

## THE CHARACTERISTICS OF THE OPEN INNOVATION MODEL APPLICATION IN SLOVENIAN FIRMS

**Daša Farčnik**

University of Ljubljana, Faculty of Economics  
Kardeljeva ploščad 17, 1000 Ljubljana, Slovenia  
dasa.farcnik@ef.uni-lj.si

**Tjaša Redek**

University of Ljubljana, Faculty of Economics  
Kardeljeva ploščad 17, 1000 Ljubljana, Slovenia  
tjasa.redek@ef.uni-lj.si

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### Abstract

*This paper analyses the characteristics of the model of open innovation in Slovenia. On the basis of activities that are defined by the model of open innovation (Chesbrough, 2003) 222 companies are divided into three groups : companies that do not apply open innovation activities, companies with limited scope of activities of open innovation and companies engaged in the majority of open innovation activities. Three groups of firms also differ with regard to the organizational structure, attitude of staff and management towards the open innovation activities, expenditures for research and development and success of the introduction of new products, process innovation and success of these products and services on the market. Analysis combines the dominant model of innovation model with the open innovation model. Further on it is encouraging that all three groups do not differ regarding their future plans of introducing the model of open innovation activities.*

**Keywords:** innovation, open innovation model, innovation success

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### 1. INTRODUCTION

The model of open innovation, according to Chesbrough (2006) represents the opposite of the classical understanding of development and innovation in enterprises. The classic definition of innovation assumes that the development of ideas and new products takes place within the company, which then produces and market them. In contradiction to prevailing traditional or »vertical« paradigm of innovation, the model of open innovation builds on the inflow and outflow of both internal and external elements in the creation of ideas and products, and then, when the product is designed,

the marketing also focuses on the internal and external elements (Chesbrough, 2004, 2006). The boundaries of the company in a model of open innovation are not clearly defined, but the model assumes flow of information internally and externally. The porosity of the borders, which is actually intentional, is also one of the key elements of the model, as it allows development on the basis of internal and external information, ideas and knowledge, but also allows the transfer of ideas, information and knowledge externally.

Slovenia, as a small and open economy, in which exports account for over three quarters of GDP is strongly integration into international production chains and adopted the export-oriented

growth model (SORS, 2014). GDP at purchasing power parity in Slovenia currently reaches 82 percent of the average EU28 and is classified as the under-developed state. The economy can still grow through the transfer of knowledge as well as lower factor costs, but to a lesser extent as before. Thus, the innovativeness is crucial for the development of Slovenia. This has been confirmed by the World Economic Forum (2008) that since 2007 ranks Slovenia among the countries that grow through innovation ("innovation-driven") and not among the countries that are growing due to increased efficiency ("efficiency driven"). This of course means that the country must still invest additional resources in development of its own innovative products and services, which will be competitive on the global markets and at the same time it will increase the share of global value added. The openness of the economy and the integration into international production chains allows Slovenian companies either direct or indirect access to many sources of information, new ideas and accumulated knowledge that can facilitate the development of new products, services or enable process innovation. In addition, inclusion in global value chains enables Slovenian companies also to provide their knowledge within their chains and facilitate the development in partners and thus contribute to better or cheaper final products. These knowledge spill-overs are the central point of the model of open innovation, which is therefore seen as an extremely interesting concept for Slovenian companies.

The purpose of this paper is therefore to examine the practice of the open innovation activities and link them to the prevailing model of innovation, in which the importance and organization of research and development department and the investments in research and development is particularly emphasized. The aim of this paper is to identify if the companies that implement more open innovation activities are also those companies that have already developed innovation activities. Based on that, the Slovenian firms will be distributed with regard to the intensity of the open innovation activities.

Based on a questionnaire from 222 Slovenian companies conducted in September 2012, using Ward's analysis of the groups, the companies are

initially divided into three groups based on the (intensity) of the activities of open innovation. Further on the differences in means of other innovation activities and elements of genetic material are compared with Tukey's method (Tukey, 1949). The contribution therefore provides one of the first papers that links open innovation with a dominant model of innovation in enterprises and examines the within group differences in the product and process innovation success.

The paper is structured as follows: after the introduction, there are three chapters. The second chapter provides short description of the open innovation model; the third describes the objectives of the paper, the data used and the methodology. In chapter four the results are represented and the last chapter provides conclusions and discusses some practical recommendations.

