

Transformation of an Open Innovation Model Under Conditions of the Modern Business Environment

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Abstract—The modern management theory indicates a growing trend in using business modeling as a key managerial innovation. The processes of growing globalization, digitization, offering a new service as an inherent value or supplement to the product make up a sphere of interdisciplinary research being at the intersection with an open innovation theory; concepts of knowledge management, servitization. The purpose of the author's study is to study open innovation model transformation in the modern business environment. The article presents the main results of the innovation activity analysis made for the Kurgan region enterprises for the period of 2014-2018. The conclusion is made that regional enterprises operate mainly on the principles of a closed innovation model. Establishing the correlation between the concepts "an open innovation model" and "an open business model", the author considers the latter as development of an open innovation model in the modern business environment. Summarizing the approaches presented in the scientific literature, the author sets up the typology of open innovative strategies.

Keywords—business model, open innovation model, knowledge management, servitization, open innovation strategies.

I. INTRODUCTION

The surveys of the top managers from the world's largest companies [1] indicate that today innovative business models as a source of competitive advantage are more preferable than novel products and services. In the context of growing globalization, mutual penetration of industries, rapid development of information and communication technologies, innovations in business models can drastically restructure business methods, "rewrite" industry standards, and create a complex and specific behavior model for an individual company, impossible for competitors to imitate.

II. LITERATURE REVIEW

The rationale for the study of business models is starting a new round due to the processes of globalization, economy digitalization, capabilities of modern information and communication technologies.

To confirm this trend, we are going to consider the directions of modern research in the field of business modeling, presented by the data in Table 1

TABLE I. DEVELOPMENT OF DIRECTIONS OF BUSINESS-MODELS RESEARCH [2]

Year, Representatives	Direction of research									
	Business-model and company results	Business-model in context of networks and partnership	Generalization of previous work of key trends	Interdisciplinary character of business-models	Sectorial generalization	Business-model and company strategy	Metrics for assessment of business-model	Innovations and change of business-model	Definition and structure of business-model	Business-model in «electronic business»
1998, Timmers										+
2000, Malhotra, Kraemer								+		+
2002, Dubosson, Margretham, Chesbrough, Osterwalder						+	+			+
2003, Gilbert					+					
2005, Shafer, Morris, Tikkanen				+	+	+				
2006, Keen		+	+							
2007, Chesbrough								+		
2008, Zott, Amit, Johnson		+	+			+	+	+		
2010, Demil, Teece, Nenonen		+	+			+	+	+		
2011, Zott, Amit, Vives		+	+	+		+		+		
2012, Hajiheydari, Solaimani		+		+						
2013, Coombes, Nicholson, Guo, Zhao, Tang, Shirokova, Shatalov, Bocken	+	+						+		

The first scientific publications on the problems of business modeling date back to the beginning of the 2000s, since 2010 their rapid growth was observed, in 2015 the total

number of publications in the SCOPUS scientometric database reaches 349 [3].

From 2006-2007, the researchers focused on studying business models in the context of networks and partnerships, as well as innovative changes in business models (Table 1).

In the course of scientific research, a consolidated opinion regarding the definition of the business model has not yet been formed. At the same time, the scientists and practitioners agree in recognizing the value component dominance in the definition of "the business model".

Today, more than ever, the value is created jointly by participants in intercompany interaction (suppliers, manufacturers, participants in distribution channels, consumers). As a result, the business model goes beyond the boundaries of an individual company, and, for its analysis, it is necessary to consider the value chains that go beyond the boundaries of the company, including intercompany networks [4].

Among the external factors affecting the development of the subject under research, we consider it is necessary to note the factors such as emergence of digital technologies [5,6], offering a service as an independent value or complement to a product [7].

The abovementioned trends in changing the business environment make up the sphere of interdisciplinary research, which, in particular, is at the intersection with the theory of open innovation; the concepts of knowledge management [8], servitization [9,10].

"Open Innovations" as a new paradigm of innovation management is developed in the works of H. Chesbrough, Van W. Haverbeke [11-14].

M. Frenz and R. Lambert [15] devoted their work to a comparative analysis of national practices of open and closed innovations. The work of A.A. Bykova, M.A. Molodchik [16] is devoted to the study of an open innovation practice in Russia (in particular, an impact of intercompany interaction in the field of R&D on indicators of company financial performance).

However, the research of innovative practices is not sufficiently developed both from the point of view of theoretical and methodological aspects and from the point of view of a critical mass of empirical works. Insufficient attention is still being paid to the study of the practices that form one or another model of the organization innovative behavior.

