZIA:

a future competitive status of ZIA as part of short-term prospect (up to three years) and long-term prospect (up to seven years);

a market life cycle phase associated with a given ZIA in the near and distant future;

strategic capital investments, which are currently planned for the given ZIA in different phases of its life cycle;

anticipated profits in this ZIA (planned for the nearest and distant future);

scales of ZIA market (short-term and long-term planning);

a company segment in the market and the level of sales within the given ZIA (short-term and long-term planning).

In the matrix of balances, the control values depend on the aims accepted by the management of the company, persistence of the management and pressure of the most influential groups of the shareholders, as well as on resources required to compensate the difference between anticipated results and the control values. They could be strategic investment resources, which the company could mobilize besides the resources spent to provide high short-term profitability.

Each ZIA contributes to the control values stipulated for each phase of its life cycle (LC). The data of annual forecasts regarding each ZIA and each phase of its LC should correspond to the control values of the annual sales volume and annual profits. It is necessary to find out how currently planned investments "overlap" the corresponding phases of LC. If the planned values in some parts of the matrix appear to be higher than the available resources, it would be necessary to attain required equalizing.

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It is necessary to provide an opportunity of steady development of a set of ZIA. For all newly emerging ZIA (which are often not profitable at the first stages of LC), it is necessary to possess certain resources to ensure that at its mature stage, each promising ZIA could offer an efficient output for the company.

When balancing is performed, an initial set of ZIA could be corrected: some ZIA could be reduced and others could be broadened, while some ZIA would have to be rejected.

The work with the matrix of balance is automated based on the mathematical programming procedures. These procedures are implemented via applied programs of the marketing information system module, which provides the development of the strategy of the company's commercial activity.

A set of promising ZIA balanced according to life cycle phases should be elastic and flexible. In other words, it should be characterized by certain resistance to unexpected changes. In order to provide the necessary flexibility of a strategic set, marketing managers are offered the methodology of modelling possible events and dynamics of the state of unstable environment, which enables one to evaluate their probable influence upon potentiality and profitability of the selected, approved and balanced ZIA.

3. Results

3.1 Strategies of organizational changes

The work is performed as part of the marketing program aimed at creating competitive products (technologies) and commercialization of these products.

Science offers numerous models of development of an organization (for example, models of A. Downes, Thorbert, Lieden, Miller and Friesen, Katz and Kahn and many others**)**. The models of Adizes (2012, 2013) and Greiner (2002) are most widely spread in the world practice. The revolutionary strategy has been chosen out of all types of strategies of organizational changes in the investigated company, since it provides quick formation of the organizational structure of the enterprise, including the structure of marketing control for regional and inter-regional markets.

The latter should proceed in stages, however, fairly quickly:

at first, functional branch-oriented, functional market-oriented and functional product oriented substructures (in case there are marketable goods or technology) are created in a linear functional manufacture-oriented structure through targeted implementation of the marketing system;

with a wider development and improvement of the marketing system, the enterprise should pass over from the three above-listed substructures to commercial, market and branch substructures (respectively), which do not have strong functional restrictions and which are fairly able to provide sustainable development and improvement of marketing-based methods of management;

after that, the organizational structure of the enterprise could be converted into a matrix one, with explicit branch, market and commercial substructures.

General management of the programs is provided by the marketing programs director, who is empowered to develop a marketing strategy of the whole company, to manage corresponding resources and staff that take part in the program development. Heads of functional departments of marketing service

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responsible for the professional level of development and managing individual marketing programs, bear entire responsibility (each of them – for his or her program), report to the marketing programs director.

The main task of the managers of functional departments in marketing administration consists in concentration of efforts on long-term programs for development of competitiveness and profitability of the company, accurate organization of work of marketing managers aimed at attainment of most professional and efficient solutions at all stages of preparation and implementation of marketing programs.

The following specialists could be appointed to the position of a marketing programs director in keeping with the degree of development of marketing activity:

majoring in a commodity group from manufacturing with the functional product-oriented or commodity structure, having commercialized products or technologies;

majoring in regional markets from manufacturing with the functional market-oriented or market structure;

majoring in a branch of industry with a functional branch-oriented or branch structure, as well as specialists from scientific and technical, manufacturing, financial, marketing or other subdivisions dealing with company management. In keeping with the principles of creating a matrix structure, they stay in double subordination:

- (in terms of developing the marketing program throughout the whole working period) they report to the marketing programs director;

- (in terms of current issues of manufacturing activity) they report to their direct heads according to the hierarchical structure of the company. Professional marketing managers are either included in the groups performing certain programs, or help them, staying in functional departments of the marketing administration. Besides, the groups include specialists of different areas of knowledge with versatile work experience ready for joint activities “in the team”, who are creative, active and able to efficiently cooperate with professional marketing specialists. The experience of the enterprise in using such groups for science-and-technology projects might serve as a good basis in group formation for successful solution of strategic marketing problems, as well as a good example of active use of matrix structures.

