

## ANALYSIS OF SPECIFIC OPEN INNOVATION COMPONENTS BASED ON PERCEPTION AMONG SLOVAK COMPANIES

<sup>1</sup>LUCIA KOHNOVÁ

*Comenius University in Bratislava, Faculty of management  
Odbojárov 10, 820 05 Bratislava, Slovak Republic  
email: "lucia.kohnova@fm.uniba.sk"*

**Abstract:** In modern era businesses are in a highly competitive environment where the goal is not to acquire their competitiveness through activities such as reducing costs, but through constant innovation. There exist no excellent businesses, there are only those that are able to survive and it is with the ability to reflect on the changing environment using innovation activities. This topic mainly concerns SMEs, while they have less resources to achieve high innovation performance than large companies. This research paper is specifically focused on companies in Slovakia, comparing innovation performance and its perception among micro, SMEs and large companies. The aim of the research is to analyze, compare and evaluate perception of specific components of open innovation model among Slovak companies.

**Keywords:** innovation, open innovation, external relations, SMEs

### 1 Introduction

In the current economy based on knowledge not only tangible and financial assets enter the management, but also those which are of a qualitative nature and often difficult to measure. Companies are very dependent on these intangible assets, given that they support the growth of companies and their competitiveness (Kaplan, Norton, 2004). These intangible assets can be classified under one term which is knowledge management. Knowledge management can be generally understood as "an effort to make know-how available in an organization to "those who need it, to where it is needed, at the right time and in a form in which it is needed in order to increase human and organization performance" (Papula et al, 2013). At the same time, however, the flow of knowledge is not limited throughout the organization from top management to the lowest level, but in all directions. Whether the acquisition of knowledge from the employees themselves, or even from outside the organization. Many authors thus agree that it is the proper knowledge management that is becoming increasingly important in maintaining a competitive advantage and thus enters into the process of innovation management and increasing innovation potential (Will, 2008).

#### 1.1 Open innovation model and the differences based on size of organization

As it is important to properly manage knowledge in organizations, innovation activity also significantly contributes to its success. Capacity of organizations to continually generate innovation is regarded as one of the main factors affecting the performance of the organization, its stability and ability to form and maintain a competitive advantage (Lengnick-Hall, 1992; Porter, 1990). Research authors dealing with this subject directly indicate that the ability to generate ideas is leading to the dominant competitive position (Banbury & Mitchell, 1995; Bates & Flynn, 1995). Innovations are indeed relatively established notion among businesses, especially in terms of product and process innovation (Tidd & Bessant, 2005), but there are still gaps in the ability of effective management of innovation process. To produce the required quantity and quality of innovation activities, company must first obtain high quality ideas and to be able to manage the resources of these ideas.

Historically, companies use a model that was based on in-house management and sharing of knowledge, which led to the creation, collection and evaluation of ideas and then to innovation. For innovation, organizations used their own resources, whether human, financial or material. Closed innovation model as it is called today (Chesbrough, 2003) is still a very used approach to innovation. In reality, however, it relates more to small and medium-sized organizations, which are not operating globally and thus have less linkages to external entities.

The use of internal resources for the development and promotion of innovation is still of high importance. However, the ultra-competitive environment, which is characterized by rapid change, however, is forcing businesses to innovate more and more often. They face insufficient internal capacity, and often lack new ideas for innovation. Open innovation model (Chesbrough, 2003; Gassmann, 2004 & van de Vrande et al., 2009) therefore focuses not only on internal resources for innovation, but also external. However the flow of knowledge that lead to innovation can go inwards and also outwards from the organization (Huang & Rice, 2009). The following figure number 1 shows a comparison of closed innovation and open innovation model.

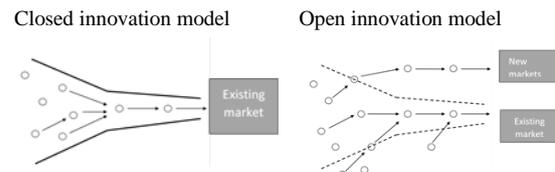


Figure 1: Comparison of closed and open innovation model<sup>1</sup>

Many businesses now recognize the importance of the involvement of external actors in their innovation activities precisely because what Chesbrough said, that "not all wise people work for us" (Chesbrough, 2003). However, this model is not new. In particular, large companies that maintain relations with its external partners regularly use these external resources as an incubator for ideas. In practice, however, today the need for open innovation develops into a new level, not only as gaining knowledge but also trading or lending of intellectual capital (Grönlund, Sjödin, & Frishammar 2010, p.108).

