FEATURES OF INNOVATION MANAGEMENT STRATEGIES IN THE POST-INDUSTRIAL ECONOMY

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ABSTRACT

The topic of this paper is very relevant in relation to the formation of the post-industrial economy and the need to improve the methods, tools and mechanisms for managing economic entities. The main reason for the low efficiency of economic entities now is that the prevailing stereotypes of management and applied management methods do not meet the modern requirements of the market economy. The aim of the paper is to develop a classification model of innovation management strategies in companies that allows companies to justify the choice of a specific strategy and the scope of strategies. The results of the study were obtained through descriptive and comparative methods of research. The paper analyzes the main concepts of companies' competitive strategies and systematizes the specific features of economic entities' strategies of closed, open and half-open innovations in accordance with the following characteristics: content, tasks, advantages, disadvantages, current distribution, attitude to creation and use of the ideas. The factors of the change of modern companies' interest in the innovation activity towards the open innovation model were classified: the growth of mobility and the level of education of employees, the intellectualization of production processes, the high cost of innovation, the improvement of the venture capital availability and the emergence of new information and communication opportunities. It was substantiated that the intensity and efficiency of the innovation transfer to the production sphere, as well as the efficiency of the economic activity of modern companies, are determined by their innovation activity strategies. The classification of modern companies' innovation activity strategies was developed based on three parameters: technological potential, market potential and the degree of innovation life cycle management, which made it possible to identify the areas of effective application of the open, combined and closed innovation strategies in the real-case scenario of economic entities. Real-world application of the results of this work will improve the ways for strategic management of innovative development of companies taking into account some modern economic and social trends.

Keywords: Market Potential, Technological Potential, Innovation Life Cycle, Open Innovation Strategy, Half-Open Innovation Strategy, Closed Innovation Strategy.

INTRODUCTION

Currently, while the post-industrial economy is becoming established, the role of information and knowledge in ensuring the efficiency of the economic activity is sharply increasing (Nizhegorodtsev, 2016). There is no doubt that information and knowledge constitute another production factor, which differs significantly from the traditional ones-labor, land and capital (Hirschhorn, 1988). In modern conditions, the effectiveness of information and knowledge management determines the effectiveness of the economic activity and the entire economy as a whole (Carayannis & Grigoroudis, 2014). New methods and technologies are required to manage this production factor.

Recently, a great attention has been paid in foreign and Russian scientific papers to various aspects of the innovation activity management of the economic entities: marketing support, planning, intellectual property protection and transfer of the innovations (Salamzadeh, Yousef Nia, Radovic Markovic & Salamzadeh, 2016). The leaders of most high-tech companies are interested in fresh ideas that contribute to the increase in the market share occupied or identification and entering the new market niches (Sikyr, 2015). There is a reduction in the number of research and development projects unclaimed in the market, as a result of the active application of the foresight research in the course of initiation of the ideas in the promising areas of science and technology development (Sweet, 2001).

The innovative activities management of modern companies should be aimed at achieving both strategic and tactical goals; moreover, it should result in the increase in their economic potential and contribute to the emergence of competitive advantages (Cohen & Zysman, 1987). The efficiency of innovation activity management determines all the final performance results of the economic entity, while the organization of its innovative activities is possible only through the coordination of the interests and actions of all its structural units (Sekerin et al., 2015). It seems advisable to consider in more detail the competitive strategies for the innovation development of modern companies, systematized by the criterion of necessity and the possibility of protection of the created and used intellectual property: a strategy of open, half-open and closed innovation.

The authors are going to analyze the main concepts of competitive strategies of companies based on the descriptive and comparative methods of research; some specific features of closed, open, open-ended innovations of economic entities are systematized; the factors of changing the interests of modern companies in the innovation activity to the open innovation model are classified.

METHODS

The competitive strategies that ensure the innovative development of modern companies can differ both in their main aspects and in the goal-achievement tools and technologies. The most famous and successful concepts that ensure the formation and implementation of competitive strategies are compared in Table 1.