The matrix structure provides an accurate subdivision of administrative and professional responsibility for the performed programs, contributes to efficient solution of such issues as expansion and support of business, guarantees active following the company’s goals both in short-term periods and in long-term prospect.

Based on factors, defined in advance, reflecting efficiency and potentiality of the researched zone, strategic segmentation of the external sphere of industrial activity is performed, and the probability and feasibility of it including the set of ZIA is determined. This approach enables us to take different significant factors into account: a geographical region, demand of the zone for the given product (technology), a type of consumer, a number of strategic resources of the zone, etc.

The performed work results in getting an optimum strategic set of ZIA, which constitutes the basis for strategic space formation of all types of the company’s distributive activity both in near-term outlook and in the distant future. Potentiality of ZIA is determined by a set of success factors – demand growth rate, profitability and stability (instability) of external environment. A three-dimensional color bar chart is created for each of these factors, in which:

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- development of demand is determined by the size of the product (technology) market within ZIA, its purchasing power and trade barriers;

- profitability is determined by the buying habits, a type of competitors, intensity of competition and distribution channels;

- economical, technological and social and political factors are taken into account in determining the stability (instability) degree.

Market counterparty (whether these are buyers, suppliers or investors) and the governance institutions consider ZIA to be an integral image of the company. A general level of ZIA attractiveness is determined in comprehensive analysis of demand growth prospect preconditioned by changes in external environment; tendencies in profitability shifts, different factors are able to destabilize external environment and provoke the uncontrollable growth of economic risk up to a dangerous level.

The marketing system identifies the most promising directions in the activity of the enterprise and clearly defines factors of its success at the market according to corresponding evaluations of ZIA attractiveness and a competitive status of the company. Based on these generalized indices, competitive positions optimum for this company are outlined in advance. The efficiency of an innovative company strategy will grow together with its integration and focus on cooperation within existing external environment (Volkova, 2013). In this case, only the level of instability of external environment could be considered as a natural constraint.

The primary evaluation of ZIA is the index of attractiveness. These index values are calculated based on the score evaluation of profitability, growth of demand and overall instability of environment, given in the bar chart. As a result, a definite competitive strategy (or possible types of strategies) corresponds to each attractive ZIA. The nature of the strategy is easily found with the aid of special matrices, which describe the structure of the index values area characterizing ZIA attractiveness and the competitive status of the enterprise. Selected attractive ZIA are checked for potentiality in terms of the rate of income growth on investments and for correspondence to time restrictions.

A valid option set is formed out of all potential ZIA. Each option is a set of ZIA, which is strategic for the enterprise, if this option matches definite demands concerning growth rates, profitability, flexibility and synergy effect, planned for the nearest and distant future. In order to include only promising zones, it is necessary to use only the matrix of the balance of the ZIA life cycle, which enables us to define the possibility of attaining the required balance between short-term and long-term profitability of the industrial activity of the company in future.

Options of ZIA sets, which are prospective and balanced in terms of life cycles, should be flexible and resistant to unexpected changes. To evaluate the level of flexibility of each studied variant, simulations of possible unexpected events, situations and states of non-stable dynamics of environment take place to analyze their possible influence on potentiality promising the previously approved ZIA.

In an uncertain environment and severe competition, strategic sets of Zia are characterized by a synergetic property. If its level is sufficiently high, some ZIA from the strategic sets are characterized by an ability to form useful system-based properties.

Each strategic set of ZIA, proposed by market consultants of the enterprise, has a definite system of complex parameters both for near-term and long-term outlook. A strategic set of ZIA, which is the best

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for the given enterprise, is selected using methods of decision-making under risk and uncertainty conditions.

4. Conclusion

As a market situation these days and in the nearest future cannot be called realistic, priority factors for the enterprises of this country are the factors that define the zones of innovation attractiveness (ZIA) and are based on the analysis of external environment segments. The article offers an algorithm to form a set of zones of innovation attractiveness and tools for their potentiality analysis.

The article proposes methods to form such organizational structure of the enterprise which is able to adapt under constantly changing market conditions. It is feasible "to grow" a new structure based on the existing one through changing and expanding it, gradually placing new accents of fundamental importance. Instead of traditionally used methods of management, oriented towards functioning and manufacturing, new methods focused on the innovation market and the buyer are applied, gradually widening the boundaries of the market (Chudesova, 2012).

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