## **2. THE OPEN INNOVATION MODEL**

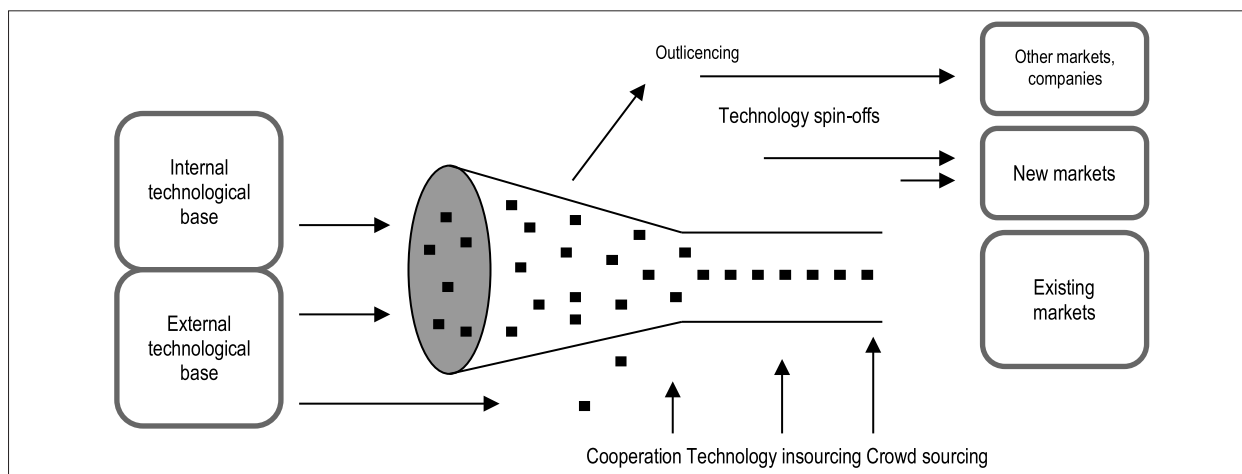
The literature on innovation is very broad and a large number of definitions of, innovation models, as well as models of the impact of innovation on the economy in the broadest sense innovation have been developed. Starting from the current definition of innovation as applied by the Community Innovation Survey, the main international research in the field of innovation, innovations are divided into product or process innovations, whereby both new or significantly improved product (or service) as well as the process (production, support services, distribution, etc..) are an innovation if a product or process represent both novelty to the firm, but not necessarily for the market (Eurostat, 2012). Innovation depends on many factors and over time the focus has shifted from one to the other factor. Based on the innovation literature review Damanpour (1991), for example, found that the authors expose the whole multitude of factors that account to over 10. In theory key determinants of innovation in the company should be then, specialization, centralization, management attitudes toward changes, professionalism, centralisation, functional differentiation, management stability, technological competence (in original technological knowledge), the availability of free resources, company's organization, organiza-

tional structure and internal as well as external communication and information flow. Damanpour has also reviewed the literature that began to focus on the wider importance of other (soft/intangible) factors, such as the internal organization in the broadest sense) and external factors (see eg. The Von Hippel, 1988, which inter alia highlights the importance of the consumer).

ders are purposive and the knowledge flows inward and outward. This two-way flow is the core of the model of open innovation summarized in Figure 1.

The model of open innovation is particularly important for Slovenia, because of the openness of the economy and therefore intensive integration into the world economy. According to the Statistical

Figure 1: The open innovation model



Source: Adopted by Chesbrough, 2006, figure 1.2.

Chesbrough (2003) combined a combination of factors that are both external and internal in a comprehensive model of open innovation. The model emphasizes that the ideas for innovation are created in the company itself but also the business environment can serve as an important source of ideas or as an external technological knowledge base (Figure 1). At the same time the company can influence the innovation activity of other companies, if parts of its knowledge and information are available also externally (eg. intellectual property out-licensing, selling unused or unutilized, free dissemination of knowledge). By definition (Chesbrough, 2003) the model of open innovation builds on both the inflows and outflows of knowledge with a purpose to promote and strengthen innovation activity in the enterprise and the same time the opening of 'market' for outdoor use of new products / services. The company therefore acts as an agent that combines ideas, knowledge and technology. Traditionally, companies preferred to draw inward knowledge and not to provide or "give" it to the outside, but based on the open innovation model the company's bor-

Office (SURS, 2015), exports to the EU (mostly in Germany) represented 79 percent in 2013 and imports from EU represented almost three-quarters of all imports.

