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OPEN INNOVATION STRATEGY AS A DETERMINANT OF SUSTAINABLE ENTERPRISE COMPETITIVENESS

Abstract

In order for enterprises to be successful in their field, they must have an adequately defined and implemented innovation strategy. In today's business practice, enterprises that do not do this, run the risk of lagging behind their competitors. It is also important to define an effective open innovation strategy that will contribute to a greater competitive advantage of the enterprise. There are no generalized strategies that enterprises can implement, but guidelines that enterprises must follow and adapt to their own characteristics, strengths and weaknesses are given. The aim of this paper is to highlight the importance of accepting the model of open innovation for modern companies in order to achieve sustainable competitiveness of an enterprise.

Keywords: open innovation, open innovation strategy, sustainability, competitiveness

JEL classification: M21, O31, O36

СТРАТЕГИЈА ОТВОРЕНИХ ИНОВАЦИЈА КАО ДЕТЕРМИНАНТА ОДРЖИВЕ КОНКУРЕНТНОСТИ ПРЕДУЗЕЋА

Апстракт

Да би предузеће било успешно у својој грани, мора имати адекватно дефинисану и имплементирану стратегију иновација. У савременој пословној пракси, предузећа која ово не учине ризикују да буду у заостатку у односу на своје конкуренте. Такође је битно дефинисати и ефикасну стратегију отворених иновација која ће допринети већој конкурентској предности предузећа. Ипак, не постоје генерализоване стратегије које предузећа могу имплементирати, већ су дате смернице које предузећа морају пратити и прилагодити сопственим карактеристикама, снагама и слабостима. Циљ рада је да истакне важност прихватања модела отворених иновација како би модерно предузеће стекло одрживу конкурентност на тржишту.

Кључне речи: отворене иновације, стратегија отворених иновација, одрживост, конкурентност

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Introduction

The open innovation model includes a strategic, managerial exchange of information with stakeholders outside the organization, with the aim of incorporating resources and knowledge into the innovation process of the organization. This model is not limited to the private sector and businesses, but can also be accepted by other entities such as universities and non-profit organizations.

The open innovation model is focused on the knowledge that an enterprise can provide from different sources, in order to encourage innovation and thus create added value for consumers. In fact, focusing on the open innovation model, the enterprise does not strive to come up with the best ideas on their own. Instead, it optimally combines ideas from the internal and external environment, to more effectively manage costs and risk and to accelerate the process of technology development. Sources of knowledge typically include suppliers, research centers, universities, customers, competitors and complementary enterprises. Moreover, through approaches such as crowdsourcing, enterprises can collaborate with a wide range of innovators wherever they are - within or outside the boundaries of the enterprise.

Enterprises that embrace this model of innovation must have a proactive approach to intellectual property management, in order to reap the benefits of their own and external knowledge and innovation in a strategic sense. In this way, they use intellectual property rights that are protected, such as in the case of patents, or unprotected, as is the case with trade secrets, to share this knowledge with external partners when collaborating. In addition, they establish knowledge management processes to ensure that sharing expertise with external participants is managed in a strategic way.

Modern enterprises can adopt open innovations for defense reasons, i.e. to manage and optimize risks connected with product development process. They more often cooperate for offensive reasons - to proactively use innovations and knowledge from the environment to improve their offer and to stay ahead of their competitors. Innovative enterprises have always integrated external knowledge into their product development. The difference between the open innovation model and the traditional - "closed" innovation approach is not as clearly underlined as it is sometimes presented. Namely, enterprises often use a hybrid approach.

The importance of the model of open innovation in modern business conditions

Although there is historical data on external innovation markets, before the rise of corporate research and development laboratories during the so-called Interbellum period, large industrial companies successfully applied the model of closed innovation during most of the twentieth century (Lamoreaux & Sokoloff, 1999). The second industrial revolution caused the intensification of capital-intensive companies that organized innovative processes and activities independently. In order to optimize their large and specialized production activities, these companies have started to invest large funds in internal research and development activities that are specific to each company. The

existence of a large technological base within large corporate laboratories for research and development is important not only for reducing production costs but also for the development of new and profitable products (Chandler, 1990). The new products, protected by intellectual property rights, created large profits, which was then used for investment in internal research and development. This cycle of closed innovations contributed to many fundamental technological discoveries during the twentieth century.

In order for enterprises to develop and successfully commercialize new products and services, they can no longer rely solely on their internal research and development (R&D) capacities, but need to find and integrate interesting external ideas into their existing knowledge base.