Table 1
THE CONCEPTS OF COMPETITIVE STRATEGIES AND THE KEY SUCCESS FACTORS OF THEM

Concept	Founder	Key success factors	Key aspect of the strategy
The concept of competitive forces analysis (Porter, 1985)	M. Porter	The success is determined by the formation of competitive advantages and their use	Understanding the market structure
The concept of innovative development (Drucker, 1985)	P. Drucker	The success is determined by the right choice of the strategy in the technology and skilled labor markets	Innovation management
The concept of key competencies of the company (Hamel & Prahalad, 1994), (Hamel, 2000)	G. Hamel & K.K. Prahalad	The success is determined by the formation and development of the key competencies	Intellectual leadership
The concept of market leadership (Treacy & Wiersema, 1995)	M. Treacy & F. Wiersema	The success is determined by the product excellence, product leadership and proximity to the consumer	Market superiority
The concept of cyclic self-organization (Deming, 2006)	W.E. Deming & W. Schuhart	The success is determined by the ability to self-organization in accordance with the life cycles of the resources and institutions involved	Cyclical change management
The concept of market evolution (Nelson & Winter, 2002)	R.R. Nelson & S.J. Winter	The success is determined by the ability to evolve synchronously with the external environment, anticipating its changes and outstripping them	Company development management
The concept of ecosystem formation (Moore, 1996)	J.F. Moore	The success is determined by the ability to combine the efforts of various agents to achieve the common goals	Collaboration management
The concept of game strategies (Brandenburger & Nalebuff, 1996)	A.M. Brandenburger & B.J. Nalebuff	The success is determined by the ability to identify, form and maintain a dominant strategy in the markets	Business rules management
The concept of competitive rationality (Dixon, 2004)	P. Dixon	The success is determined by the ability to develop and use the internal organizational capacity	Enterprise management

Developed by the authors.

In addition to the above, the development of competitive strategies of the modern knowledge-intensive business was significantly (although not systemically) influenced by the concept of "Six Sigma", E.M. Goldratt's theory of constraints, G. Itskovich's "triple helix" concept, the concept of regional clusters and other theoretical constructs in the field of strategic and innovative management.

The companies following the principles of the above strategic management concepts are not listed by the authors deliberately, since this list, notwithstanding the principles of its composition, will be knowingly subjective and incomplete.

In the modern business environment, it is not enough to use only the internal potential of the company along with the appropriate management methods to organize the effective innovative activity; it is required to create the effective interaction of the company with external contractors, which involves the exchange of ideas and developments (Coyle, 1999).

Back in the middle of the last century, large world companies used a linear model of the innovation life cycle, where the whole chain of implementation and creation of the innovation

was implemented within the company from the stage of creation of a new idea or product up to their final target market launch and the subsequent after-sales service. Large companies collected the best scientific and technical personnel from the market and launched a full research and development cycle (Zhang & Yang, 2013). In modern scientific papers, in this case, they talk about the use of the closed innovation model. In due time, this model was successful not only in terms of commerce, but also in terms of the scientific achievements (Zemlickiene & Maditinos, 2012). But with the growth of the integration processes intensity as well as the complexity and the cost of the scientific research, with the increasing mobility of the labor resources, in the world economy the significant shortcomings of the closed innovation model were found out. Therefore, at the end of the last century the increasing number of companies began to come to the conclusion that the classical business model of innovation should and can be modified through active interaction with the outside world in terms of sharing knowledge and innovations.

RESULTS

The content of the strategy of closed innovation can be distilled down to the following: the entire innovation process (from creation to commercialization of the innovations, including the after-sales service) is implemented within the enterprise, all the developments obtained constitute a trade secret, companies do not consider any external sources of innovation (new ideas and technologies) in principle; the priority task of the research and development sphere of these enterprises is the generation and commercialization of innovations for the known industry markets. Intellectual property management is based on the control over the intellectual property, the prevention of any leakage of the ideas from the companies, while it is characteristic that the R & D results obtained are used and are profitable and, as a rule, in the competition, the winner is the one who first launched innovation in the market.

The main idea of the open innovation strategy is the achievement of the profit growth due to the management of the targeted information flows and the knowledge that facilitates the acceleration of internal innovation processes and the dissemination of the results in the field of research and development outside the enterprise if they are not required by the company itself (Kanter, 2001). Intellectual property management is focused on obtaining maximum profit from using the company research and development results by other economic entities. In the competitive struggle, the winner is the economic entity able to implement a more productive business model as against the one who first launched the innovation in the market.

The content of the half-open innovation strategy is based on the idea that one part of the technical solutions developed at the enterprise should be protected and the other part should be accessible to the users to be applied free of charge, thereby implementing the individual stages of the life cycle of this technology (Nizhegorodtsev & Goridko, 2016). Modern companies develop and implement a differentiated approach to innovation life cycle management: they control only certain stages of the specified life cycle and the remaining stages are accompanied and provided by other agents. Table 2 represents the comparative characteristics of the open, half-open and closed innovation strategies.