Large companies are often at an advantage in terms of innovation activities, not only in terms of the existing relations but also wider resources, and people that help the creation of ideas (Habaradas 2009; Bianchi et al., 2010). However small and medium-sized organizations due to lack of financial and human resources are more and more dependent on building relationships with external partners to achieve higher innovation activity. The following figure 2 shows the involvement of different sources for innovation. Except human resources-employees, all other entities can be summarized under the category of external sources of innovation.



Figure 2: Sources for ideas in innovation process<sup>2</sup>

Thus both internal and external resources enter the creation of ideas for innovation. Practice has confirmed that the external resources (open innovation model) is not an independent approach to innovation, but complementary to the internal knowledge of the company and therefore together lead to innovative activities (Roper et al. 2008).

<sup>1</sup> Chesbrough, H. Open Innovation: The new imperative for creating and profiting from technology. Harvard Business School Press 2003, Boston, Massachusetts

<sup>2</sup> Atkearney [cit. 2014-10-01]. Available at: <http://www.atkearney.com/documents/10192/760607/FG-Turbocharging-Open-Innovation-in-a-100-Day-Blitz-1.png/2b91d5f3-783e-4e0b-b6e4-c32c22e3be02?t=1361819739610>

## 1.2 Innovation and sharing knowledge within Slovak companies

Several studies confirm that the innovation performance of small and medium-sized organizations in open model is inferior to the innovation performance of large companies. In contrast, 20% - 60% of large companies are involved in open innovation activities within the OECD countries, but only 5% -20% of SMEs involve in such activities. If we take into account Slovakia compared to other EU28 countries, Slovak SMEs are ranked 21 from EU28 countries and placed third among the V4 countries (Innovation Union Scoreboard, 2014).

By Lee et al. it is precisely the involvement of SMEs in networks with external entities that is essential for collecting ideas for innovation (Lee et al., 2010). However, the fact that the approach to open innovation in Slovakia is not among SMEs is sufficient extend is also due to the mistrust of sharing with external entities. Small and medium sized organizations consider sharing knowledge as a threat because they see it as an important transfer of knowledge and know-how to other entities rather than the possibility of jointly developing competitiveness (Papula, Volna, CAD, 2013). It is clear that continuous innovation activity and proper allocation of resources for innovation are keys to building competitiveness. The right activities related to the management of intellectual capital – hence in our case the management of relations with external entities and innovation directly affect the financial performance of organizations, according to research on a sample of Slovak organizations (Pilková et al., 2012).

## 2 Methodology

### Research goal

The aim of the research is to find and analyze linkages between innovation and relations with external subjects. Followed by further comparison of results among micro and small-sized companies, medium-sized companies and large companies.

### Sample and data collection

The sample for this research consisted of 69 Slovak companies with size from micro to large company. The main presence had medium-sized companies with the number 30, followed by 17 small-sized companies and 16 large-sized companies. Micro-sized companies had lowest share from the sample group. Companies were divided based on the number of their employees, where:

- Large-sized company – 250 and more employees
- Medium-sized company – 50 to 249 employees
- Small-sized company- 10 to 49 employees
- Micro-sized company- 0 to 9 employees

Figure 3 shows the distribution of interviewed companies by their size.

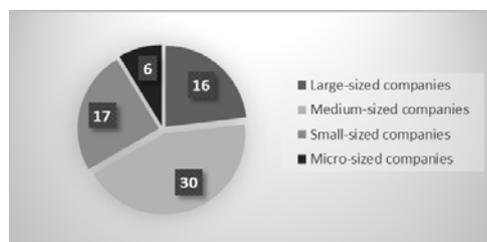


Figure 3: Division of companies researched, based on number of their employees.

Data in this research were collected from questionnaires in 2014, where interviewees were executives, top management or from controlling division. Interviewees in this research were asked to answer questions divided into topics focused on companies' objectives and their importance, their activities within these objectives, and their long term significance.

For the purpose of this paper, two specific dimensions were analyzed within these 3 questions:

1. "In your company, in terms of achieving the objectives of the company, what significance do you attribute to:"
  - Innovation – changes/improvements of products, processes
  - Relations with external subjects
2. "Please, give your opinion on the following statements":
  - In our company there is a mechanism to capture ideas and recommendations for improvement or innovation, (which come from the employees). Relations with external subjects
  - In our company, we are aware of the need for strong relationships and partnerships (with universities, professional associations, business partners) and we provide activities to build them.
3. "Which of the following areas do you consider essential for long-term financial performance management company (long-term sustainability=the ability to meet the objectives as profit, ROA, ...)"
  - Investing in research, development and innovation processes
  - Building and developing long-lasting relationships and strategic partnerships with business partners

To quantify these qualitative indicators, interviewees were asked to answer within a scale of 1 to 4, where the meaning was:

- 1 - No importance; does not apply; insignificant
- 2 - Small importance; sometimes applies; no very significant
- 3 - Medium importance; usually applies; significant
- 4 - High importance; always applies; very significant

Resarch data were collected with collaboration with doc. Ing. Ján Papula, Phd. & Mgr. Jana Volná, PhD.