During the last decade of the 20th century, an increasing focus on the application of open innovation models has far-reaching implications for internal R&D departments in large enterprises. The use of external knowledge implies the development of strong absorption capacity and capabilities, but also enables enterprises to determine how they can develop the necessary technology and make progress (Cohen & Levinthal, 1990). From the 1990s onwards, the implementation of the vertical integration strategy in most large enterprises was no longer effective.

Table 1: Key principles of the models of closed and open innovation

CLOSED INNOVATION	OPEN INNOVATION
"Most smart people in our field already work for us."	"Not all smart people work for us, so we need to find and harness the knowledge and expertise of individuals/institutions outside of our company."
In order to profit from research and development, an enterprise must discover and develop itself.	External research and development can create significant value, while internal implementation of research and development activities is needed to verify some part of that value.
"If we make the innovation ourselves, we will be the first to place it on the market."	"We don't have to start researching first to profit from innovation."
"If we commercialize the idea first, we will win."	"It is better to build a more successful business model than to be the first to enter the market."
If the enterprise creates the the most innovative ideas in the industry, it will win.	If the enterprise makes the best use of internal and external ideas, it will win.
"We should control our intellectual property rights so that our competitors do not profit from our ideas."	"We should profit from someone else's use of our intellectual property, and we should buy someone else's whenever it enhances our business model."

Source: Wang, Vanhaverbeke & Roijakkers (2012)

Chesbrough (2003) identified a some factors that led enterprises to question the main determinants on which closed approach to innovation is based: 1) the supply of highly trained R&D workers has increased dramatically; 2) increasing the quality and availability of external experts; 3) the emergence of risk capital for financing high-tech ventures; 4) the increase of sophisticated customers and suppliers; 5) time for placement of new products and services has been significantly reduced; 6) the knowledge on which it is based new technological development has become more complex. As a consequence

of this development, many large companies have decided to move away from the internal approach to innovation and focus on the application of open innovation models (the opposing principles of closed and open innovation model are presented in Table 1).

The importance of applying the open innovation model is reflected in the following differences in relation to the closed innovation model:

- 1) It allows to discover internal resources for the external environment;
- 2) Licensing or selling products on the market;
- 3) Offering ideas and external knowledge;
- 4) Acquiring inputs for the innovation process through formal and informal relationships;
- 5) Gathering resources and support;
- 6) Achieving the legitimacy of the external environment;
- 7) Nurturing cumulative and incremental innovations;
- 8) Accessing a wide range of ideas and knowledge;
- 9) Discoveries of new radical problem solving;
- 10) Accessing partners' knowledge and resources (Jamett, Alvarado & Maturana Valderrama, 2017).

This model looks at a project/research as an open system that assumes that knowledge is transferred and that the enterprise must find an approach to combine it as a key process in the development of innovation. The basic characteristics of open innovation are reflected in the form of the enterprise's relationship with all stakeholders (including subjects from the external environment), use of external resources (ideas, people, technology, etc.) and intensive external communication (Chesbrough, 2004).

The application of the open innovation model has brought the following innovations and advantages for enterprises: 1. equal importance is given to external knowledge, compared to knowledge from inside the organization; 2. the central role of the business model is in transforming research and development into commercial value; 3. the importance of assessing R&D projects; 4. purposeful output flows of knowledge, ideas and technology; 5. an abundant fundamental body of knowledge; 6. a proactive role of intellectual property management; 7. appearance of innovation intermediaries; 8. emergence of new metrics for evaluating innovative performances (Brunswick & Vanhaverbeke, 2015).

Key benefits of implementing an open innovation strategy - impact on sustainability and competitiveness

In the era of knowledge economy, investments in intangibles and innovations are essential for success and survival of enterprises (Jovanović, Petrović & Janjić, 2021). Innovation strategy is considered to be the key factor for a sustainable competitiveness of the enterprise, which has become the basis for competitiveness at national and global level. It is necessary for an enterprise to identify that innovation activities are necessary for survival in the dynamic business conditions and that effective and efficient innovation process can be achieved in connection with external organizations and experts (Janjić & Rađenović, 2019).

The innovation strategy defines the way in which the management intends to use the innovation capacities of the enterprise to improve performance and achieve the desired competitive position. It has two important roles. First, it defines the areas in which new products will appear, and the second role is to shape the innovation portfolio and how it will be managed (Krstić & Rađenović, 2018).