Table 2
THE COMPARATIVE CHARACTERISTICS OF THE OPEN, HALF-OPEN AND CLOSED INNOVATION STRATEGIES

Characteristic	Closed innovation strategy	Open innovation strategy	Half-open innovation strategy
Period of occurrence	The 1980s, W. Lichtentaler (Frentz & Lambert, 2008)	(Chesborough, 2003) (Chesborough, 2007)	The beginning of the 21st century, many software vendors
Benefits of the strategy	The model is successful both in terms of innovation commercialization and in terms of the generation of new scientific achievements	R & D costs reduction; the optimal business models for new markets creation; profit from own developments licensing	Flexible attraction of external specialists, the optimization of financial resources
Disadvantages of the strategy	Long payback periods, duplication of research, inefficient research and development results management	The reduction of the protection degree of the intellectual property created, the need to expand the innovation strategy horizon beyond the company	The complexity of implementation of the differentiated approach to innovation life cycle management
Scope of application	Strategically important innovations able to create undeniable competitive advantages and developed only by the own R & D divisions	The innovations that can be implemented in the form of licenses	The innovations are created within the company, but the individual structural elements of these strategies can be developed by the third-party counterparties
Type of economy	Industrial Economy	Knowledge economy (post-industrial economy)	Transitional to the post-industrial economy

Developed by the authors.

Figure 1 represents the classification of the innovation activity strategies for the companies based on three parameters: technological potential, market potential, the degree of innovation life cycle management, making it possible to identify the scope of efficient application of the open, half-open and closed innovation strategies in the real-case scenarios of economic entities.