Openness of the economy also means that Slovenian companies have access to the latest ideas and knowledge, which is directly relevant to exporters, and firms can also draw ideas and knowledge from importing. This fosters learning, which is one of the key factors in the growth of export-oriented economies (Helpman et al., 2004; Stiglitz and Greenwald, 2014). Companies with open borders can therefore transfer the knowledge through supply chain to the other domestic companies. The question of course is how intensely companies are aware of the opportunities and to what extent the companies draw or share knowledge and information. This area of study in Slovenia is studied to a limited extent. The link between companies and learning has been studied by Prašnikar et al. (2012) and the model of open innovation has been also studied by Rangus and Drnovšek (2013), Rangus (2014) and Pustovrh (2014).

Previous research on the use of open innovation model show that, on average, Slovenian companies are aware of the potential of open innovation model, but are currently focusing primarily on the inflow of information and knowledge (inbound activities) and not on outflow activities (outbound activities). This means that the model is not applied fully, which in particular means that the national economy has not achieved the desired or potential knowledge spill-overs between firms yet (Farčnik, Redek and Trobec, 2014). However, Slovenian companies can be divided into several groups with regard to activities in the field of open innovation (Ranugs, 2014).<sup>1</sup> Prašnikar et al. (2012) further finds that the learning of companies is often the result of external factors, in particular the cooperation with companies in the value chain, suppliers and customers and the absorption of ideas from the competition which therefore implies that these are the inbound activities of the open innovation model. The use of information and knowledge is mainly dependent on firm's genetic material (competences, abilities, strategic orientation, work processes, inventory and human resource management, Nelson and Winter, 1982).

### **3. GOALS AND THE ME**

#### **3.1 Goals**

The contribution builds on previous related research and connects the model of open innovation with the prevailing model of innovation, where research and development (R&D) departments, their organization and strategic position within the company and the resources allocated to R&D are the key factors. Based on the company's intensity of open innovation activities the firms are distributed in groups and between groups differences in R&D activities are investigated. The main research question is, whether the companies that largely implement open innovation activities are the ones that have already developed R&D activities in general (the R&D activities that are included in the prevailing model of innovation). In addition we disentangle the innovation success in success related to the product innovation and

the success related to the process innovation, while most of the research so far has focused only on product innovation. By linking concepts of genetic material (Nelson and Winter, 1982) and innovation, we also shed some light on the importance of the organizational structure of the company, employee relationships, management support and openness of the organization for innovation activity in the company.

#### **3.2 Data**

As part of the international project " Open Innovation Network " and with the cooperation of the Chamber of Commerce and Industry of Slovenia an international survey on the open innovation practices defined by the model of open innovation (Chesbrough, 2003) was sent to the members of the Chamber (owners or managers or heads of development ) in September 2014. The questionnaire included the assessment of the implementation of the open innovation practices, future plans regarding the application of open innovation practices and the organisational characteristics. In addition, questions regarding the mainstream R&D activities were added (Redek et al., 2010; Prašnikar, ed., 2010, Prašnikar et al., 2011). Data was collected for 222 companies, which on average employ of 69 workers.

Model of open innovation includes the following activities: (1) customer and consumer co-creation in R&D projects; (2) crowd sourcing, (3) scanning for external ideas, (4) collaborative innovation with external partners (i.e. suppliers, universities, competitors...), (5) subcontracting R&D, (6) idea & start up competitions, (7) using external networks (e.g. associations, intermediaries, knowledge brokers), (8) participation in standardization (public standards) / influencing industry standards, (9) free revealing (e.g. Ideas, IP) to external parties, (10) IP in-licensing, (11) IP out-licensing, (12) external technologies acquisition, (13) selling unutilized / unused technologies. The intensity of the implementation of certain activities were captured using an 8- point scale (1 -not performed, 2 - very rarely performed and 8 - very intense performed). Respondents plans

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1 Based on the open innovation activities Rangus (2013) classifies companies into four groups, namely open innovators who carry out all the activities of open innovation; systems engineering companies or solution implementers that are using all activities except renting R&D, R&D outsourcers and customer oriented companies.

for changes in the intensity of the implementation of the above activities were described using a five-point scale (2 - significant reduction, 0 – unchanged, 2 - a significant increase).

Other information on companies' innovation activities were collected based on the questionnaire from Redek et al. (2010). The questionnaire covered the performance characteristics of the R&D department (if there is one, what are its functions), information on the amount of R&D expenditure and the importance and perception of the role of R&D spending in terms of strengthening competitive advantages. Respondents also provided information on the success of the introduction of different types of process and product innovation and characteristics (innovativeness) of both types of innovation.