The issues of the relationship between the concepts of "an open innovation model" and "an open business model", correlations and interconnections of a business model and company strategies remain debatable.

III. RESEARCH METHODOLOGY

The methodological basis of the author's research is the systemic, synergetic, situational and institutional approaches, the methods of dialectic and integrated study of interacting objects that allow us to identify, classify, analyze and model the processes of innovation and knowledge management. The main results are obtained on the basis of analysis and synthesis methods, classification and modeling, functional, comparative, cluster analysis, application of economic and statistical research methods.

IV. RESULTS

The purpose of this research is to study transformation of an open innovation model in the modern business environment.

In the earlier studies, the author identified models of innovative behavior of enterprises, defined a set of characteristics (criteria) and their qualitative assessments, which (type) of the model of innovation activity [17,18].

In particular, an innovative practice, characterized by a combination of using the results of mainly internal research and development (R&D), controlling provision of intellectual property rights through registration of patents, industrial designs, utility models, concluding confidential agreements with company personnel and (or) third-party organizations, is identified by the author as a closed innovation model.

Innovative practice, based on collaborative research and development, cooperation in the creation of innovations, strategic use of intellectual property rights (patent pools, purchase and sale of patent licenses), commercialization of the results of external research and development work, we have identified as an open innovation model.

The author conducted a comprehensive comparative analysis and assessed the innovative activities of regional enterprises applying open innovation methodology.

Based on the results of the innovative activity of the Kurgan region enterprises for the period 2014-2018, based on statistical information [19], the following conclusions are made:

1) Technological innovations consistently prevail in the innovation structure of the Kurgan region enterprises, and acquisition of machinery and equipment predominate among the types of innovation activity. So, in 2018, 42.0% of the total technological innovation costs made the costs for acquiring machinery and equipment.

2) In terms of the innovative activity management, no due attention is paid to measures for personnel development, introduction of corporate knowledge management systems; participation in strategic alliances, partnerships and other types of cooperation with consumers of products and services, suppliers, domestic and foreign manufacturing companies. In 2015-2018 no more than half of innovation-active organizations implemented measures on personnel development, only a few organizations introduced organizational innovations in each of the other areas of innovation activity indicated above.

3) Enterprise management does not consider the policy of borrowing innovation institutions as a tool for managing innovative activities. The statistics records a low level and a decrease in the activity of technological innovation exchange with other enterprises. Technological exchange is reduced mainly to equipment acquisition. In particular, in 2018, out of nine participants in the technological exchange, five enterprises purchased 25 units of equipment and 33 new technologies.

The scope of the practice of acquiring property rights to patents, licenses to use inventions, industrial designs, utility models; targeted recruitment of qualified professionals does not meet the requirements of an open innovation model, the

trends in developing knowledge-based economy. Statistical studies note isolated cases of using certain types of innovative practice each year of the analyzed period.

4) A low level of enterprise cooperation is observed in the processes of innovation development. So, in 2018 only every the fourth organization developed innovations together with other organizations, 40.5% of enterprises did this only themselves; 28.6% of participants in innovative activities used the services of third-party organizations.

In the majority of implemented joint R&D projects, the partners were domestic companies and only in some cases foreign ones.

5) The attention of managers is focused on internal sources of knowledge and innovation (Fig. 1).