The implementation of the open innovation strategy implies the adoption of the following forms of external cooperation:

- 1) Purchase of intellectual property - It represents the way in which organizations can formulate new technologies to negotiate and buy them if there is a will to develop them;
- 2) Outsourcing - Outsourcing innovation implies that cooperation units are separated and formally linked by contract;
- 3) Joint ventures - It is a contractual agreement which creates a special legal entity in which the parent companies hold shares under the conditions and provisions specified in the legal document;
- 4) Strategic alliances - An agreement between two or more independent enterprises, by joining or sharing some of their skills or resources, determines the degree of interaction in order to increase their competitive advantage;
- 5) Networking - An indirect organizational form between the market and enterprises that characterizes the plurality of cooperation agreements between different groups or stakeholders (suppliers, customers, competition, the public and private institutions, etc.);
- 6) Involving customers - Processes, actions and interactions in which the development team cooperates with current or potential customers in the program, project or some phases of the development process, in order to find certain information as latent needs, developing customer knowledge and new solutions;
- 7) Sale of intellectual property - Ways in which organizations can formulate new technologies for negotiation, market sales if they are unwilling to develop them;
- 8) Spin-off - An agreement made with the aim of commercializing one or more research results outside the main activity of the parent company (technical and competitive) (Jamett, Alvarado & Maturana, 2017).

The main benefits of open innovation strategy imply a higher success rate in launching new products and services, improved R&D results, cost savings, and therefore, improved overall efficiency. These benefits are the result of the following: 1) Better availability of customer/market needs information - open innovation is a successful way to create user-driven innovation, by incorporation of customers in product development process; 2) Improved enterprise reputation and commitment to customers - open innovations involve the customer directly in the process of product development and joint design, while in some cases customers in turn receive fees or some product-related benefits; 3) Access to new markets - open innovation processes enable enterprises and their collaborative partners to reach new and targeted markets; 4) Open innovation strengthens research and development performance - access to new technological solutions/opportunities; 5) Open innovation encourages efficiency - reduction of costs

of innovation process and faster market placement; 6) It ensures resource sharing opportunity - based on technology platforms, enterprises with external participants can share risk and large investments in infrastructure and research equipment, as opposed to individual investments that are very expensive and risky. Besides that, sharing these technology platforms has a positive impact on building networks and partnerships (Allied Consultants Europe, 2012). All these benefits from the implementation of the innovation strategy, ultimately, lead to sustainable competitiveness of the enterprise.

Open innovation model is not only a strategy that can be applied by modern and successful companies, but is a necessary way to bring innovation to the market. Regardless of the form, the main motives for using the open innovation strategy can be grouped into five categories - the first relating to the commercialization of research and technology activities of academic community, while the other four include business alliances:

- 1) "Spin-off" of the research institute for the commercialization of technology - Enterprises keep close links with the academic institutions of which they are part, collaborating on research projects and engaging qualified people from academic/research sector.
- 2) Sharing qualified resources - The goal of open innovation strategies does not have to be just the creation of new products or services, but the exchanging of qualified resources over a long period of time.
- 3) Joint development of technology - This is the most typical reason for the strategy of open innovation. Enterprises with specific and synergistic technical competencies form technological partnerships not only for the long-term exchange of qualified resources, but also for the development and marketing of innovative products/services.
- 4) Joint development of the business model - Some enterprises join alliances in the downstream phases. Thus, these alliances only secure the customization of product/service solutions. However, they play an important role in the creation of business models that were eventually adopted in order to commercialize the developed concept. It means that, although these alliances were not particularly important for the development of a specific technology, they have a role in identifying the most relevant business application of an already developed technology.
- 5) Involvement of the user community - Information and telecommunication technologies often enable interaction between the manufacturer and the user community (Di Minin et al., 2016).

In order to increase the impact of open innovation strategy on the sustainable competitive advantage of enterprises, the following is required: 1) establishing activities aimed at external processes of open innovation through risky ventures, licensing of intellectual property and involvement of employees not employed in the research and development sector; 2) promoting collaborative actions with customers and external actors; 3) studies and technological analysis - technology prediction; 4) defining an exclusive fund for investment in innovations; 5) establishing a process of formal partnerships for technological development; 6) review of internal processes that allow greater fluidity of implementation of ideas, prototypes and innovation projects in a way

that is not related to the work and routine of the enterprise; 7) radical removal of the myth from the organizational culture that no one can make mistakes (mistakes are allowed if they happen and are quickly revised); 8) ensure that neither top management nor short-term goals interfere with current and future innovation initiatives; 9) seek initiatives through partnerships, spin-off companies, risky ventures and effectively introduce radical innovations in the organization (Paulo, Oliveira & Porto, 2017).