Respondents also provided a lot of information about the company. Based on a 7-point scale (1 - completely disagree, 7 completely agree), we have analysed the organizational structure, employee relations, management support of the R&D activities and openness of the organization. In that manner the education and training of employees on open innovation, employees' perceptions on the introduction of new ideas and technologies, employees' reward system for outstanding innovation, management support for open innovation, openness of the firm's borders, the participation of employees in the search for information and knowledge and in the exchange of knowledge, design of organizational structure in line with the needs of the model of open innovation, and the introduction of interactive tools and methods for participating in open innovation.

### 3.3 Goals and the methodology

The model of open innovation shall encourage innovation activity in enterprises because it allows a faster flow of information and learning, but also has a beneficial effect on other businesses and therefore on the long term also promotes innovation. Regarding the analysis of the implementation of the open innovation activities in Slovenian firms, we formed the following research questions:

- 1) What are the differences in the implementation of each activity of the model of open innovation in Slovenian companies?

- 2) Is there a link between the intensity of each activity of the model of open innovation and innovation activities of the company in general and its performance success?
- 3) Is there a link between the intensity of each activity of the model of open innovation and attitude toward the innovation of the company itself?

In order to answer the research questions, we first distribute firms regarding the intensity of the open innovation activities and second we check for the between groups differences. Based on the thirteen questions on the intensity of the activities defined by the model of open innovation, companies are classified into three groups with Ward's method of cluster analysis. The method is particularly suitable for ordinal responses it forms groups on the basis of  $n$  groups of size 1. On the basis of minimizing the sum of squares and loss of information three groups were selected.

For companies classified in each group the mean values of other variables are calculated. Differences in mean values were calculated on the basis of the Tukey's method of comparison that simultaneously performs pair-wise comparison (Tukey, 1949) and not all the group means at once, such as the classic analysis of variance (ANOVA). Below we present the differences between the average values of the two groups at least at the 5% significance level. If the difference is statistically significant between all the clusters, the significance level is described by the star next to the result. If one cluster statistically significantly differs from the other two, the significance level is assigned only to the result of that cluster.

## 4. RESULTS

### 4.1 Clustering

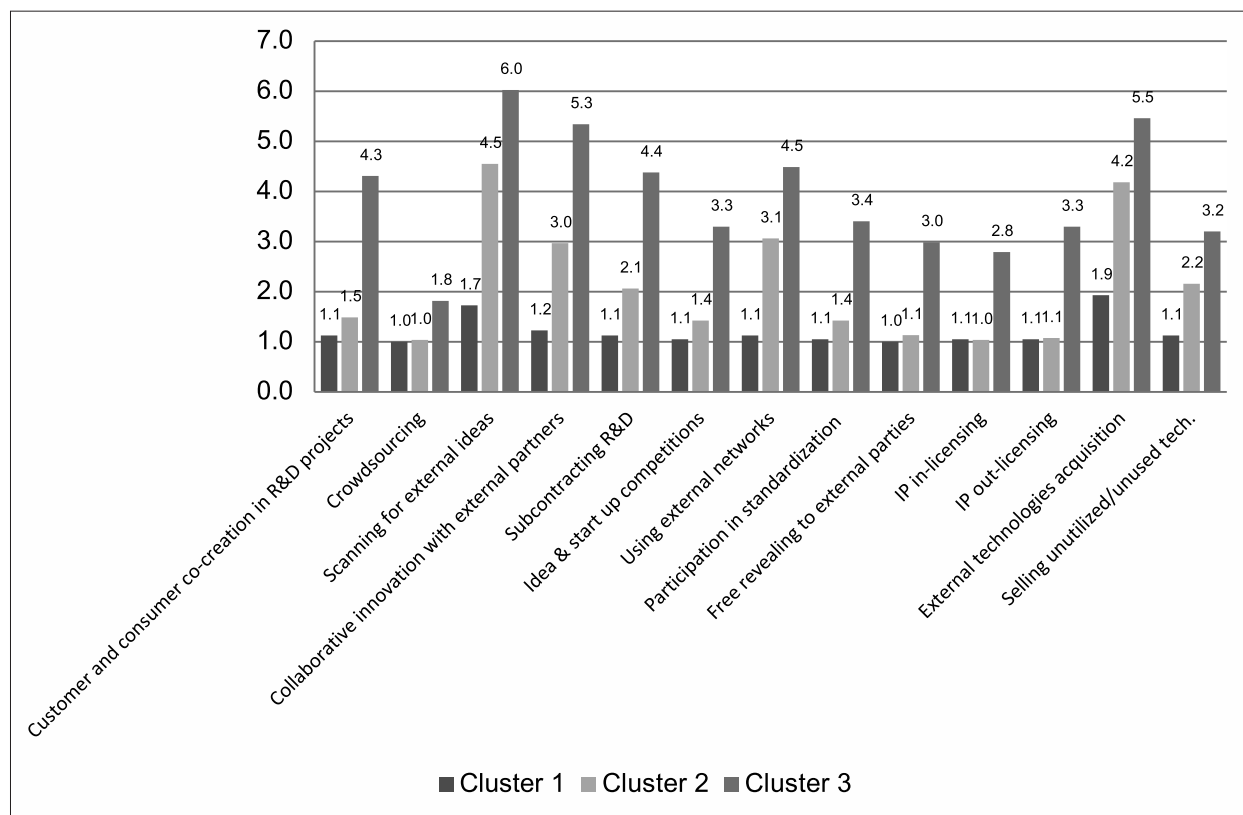
By using Ward's clustering method companies are classified into three groups. The first group are companies that do not or very rarely implement the activities defined in the open innovation model and present 19.4 percent of the sample (40 companies). The second group of 83 companies (40.3 percent of the sample) is characterized by a limited extent