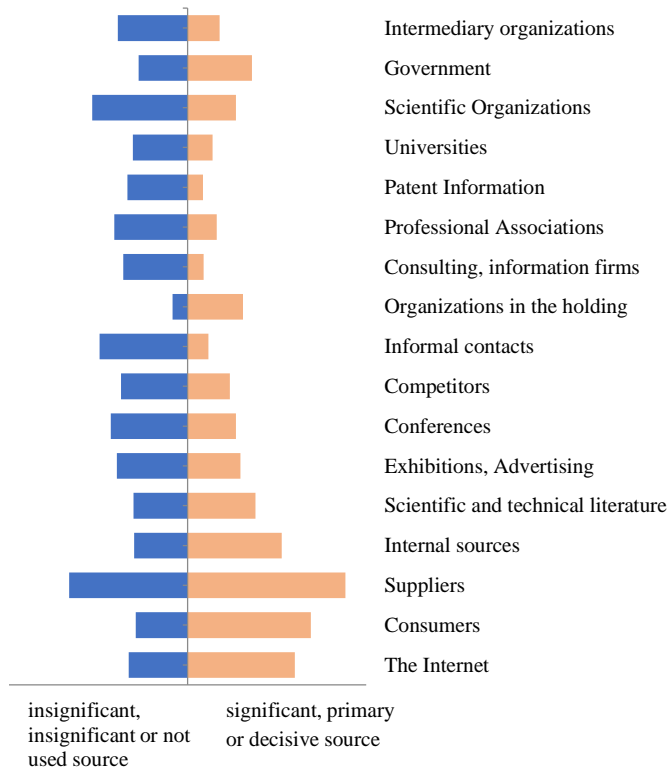


Fig. 1. The number of organizations that rated the sources of information for innovation by importance (compiled by the author according to [19]).

The main external sources of innovation are suppliers of equipment, materials, software; consumers of goods, works, services; internet sources.

In the innovative activity of Kurgan region organizations, the potential of scientific organizations of both industry and academic profile, universities, consulting and information companies is poorly used. Specialized innovation institutions are poorly involved in the innovation processes of enterprises; business does not position them as priority sources of innovation.

6) Technological innovation financing is carried out mainly at the expense of the organizations' own funds (for example, in 2018 this source accounted for 83.5% of the total costs of technological innovations, in 2017 - 85.7%), there is no venture capital funds in the sources of technological innovation financing in the analyzed period.

Thus, organizations of the Kurgan region show no tendency to realize the advantages of the open innovation model in their innovative practice.

As mentioned above, the question remains open about the relationship between the concepts of "an open innovation model" and "an open business model". In our opinion, an open business model should be seen as development of an open innovation model.

An open business model not only places emphasis on the priority sources of the knowledge used, but also determines the position of partners in the processes of creating, offering and acquiring the value. Without answering these questions, open innovation model implementation in practice is impossible.

According to the author, the issue of correlation and interconnection of a business model and the company's strategy is more complex and requires a separate consideration. In the framework of this study, we believe that these concepts are complementary, should be harmonized; "a business model" should be considered as a more general category than "the strategy".

Application of modern conceptual approaches to the company innovative activities management become easier due to availability of ready-made standard decision-making models.

We propose the following typology of open innovation strategies, presented in Table 2 (developed on the basis of [20]).

TABLE II. OPEN INNOVATION STRATEGIES

Degree of external knowledge application	Degree of "width" (diversity) and / or "depth" of the external knowledge involved	
	low	high
Insignificant (low)	Marketing innovation strategy	Mutual innovation strategy
Significant (high)	Crowdsourcing innovation strategy	Network Innovation Strategy

A marketing innovation strategy is focused on profitability, it involves external knowledge acquisition through purchasing licenses, outsourcing research and development, purchasing startups.

A crowdsourcing innovation strategy suggests involving individual experts, expert communities, including users, in solving the problems of organization innovation activity; using their creative abilities, knowledge and experience based on information and communication technologies.

The practice of enterprises in the Kurgan region, in particular, illustrates the relevance of using crowdsourcing innovation strategy. So, in 2016, in ranking external sources of information used by Kurgan region enterprises which form innovation policy, the consumers of goods, works, services took the second place. Every fourth enterprise surveyed identified consumers as a significant, main or indispensable source of information used in the innovation policy formation [19].

The strategy of collaborative innovation is implemented through cooperation with a certain circle of partners, their deep integration into the organization innovation processes.

The network innovation strategy is based on the intensive use of external knowledge through the deep integration of a certain circle of partners: suppliers, research organizations, and representatives of the user community. The implementation of this strategy involves formation of an open innovation platform.

It is not difficult to assume that in the digital economy, it is the network innovation strategy that will be in demand. The platform form of business organization will ensure the unity of technological standards, transition from the goal of maximizing economies of scale to network effects.

V. CONCLUSION

In the light of modern trends in the business environment development and management science development priorities, the analysis of the innovation activity of Kurgan region enterprises showed that the enterprises operated mainly on the principles of a closed innovation model, which reduced innovation effectiveness.

To commercialize the results of innovation, it is necessary to ensure a greater orientation of the academic structures and universities' scientific departments to work with external customers so that knowledge and technologies go beyond them. To accelerate the process of sharing knowledge requires formation of institutions for knowledge dissemination, knowledge transfer from the scientific environment to a real sector of economy.

The author establishes correlation between the concepts of "an open innovation model" and "an open business model". It is proposed to consider an open business model as a development of an open innovation model. Unlike an open innovation model, an open business model, placing emphasis on the priority sources of the knowledge applied, also determines the position of partners in the processes of creating, offering and acquiring the value.