## 2.1 Results

The aim of this paper is to find and analyze linkages between innovation and relations with external subjects. We focus on this topic from two dimensions. Both researched topics about innovation and relations with external partners are divided into three questions based on importance, activities and significance. Secondly we compare obtained results among three groups of companies based on their size. For the purpose of this research the sample of 69 questioned companies was divided into 16 large companies, 30 medium companies and 23 small and micro companies, which were analyzed separately.

Analysis in this paper provide an overview of current situation among Slovak companies based on their view and linkages in the area of open innovation.

To understand and explain the importance of innovation in the context of objectives, activities and long term significance, we look at evaluations of three groups of companies – micro and small, medium and large. Figure number 4 shows the percentage shares of each type of answer, from the most positive 4 (meaning significant, important) to least positive 1 (insignificant, least important).

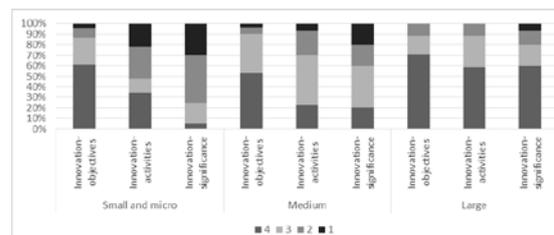


Figure 4: Analysis of innovation in context of objectives, activities and long term significance

In comparison of each type of businesses in the dimension of innovation, high evaluation achieved question regarding innovation objectives in each type of business. However figure number 4 clearly shows that activities regarding innovation and

the significance for long term sustainability are highly evaluated only by large companies. Around 60% answered with the most positive answer (number 4) for both questions. Moreover these two questions were evaluated very poorly by small and micro companies, where 22% of these companies do not do any activities towards innovation, and 26% do not consider innovation significant for their long term sustainability.

To find the linkages in the context of open innovation, we further analyze the area of relations with external partners. For the purpose of this paper we divided external subjects as resources into customers and other external subjects. This is because most companies have relations with customers in some kind of form, and to analyze the relations with other external partners, the data could be spoiled by grouping these two kinds of relations.

Figure number 5 shows the percentage by answers (1 to 4) for the area of relations with external partners. Clearly more companies from each group answered positively to each objectives, activities and significance. Positive result is that most companies realize the significance of partnerships for long term sustainability.

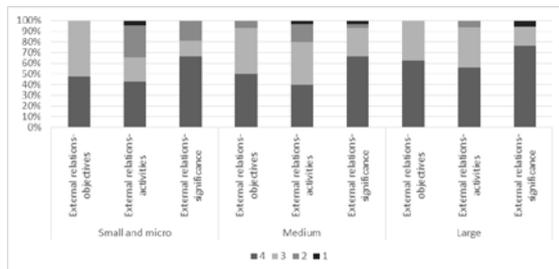


Figure 5: Analysis of external relation in context of objectives, activities and long term significance

If we use an assumption, that large companies have higher innovation performance than smaller companies, which is the basis for European commission research on innovation (2014), we can use a comparison for Slovak companies in our research.

Figure number 6 shows the average answer for each group of companies in the innovation area. With the benchmark we can see that the main differences are in the question of activities and significance, where both micro and small and medium companies rank even below average.

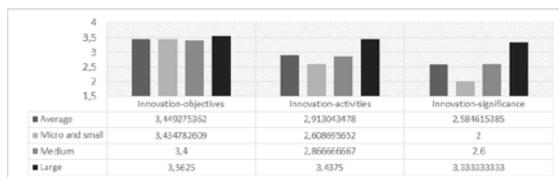


Figure 6: Comparison of average answers in innovation topic Thus high perception of importance of innovation does not automatically influence companies activities, neither their perception of innovation in the context of long term sustainability.

Overall rating in the area of relations with external subjects was higher than in the area of innovation. However results shown in figure number 7 indicate, that lowest rating achieved question about activities within relations with external partners. Again, we can see that seeing importance of one factor does not automatically influence activities with the same strength.