and/or less frequently performance open innovation activities. The third group with also 83 firms consists of companies that to a greater extent than the second group of companies perform all these activities and in accordance to the literature (eg. Chesbrough, 2003 Rangus, 2014) can be described as "open innovators".

a confirmative answer for the particular category or R&D characteristic. Only 3 percent of companies in the first cluster have organized R&D department, the share of those is 20 percent second cluster, and 51 percent in the third cluster. In the third cluster of firms – the firms that are open innovators, the R&D department is statistically significantly more present

Figure 2: Average values of the frequency of using open innovation activities for clusters of firms



Note: IP means intellectual property

Source: Own research, 2014.

Regarding the future plans of the application of open innovation activities, there is no significant difference between groups. This means that, on average, companies that do not currently apply open innovation activities or apply them to a limited extent, they intend to increase the application in the future.

#### 4.2 Open innovation and the R&D

The three clusters vary according to having a R&D department and its role in the company. Table 1 shows the shares of companies that are provided

than in the other two groups (see significance next to the result for the third cluster) and provides systematic support for solving problems arising in the company. In the companies in the third cluster the R&D department also provides an absorption capacity of the collection, storage and dissemination of technological information, it sets guidelines for the technological development of the company, and plays the role of an agent of change. To a lesser extent, unlike companies that do not carry out activities open innovation, the R&D department is important for the formation of independent industrial design capabilities.

*Table 1: R & D characteristics by clusters, as a % of all companies the cluster*

	R&D in the company	Systematic support of the R&D department	R&D dep. builds the abortion capacity	R&D dep. sets the guidelines	Industrial design in R&D dep.
Cluster 1	2.7%	11.8%	2.9%	5.7%	0.0%
Cluster 2	20.3%	29.7%	17.7%	17.2%	12.7%
Cluster 3	50.6% *	54.9% *	47.9% *	43.5% *	24.3% <sup>a</sup>

*Notes: Data show the shares of companies with individual elements. \* Denotes statistically different from the average value at the 5 % significance level. <sup>a</sup> indicates a statistically significant difference in the average value at the 5 % significance level only from the first cluster and not the second.*

*Source: Own research, 2014.*

*Table 2: R&D expenditures for clusters of firms, as a % of all companies the cluster*

	At least 1% of revenues for R&D	More than 3% of revenues for R&D	R&D expenditures not considered entirely as a cost	R&D expenditures are a competitive advantage	Strategic importance of R&D expenditures
Cluster 1	16.7% *	2.8%	15.2% *	15.2% *	6.5% *
Cluster 2	46.2%	18.0%	42.9%	39.4% *	42.2% *
Cluster 3	55.2%	36.8% *	61.1% *	66.7% *	66.2% *

*Notes: The data shows the percentage of firms that answered the questions with "Yes". \* denotes statistically different value from the average value at the 5 % significance level.*

*Source: Own research, 2014.*

Table 2 shows the difference between clusters on R&D expenditures and the role of the expenditures for the future development of the firm.