Challenges in application of open innovation model - the aspect of sustainable competitiveness

In modern conditions, enterprises enter into various forms of cooperation in order to gain competitive advantage and growth. Different forms of cooperation in R&D activities enable enterprises to have a better competitive position in a rapidly changing global market. The enterprise's motives for joining the alliance are related to the exchange of knowledge, skills and technology, which ultimately leads to creating greater value for partners, achieving synergies and sustainable competitiveness (Jovanović, 2016).

However, the collaboration forces companies to explore areas they have never explored before and problems they have never faced before. Professional relationship management is the beginning of a cooperation that can begin by hiring a new partner and creating a relationship with the partner's management. This has become a kind of challenge as enterprises have different organizational and cultural elements and characteristics, especially when enterprises start collaborating with subjects from external environment. Therefore, management must constantly motivate people to be creative despite the new circumstances. It requires effective communication about a number of organizations and cultures is necessary, especially in creating solutions to solve inter-organizational problems (Boudreau, 1998).

Previously presented forms of external cooperation (strategic alliances, joint ventures, networking, outsourcing, purchase/sale intellectual property, involving customers, spin-off) of the enterprise indicate certain effects from the aspect of the enterprise competitiveness. Thus, by purchasing intellectual property, a company can, without investing in its own research and development activities, acquire certain technology that can be further improved and reach an innovated product in order to gain a competitive advantage. On the other hand, when it comes to outsourcing, it can lead to a loss of research and long-term development because it is often used as a substitute for innovation. In this way, long-term sustainability of the enterprise is called into question.

When it comes to strategic alliances, it is crucial to choose an adequate innovation strategy (open innovation strategy) in order for the company to gain sustainable competitiveness based on joining strategic alliances. The importance of the innovation strategy for the success of the alliance is reflected in the following: 1) the innovation strategy enables the realization of the strategic goals of the alliance, the creation and delivery of value and the creation of a sustainable competitive advantage; 2) it helps in more precise tracking and understanding market and technological trends and their impact on the position of a strategic alliance; 3) innovation strategy imposes the creation of plans for the development of innovation opportunities and mobilization resources; 4)

innovation processes are developed for the needs of long-term goals; 5) the development of an innovation strategy contributes to strengthening the knowledge of the market and consumers, technology, competition, suppliers, as well as the knowledge of available financial resources (Dodgson, Gann & Salter, 2008).

The challenges that enterprises face in implementing an open innovation strategy can be observed through certain dimensions:

- 1) Networks - An effective open innovation strategy is not only the result of good knowledge among participants, but more importantly, it occurs as a result of mutual trust. In order to strengthen the cluster and eliminate the gap that affects the mutual trust of the participants, it is necessary to hold regular meetings and create opportunities for dialogue.
- 2) Technology - This dimension is related to research and technological development practices, such as technological intelligence and technology resources, common infrastructure and supporting resources for R&D.
- 3) Human capital - Human capital is an extremely important factor for the implementation of an effective open innovation strategy. Many R&D projects record extremely high failure rates because they do not have adequate human resources with the necessary competencies, skills and knowledge.
- 4) Business model - Open business model suggests new challenges and problems for intellectual property management. Enterprises must bypass defensive reactions to begin to view intellectual property as a strategic asset, intensifying interaction with their environment. This dimension highlights issues of intellectual property management, along with risky financing and open business models (Allied Consultants Europe, 2012).

Conclusion

Over the past decade, the open innovation model approach has continued its successful entry not only into large innovative companies, but also into small and medium-sized enterprises and public organizations. The concept behind this logic is as follows - organizations should reap more benefits from the use of external ideas and technology, while selling or licensing their own ideas/technologies for research and development outside of their regular business.

It is considered that organizations will continue to implement the open innovation strategy, because it is necessary in order to gain and maintain a competitive advantage. Being in touch with business environment and external stakeholders is critical to understanding the desires, needs and disadvantages of partners, clients, suppliers and distribution channels.

Most organizations that implement an open innovation strategy today seem to rely more on an internal approach. This may be the case because it is easier to use the purchased one than to place your own expertise. However, this has to be different because of the advantages of commercializing unused ideas, making a benefit above the profits of the organization's traditional operations. The open innovation model has great prospects, as it provides new opportunities to offer clients more innovative and sophisticated products/services. Innovative and flexible culture, open testing,

business models on open basis have no limits as long as they are guided by market needs.

In order to benefit from the open innovation model, it must create added value for customers, but companies must also be able to absorb most of that value. This is a direct result of the important link between enterprises efforts to implement open innovation models and their strategies through the concept of a business model. Considering this, it can be argued that open innovation strategies are helpful and relevant in certain circumstances. In particular, enterprises must apply open innovation models, closed innovation approach, or combined innovation models depending on business conditions in order to achieve different innovation goals and superior performance.

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