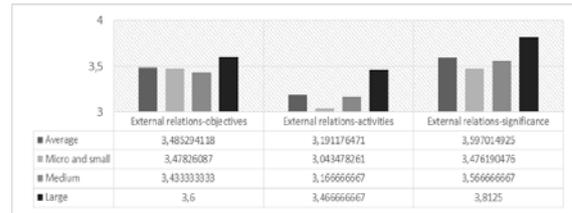


Figure 7: Comparison of average answers in external relations topic

In order to fully understand linkages within objectives, activities and significance for each topic we need to find relations among them. Next figure number X shows correlation in three important dimensions – linking objectives and activities in innovation, followed by external relations, and innovation objectives with external relations objectives.

We used Pearson’s correlation to find possible relationship between these pairs of variables. Existing positive relationship, can be found only for large companies in each pair of variables. These relations are statistically significant (at the 95% confidence level with probability  $p < 0.05$ ), meaning there exist strong relations and the awareness of linkages within these variables only for large companies.

	External relations-objectives		
	Micro and small	Medium	Large
External relations-activity	0,138757849	-0,01101	<b>0,616316</b>
Innovation-objectives	0,022936745	0,057215	<b>0,497067</b>
Innovation-activity	Innovation-objectives		
	Micro and small	Medium	Large
	-0,198688023	-0,10046	<b>0,59604</b>

Table 1: Comparison of Pearson’s correlation within innovation and external relations topics

Correlation of 0,497 for relation of innovation objectives and external relation objectives shown for large companies indicates that there clearly exist a link which confirms the theory of open innovation, if we assume that large companies really achieve better results in open innovation performance.

### 3 Discussion and conclusion

With current environment pushing organizations to innovate more frequently, the need to find sources for innovation becomes evident. The model of closed innovation, where one derives only from internal sources is not appropriate for this type of economy. Therefore the idea of open innovation overcomes the shortcomings by engaging external sources to the process of innovation. While large companies have been using this model for a while, it is essential for SMEs to widen their innovation sources. When looking on the environment of Slovak companies, researches show that Slovak SMEs rank below average, moreover at the tail of EU28 (European commission statement 2014). To investigate the problem of low innovation performance of Slovak companies (especially SMEs) we have analyzed their perception of open innovation components, focusing on innovation objectives, activities and long term significance with external relations objectives, activities and long term significance.

While companies exist in clearly dynamic environment based on knowledge economy, only large Slovak companies perceive innovation as strategically very significant for long term sustainability along with their activities. In contrary micro, small and medium-sized companies do not engage in innovation oriented activities very much. The high difference in the evaluation of innovation objectives versus its activities and significance, for companies except large-sized, can be explained as they know the concept of innovation, but do not fully understand it. Thus they consider innovation important but do not go further. Another explanation may be, that these firms do not know how to engage in innovation activities, do not have the

resources or relationships needed. The area of external relations seems more consistent in answers. Although large companies rank higher with the importance perception in each question than smaller companies. Looking at the average answer within the question of activities regarding external partners, we can see that the smaller the company is the less it engages in these activities. This is easy understandable, while large companies cooperate more with their partners, having strong long term relations. The possibility for small and medium-sized companies to engage in these activities more is through networks. Mostly knowledge networks whether with public entities such as universities or partners, competitors and other businesses. These networks may create appropriate environment to create and share ideas for innovation.

Most importantly this research examines the relations in these areas of innovation and external relations. With the assumption that large companies have better innovation performance, thus better understanding of the concept, they can be used as a benchmark for smaller companies. Examining the linkages, we found strong statistical relations between innovation objective importance and innovation activities for large companies along with strong relation between external relations objectives and activities. It indicates, that large organizations really understand the concept of innovations, because when they see the importance of innovation they also engage in innovation activities. Similarly with external partners. More interesting finding though is the significant correlation between innovation objectives and external relation activities. Large organizations thus use the concept of open innovation. The lack of correlations-relations for smaller companies indicate, that they do not deliberately use open innovation model, nor they seem to understand the linkages in order to be innovative.

When questioning the perception of the concept of open innovation there still can exist a fear of sharing among SMEs which is a great barrier to successfully engage in innovation activities as described by Papula (Papula et al., 2013). As the theory suggest, it is however essential for especially SMEs to engage in innovation activities that incorporate also external environment. Although first of all there is a need for SMEs to realize the importance of open innovation and linkages that lead to better innovation performance.

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#### Primary Paper Section: A

#### Secondary Paper Section: AE, AH