Open innovators (firms in the third cluster) on average spend a higher proportion of revenues on R&D, but also have different attitudes to these expenditures. Almost two-thirds of these firms do not consider R&D expenditures merely as a cost, but they represent an important facilitator of innovation and represent a source of competitive advantage and thus growth. Consequently, the R&D expenditures have a strategic importance for the company. Regarding the importance or the role of the R&D expenditures we also find different treatments between cluster 1 and 2. Companies in the second companies (ie companies that to a limited extent carry out activities identified by the model of open innovation), on average, more often consider R&D expenditures as a source of competitive advantage and believe they represent a strategic importance for the firm.

#### **4.3 Between cluster difference in the success in product and process innovations**

Companies in the first cluster are significantly less successful in introducing new products in the last five years since only a quarter of these companies have introduced a new product that represented a novelty in the relevant market. The share of successful firms in introducing new projects in the second cluster is in 51%, and 64 % in the third. At the same time, fewer companies (23%) in the first cluster have introduced new products that were new on the relevant market they supply, compared to companies in the second cluster (44%) and in the third group (52%). However, we find no statistically significant differences between companies in the second and third clusters, which means, that the frequency of open innovation activities does not significantly affect the success of the introduction of new products. However, the differences between the moderate innovators open (cluster 2) and open innovators (cluster 3) mainly occur when introduc-

ing new products, which are a novelty on the world market (not only on a local or regional). Thus, 35 percent of all open innovators have introduced a product that is new in the world, while the share of such companies in the second group statistically significantly lower (11%).

In terms of process innovation, companies that have not applied open innovation activities are on average less successful than companies that are moderately or fully introduced the model. Only 13 percent of companies in the first cluster introduced process innovation in the last three years. The share of such firms was more than half (53%) in the second cluster and 71 percent in third cluster. Similarly, the companies in the first cluster, to a lesser extent significantly improved production processes of goods and services, and processes of logistics, delivery or distribution of elements, products and services. We find no statistically significant differences in terms of introducing process innovation between companies in the second and the third cluster.

#### 4.4 Selected organizational characteristics of the clusters

Differences between firms in three clusters according to the selected organizational characteristics are shown in Table 3. On average, companies

vary in providing education and training on open innovation and employee and management support for open innovation. Companies in the first cluster devote fewer resources to education and training on open innovation, as well as management support is smaller than in the second and third cluster. Otherwise, the firms in the first cluster significantly differ from the other two clusters since they developed less positive attitude towards the introduction of new ideas and technologies and the use of knowledge and technology from the outside the borders of their own business. Given that these companies are on average not (yet) applying open innovation activities, employee remuneration in is smaller. As it has already been mentioned, the differences between firms in cluster 2 which to a limited extent carry out activities of open innovation, and open innovators (cluster 3) for the last three mentioned organizational characteristics are not statistically significant.

Open innovators are more likely to encourage the active participation of employees in the search for knowledge, for what they have created interactive tools and methods for participating in the activities of open innovation. At the same time organizational structure is designed in accordance with the needs of the firm. The boundaries of these companies are more open and allow in/out-flow of knowledge. To a

*Table 3: Average values regarding the genetic material, by clusters*

	Education and training on open innovation	Positive attitude towards introduction of new ideas and technologies	Positive attitude towards application of knowledge and technology of other firms	Rewarding employees based on introduction of new ideas	Management support for open innovations
Cluster 1	3.2 *	4.2 *	4.0 *	3.4 *	4.1 *
Cluster 2	4.2 *	5.1	4.8	4.3	5.0 *
Cluster 3	5.1 *	5.5	5.0	4.6	5.6 *
	Open borders of firm	Active participation of employees in knowledge formation	Organisation structure based on the innovation needs	Interactive tools and methods for OI participation	
Cluster 1	4.0 *	3.3 *	3.8 *	3.1 *	
Cluster 2	4.9	4.5 *	4.8 *	3.9 *	
Cluster 3	5.4	5.5 *	5.0 *	4.8 *	

*Notes: The data show the average value on a scale from 1 - completely disagree and 7 - completely agree. \* Denotes statistically different from the mean value of the 5 % confidence level.*

*Source: Own research, 2014.*



lesser extent this applies to firms in the second cluster. Companies that do not implement open innovation activities, have on average more closed borders and of course less -developed tools and methods for participating in open innovation.