The open innovation strategies typology is worked out in the article.

It should also be noted that it is difficult to analyze modern trends on the basis of statistical information in the field of organizations' innovation activities; it requires adapting the forms of state statistical reporting to modern trends in the business environment.

REFERENCES

- [1] IBM Global CEO Study. Expanding the innovation Horizon, 2006. <http://www-935.ibm.com/services/us/gbs/bus/pdf/ceostudy>
- [2] O. A. Tretyak and D.E. Klimanov, "Business-models: main directions of research and search for content base of concept," Russian management journal, Vol. 12, No 3, pp.107-130, 2014. (in russ.)
- [3] N. N. Bek and L.R. Gadzhaeva, "Open innovation business models and open strategies: features, challenges, development prospects," Vestnik Moskovskogo universiteta. Seriya ehkonomika, No. 1, pp. 140-151, 2018. (in russ.)
- [4] D. E. Klimanov, "Marketing approach to the analysis of business-models," FSAEIHE National research university High school of education, 2017. (in russ.)
- [5] F. Gunzel and A. Holm, "One size does not fit all - understanding the front-end and back-end of business model innovation," International Journal of Innovation Management, Vol. 17, No. 1, 2013. <https://doi.org/10.1142/S1363919613400021>
- [6] S. V. Orekhova, "Industrial enterprises: Electronic vs. Traditional business model," TERRA ECONOMICUS, Vol. 16, No 4, pp. 77-94, 2018. <https://doi.org/10.23683/2073-6606-2018-16-4-77-94>
- [7] V. Velamuri, B. Bansemir, A.-K. Neyer, and K. Moslein "Product service systems as a driver for business model innovation: lessons learned from the manufacturing industry," International journal of innovation management. Vol. 17. No. 1. pp. 1-25, 2013. <https://doi.org/10.1142/S1363919613400045>
- [8] D. J. Tis "Identification of dynamic abilities: nature and microbases of (sustainable) company results," Russian Management Journal, Vol. 7, No 4. pp. 59-108, 2009. (in russ.)
- [9] S. V. Vorobyev "Service business-model – new competitive advantages for production companies," Harvard Business Review–Russia. <https://hbr-russia.ru/innovatsii/tekhnologii/a18573>
- [10] V. M. Semenov and O. E. Vasilieva "On the issue of functioning of systems of service maintenance of industrial products," Bulletin of South Ural State University, Series "Economics and Management", No 9 (268), pp. 153, 2012. (in russ.)
- [11] H. W. Chesbrough Open Innovation: The New Imperative for Creating and Profiting from Technology. Harvard Business Press, 2003.
- [12] H. Chesbrough Open business models. IP-management. Moscow, Generation. 2008.
- [13] H. Chesbrough, W. Van Haverbeke, and J. West Open Innovation: Researching a New Paradigm. Oxford University Press, 2006.
- [14] W. Vanhaverbeke, "Formation and development of the theory of open innovation," Innovations, No 1, pp. 78-84, 2008. (in russ.)
- [15] M. Frenc, R. Lambert "Open and Closed Innovation: A Comparative Analysis of National Practices," Foresight and STI Governance, No. 3 (7), pp. 16-31, 2008. (in russ.)
- [16] A. A. Bykova and M. A. Molodchik, "Open Innovation Practices: Empirical research of firm's innovation activity in Perm region," Journal of Corporate Finance Research, Vol. 3, No. 3 (11), pp. 77-93, 2009. (in russ.)
- [17] Z. N. Varlamova "Trends and priorities of innovative development of enterprises in the Kurgan region in the light of the model of "open innovation","Regional Economics: Theory and Practice," No. 8, pp. 41-50, 2010. (in russ.)
- [18] Z. N. Varlamova "An open innovation model and the absorption capacity of organizations," Vestnik cherepovetskogo gosudarstvennogo universiteta (Bulletin of the Cherepovets State University), Vol. 2, No 3 (41), pp. 47-50, 2012. (in russ.)
- [19] Innovation activities of organizations in the Kurgan region: Statistical Collection. Kurgan: Sverdlovskstat, 2017. (in russ.)
- [20] T. Saebi and N. Foss "Business models for open innovation: Matching heterogeneous open innovation strategies with business model dimensions," European Management Journal, Vol. 33, No 3, pp. 201-213, 2015. <https://doi.org/10.1016/j.emj.2014.11.002>