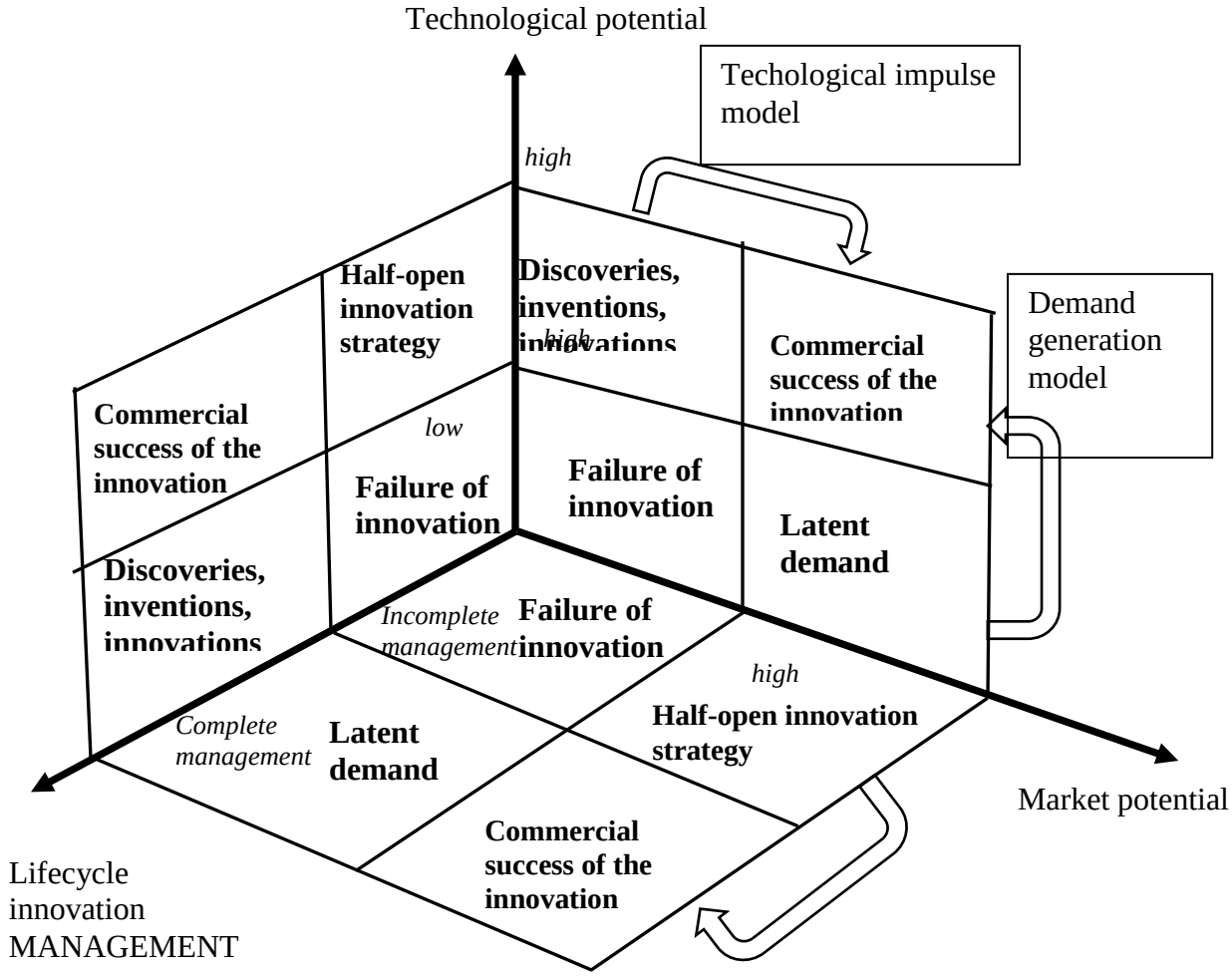

Figure 1
THE CLASSIFICATION OF THE INNOVATION ACTIVITY STRATEGIES FOR MODERN COMPANIES (DEVELOPED BY THE AUTHORS)

DISCUSSION

The following prerequisites for the transition of companies' activities to the open innovation model are formed in modern conditions:

1. The increase in the degree of mobility and educational level of employees in the field of research and development, as a result of which it is difficult for enterprises to keep secret the scientific research results,
2. The high costs of the scientific research,
3. The opportunity to save the "false negatives" (they are understood as the research results, which in the early stages are not evaluated as promising, but which may be a great success after commercialization),
4. The intellectualization of the production process,
5. The increase of the venture capital availability,
6. The development of the spin-off model,
7. The increase in the intensity of the economic integration and globalization processes,
8. The emergence of the post-industrial economy, accompanied by the rapid dissemination of knowledge and information,
9. The increase in the number of research and development results,

10. The emergence of new information and communication opportunities that improve the quality of the market dynamics forecasting and the increase in the flexibility of economic entities in the market conditions.

Russian science-intensive companies are not very active yet in developing and implementing the half-open innovation strategy (Petukhov & Nizhegorodtsev, 2016). However, the application of this management technology in the real-case scenario promises the significant opportunities for interaction and establishment of the long-term economic ties with the agents interested in collaboration both in the scientific research and in the processes of commercialization of the developed innovation (Marx, Gans & Hsu, 2014).

One of the possible ways for the innovation of Russian companies to enter the Western markets is to invest in the foreign start-ups.

In general, for science-intensive corporations, the application of the half-open innovation strategy will provide an opportunity to attract the external experts flexibly, as well as to attract new ideas and technical solutions.

The application of the half-open innovation strategy within the framework of value chain management makes it possible to launch a mechanism for collection and expert assessment of internal and third-party proposals for innovative projects and solutions that ensure the creation and promotion of globally competitive products and technologies to the market.

CONCLUSION

Such a simple dilemma-either innovation is closed or open-does not correspond to the reality of modern production processes, in which the company-innovator monitors the individual stages of the life cycle of the innovation, created by it, allowing other agents to develop and maintain other stages of its life cycle.

In modern conditions, none of the considered strategies should be completely neglected, since each of them can be economically feasible in a certain section of reality.

The purpose of this study is to develop a classification model of innovation management strategies that allows companies to justify the choice of a specific strategy and the scope of strategies. Here, the main concepts of competitive strategies of companies are analyzed based on the descriptive and comparative methods of research; some specific features of closed, open, open-ended innovations of economic subjects are systematized in accordance with the following characteristics: content, tasks, advantages, disadvantages, current scope, attitude to creation and use of ideas. The factors of changing the interests of modern companies in the innovation activity to the model of open innovations are classified: the growth of mobility and the level of education of employees, the intellectualization of production processes, the high cost of innovation, increasing the availability of venture capital and the emergence of new information and communication opportunities. It is substantiated that the intensity and efficiency of the transfer of innovations to the production sphere, as well as the efficiency of economic activity of modern companies are determined by the strategies of their innovation activity. The classification of innovative activity strategies of modern companies is developed based on three parameters: technological potential, market potential, degree of innovation life cycle management, which allows to identify areas of effective application of open, combined and closed innovation strategies in the practical work of economic entities. Real-world application of the results of this work will improve the ways for strategic management of innovative development of companies taking into account modern economic and social trends.

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This article was originally published in a special issue, entitled: **"Innovative technologies, Industrial development, Agrarian policies, Resource management and Sustainable strategies towards the economic growth of the Russian Federation "**, Edited by Grigorios L. Kyriakopoulos.