## 5. DISCUSSION AND CONCLUSIONS

Using survey data of 222 Slovenian companies and using Ward's clustering method the firms are classified into three clusters as based on the application and frequency of open innovation activities. First cluster represents the companies that (still) do not carry out open innovation activities, the second cluster are companies, which to a limited extent and / or less frequently use these activities, and in the third cluster are "open innovators", that are companies that often use activities identified by the model of open innovation.

In the empirical exercise, we analyzed the relationship between the several dimensions of innovation activities in general and open innovation activities, since based on the theory of innovations, the open innovation activities are related and influence other innovation features. The data shows that companies that carry out activities identified by the model of open innovation, have on average also more likely developed R&D departments and the department has a strategic role in the company. This cluster of companies devotes a larger share of revenues to research and development. This implies that companies, which are otherwise active in the field of innovation, are also more active in the field of open innovation. The information and knowledge in these firms are obtained either within or outside the firm and are a source of competitive advantage. However, the performance comparison between companies in the three groups shows that the differences between the second and third group are small and insignificant, but companies in both groups more successful in product and process innovation

from the companies in the first group. "Open innovators" have also developed an appropriate organizational structure and encourage employee relations and support of the management in order to support and promote the activities in the field of open innovation. Similarly, this also holds for the companies in the second group, particularly with regards to the attitude of employees and their remuneration. This however is not true for companies in the first group.

The paper links the two models of innovation: the dominant model, which is based primarily on the role of the R&D department, and a model of open innovation. The results show a clear link in the development of the R&D department and introduction of the open innovation model. At the same time, we however find that with regard to the success in process and product innovation, all the open innovation activities are not directly necessary. We actually find that based on a sample of Slovenian companies, the open innovation model complements dominant innovation model.

This paper offers several recommendations for managers of Slovenian companies. It is appropriate to complement the existing models of innovation with the open innovation model and opening firms' borders. Companies that are constantly looking for ideas outside the company, cooperate with various stakeholders and allow outbound sharing of their knowledge, are on average more successful in introducing new products that are not only new to the regional but also on the global market. Successful companies also have more developed R&D department, which has a strategic role in the company. This might lead to a conclusion that the application of only the model of open innovation, does not offer gaining or maintaining competitive advantage. For a successful application the open innovation model the firm must adopt an adequate organizational structure, human resource management and management support.

### EXTENDED SUMMARY / IZVLEČEK

Model odprtih inovacij po besedah Chesbrougha (2006) predstavlja nasprotje klasičnemu razumevanju razvoja in inoviranja v podjetjih. Klasična definicija inovacij naj bi namreč predpostavila, da podjetje samo znotraj podjetja oblikuje

ideje in razvija nove proizvode, jih nato proizvede in trži. Model odprtih inovacij v nasprotju s to 'vertikalno' paradigmo, kot pravi Chesbrough (2004, 2006) stremi k temu, da podjetje namerno uporablja tako notranje kot tudi zunanje prvine pri oblikovanju idej in proizvodov in se nato, ko je proizvod oblikovan, pri trženju ravno tako opre na vse razpoložljive prvine, notranje in zunanje. Meje podjetja tako v modelu odprtih inovacij niso jasno začrtane, pač pa model predpostavlja prehajanje informacij navznoter in navzven. Poročnost mej, ki pa je pravzaprav namerna, je ravno tako eden ključnih elementov modela, saj omogoča razvoj na podlagi notranjih in zunanjih informacij, idej, znanja, hkrati pa omogoča tudi prenos idej, informacij in znanja navzven. Slovenija, kot majhno in odprto gospodarstvo, v katerem izvoz predstavlja dobre tri četrtine BDP (SURS, 2014) in je tako močno vpeto v mednarodne proizvodne verige, raste predvsem s pomočjo izvozno-usmerjenega modela rasti. Tako je za slovenski razvoj inovativnost ključnega pomena, saj mora država vedno več vlagati v razvoj lastnih inovativnih proizvodov in storitev, s katerimi bo prodirala na globalne trge končnih proizvodov in si na drugi strani tudi povečevala delež v globalno ustvarjeni dodani vrednosti.

Prispevek nadgrajuje pretekle raziskave in poveže model odprtega inoviranja s prevladujočim modelom inoviranja, kjer se kot ključni dejavnik omenjajo oddelki namenjeni raziskavam in razvoju, njihova organizacija in strateška pozicija znotraj podjetja ter sredstva namenjena raziskavam in razvoju. Vprašanje je namreč, če so podjetja, ki v večji meri izvajajo aktivnosti odprtega inoviranja, tudi tista podjetja, ki že uporabljajo model odprtih inovacij kot prevladujoč model inoviranja.

Z namenom preučitve komplementarnosti obstoječega modela inoviranja in modela odprtih inovacij je bila v septembru 2014 izvedena anketa o razširjenosti uporabe trinajstih aktivnosti, ki so opredeljene v modelu odprtih inovacij (Chesbrough, 2003), o njihovi prihodnji uporabi ter o organizacijskih značilnostih podjetij. Podjetja so podala tudi številne druge informacije o inovacijski dejavnosti v podjetju (vprašalnik iz Redek in ostali, 2010). Vprašalnik je zajel značilnosti delovanja oddelka raziskav (ali obstaja, kaj so njegove naloge), podal informacije o višini izdatkov za raziskave in razvoj ter pomenu in percepciji vloge trošenja za raziskave in razvoj v smislu krepitev konkurenčnih prednosti. Respondenti so orisali tudi uspešnost uvajanja različnih tipov procesnih in proizvodnih inovacij ter značilnosti (naprednost) obeh tipov inovacij.

Na podlagi odgovorov 222 slovenskih podjetij so podjetja z Wardovo analizo skupin najprej razdeljena v tri skupine glede (intenzivnosti) izvajanja aktivnosti odprtega inoviranja. V prvi skupini je 40 podjetij oziroma 19,4 odstotkov vseh opazovanih podjetij, ki ne izvajajo oziroma zelo redko izvajajo dejavnosti opredeljene z modelom odprtih inovacij. V drugi skupini je 83 podjetij oziroma 40,3 odstotkov vseh opazovanih podjetij, ki v omejenem obsegu in manj pogosto izvajajo dejavnosti, opredeljene z modelom odprtih inovacij. V tretji skupini pa je prav tako 83 podjetij, ki izvaja večinoma vse omenjene dejavnosti in bolj intenzivno kot v drugi skupini in jih v skladu s smernicami domače in tuje literature (npr. Chesbrough, 2003, Rangus 2014) lahko imenujemo »odprti inovatorji«. Glede na intenzivnost izvajanja aktivnosti odprtega inoviranja so podjetja v nadaljevanju obravnavana ločeno po skupinah.

V nadaljevanju smo razlike v povprečnih vrednostih ostalih inovacijskih dejavnosti in elementov genetskega materiala primerjali s Tukey-jevo metodo (Tukey, 1949). Podatki kažejo, da imajo podjetja, ki izvajajo aktivnosti opredeljene z modelom odprtih inovacij, v povprečju tudi bolj pogosto razvite oddelke raziskav in razvoja. Ti oddelki imajo hkrati tudi strateško vlogo v podjetju. Ta skupina podjetij nameni tudi večji delež prihodkov raziskavam in razvoju. Tako so podjetja, ki so tudi sicer bolj aktivna na področju inovacij, tudi bolj aktivna na področju odprtega inoviranja, in so informacije pridobljene bodisi znotraj ali zunaj podjetja vir njihovih konkurenčnih prednosti. Primerjava uspešnosti med podjetji v treh skupinah pa kaže, da so razlike med drugo in tretjo skupino majhne in neznailne, so pa podjetja v obeh skupinah bolj uspešna pri produkti in procesni inovativnosti od podjetij v prvi skupini. »Odprti inovatorji« imajo tudi drugačno organizacijsko strukturo in razvijajo odnose zaposlenih in vodstva do inovacij tako, da s tem spodbujajo oziroma podpirajo tudi aktivnosti s področja odprtih inovacij. Poleg tretje skupine to v veliki meri velja tudi za podjetja v drugi skupini, predvsem kar se tiče odnosa zaposlenih in njihovega nagrajevanja. To pa ne drži za podjetja v prvi skupini.

Tako prispevek ponuja eno prvih raziskav povezave odprtega inoviranja s prevladujočim modelom inovacijske dejavnosti v podjetjih in preučuje razlike v uspešnosti skupin glede produktnih kot tudi procesnih inovacij. Rezultati kažejo jasno povezavo razvitosti oddelka raziskav in razvoja na uvajanje modela odprtega inoviranja. Hkrati pa kažejo, da sicer za uspešnost podjetij pri produkti in procesni inovacijah, niso potrebne vse dejavnosti odprtega inoviranja. Oba modela se na vzorcu slovenskih podjetij celo komplementarno dopolnjujeta.

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