OPEN INNOVATION MODELS AS THE SOURCE OF INNOVATION AND SUSTAINABLE GROWTH OF THE SMEs

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Abstract

This conceptual paper introduces the concept of Open Innovation Model (OIM) which is based on the innovative network centered approach. Open Innovation Model is the crucial source for innovation which nowadays is considered as the main parameter for growth and development. The purpose of the creation of OIM is to provide the SMEs and their region where they operate with the concept that foster the entrepreneurship and also the sustainable development of the region. OIM is based on the continuous collaboration between business subjects and the external environment authorities. As the knowledge becomes an increasingly important part of innovation, this paper suggest an innovative network centered approach between academia – business – government – society that can help to acquire and share the new knowledge and experience that will bring fruitful benefits to all actors.

Key words: open innovation, business model, network centred approach, quadruple helix
JEL Kód: M21, O15

Introduction

In the emerging market economies (countries in transition) of the CEE region, the sustained economic growth based on the use of innovation has come forward as the major objective of government policy. The development of enterprises, which base their competitive strength on the creation and application of the innovation outputs, is a pillar of knowledge-based economy. Such enterprises often spun off from research institutions and closely linked to academia, as the source to generate the innovative outcomes which materialized into commercial applications.

One of the main issues to start with concept of open innovation is to defying the term of innovation. Innovation has been conceptualized in a variety of ways in the literature (Damanpour and Gopalakrshnan, 1998; Damanpour et al., 1989; Wolfe, 1994). According to these authors, innovation is the adoption of an idea or behavior, which could be a system,

policy, program, device, process, product or service that is new to the adopting organization. The innovation is critical for the economic efficiency of both companies and nations and often serves to deal with the turbulence of the external environment.

Definitions of innovation may vary in their wording, but they all stress the need to complete the development and exploitation aspects of new knowledge. The fundamental view sees the innovation as a process of turning opportunity into new ideas and of putting these into widely used practice.

In general, innovation is driven by the ability to see connections, to spot opportunities and to take advantage of them. Innovation matters, not only at the level of the individual enterprise but also increasingly as the well-spring for national economic growth. Innovation and competitive success are not simply about high – technology companies. It becomes a central issue for all players, private, public, local and also regional, and even international. With the rise of the ICT and mainly Internet, the innovation has grown enormously in every part of our life. There is also a high level of complexity which leads to the necessity of interactivity among all innovation actors. The concept of innovation isn't new – organizations have always had to think about changing what they offer the world and the ways they create and deliver that offering if they are to survive and grow (Tidd and Bessant, 2009). The changes are along the core environmental dimensions what explain that innovation can come from external opportunities, not only as the result of internal creativity. This brought the attantion of academics and practcicioners to identify the term of the open innovation.

The open innovation and innovation models has been studied by Chesbrough (2003, 2014) and identified as the unique external source of growth and sustainability for most of the SMEs.

Our new conceptual framework is based on the Network Centred Approach and the various models which manage innovations. We expand the concept of the Quadruple Helix and by integrating the Business Model and the concept of Open Innovation we highlight the importance of governance and linkages between different stakeholders. This will play profound role in enhancing an innovation for the SMEs in the specific region. The new Open Innovation Model (OIM) explains the complexities of innovation and knowledge combination that fosters the innovation, growth and regional development.

1 The Concept of Open Innovation

The idea of open innovation assumes that corporate innovation activities are more like an open system than the traditional (20th century) vertically integrated model. Open innovation offers new terminology and new managerial paradigm. The current state of knowledge on open innovation model are more related to technical invention, technology transfer in R&D labs and still has many gaps on OIM management, on new value creation and revenue models (Teece,1986; Magretta, 2002; Chesbrough et all. 2014). Another concept provided by Osterwalder and Pigneur (2009) consists of three aspects: value creation, business functions as the learning systems and value capture.

There is a lack of agreement in the literature what makes an organization innovative and what is the impact of managerial best practices e.g. leadership, organizational structures and managing the diversity for the strategic and smart growth of SMEs.

In light of the recent global shift from closed innovation models to open and open-source innovation models and from traditional organizational models to community – oriented organizational models, Open Innovation ("OI") is placed at the forefront of the every new concept nowadays**.**

The need of open innovation has been generated by current technology development and the development of business environment in order to tackle quick changes.

The main current theory sources provide a better understanding of open innovation and innovation models which have been studied by Chesbrough (2003, 2006). In some respects, the open innovation can be seen as a call to a return to the late 19th and early 20th century model of innovation, which a rich, diverse market for technology and small, external oriented R&D labs (Mowery, 2009).

Open innovation offers new terminology and new managerial paradigm. According to Chesbrough (2006) there are at least three antecedents in innovation research that helped play a key role in both enabling the ideas of open innovation and also its acceptance among managers and scholars. Firstly, innovation scholars have understood since 1970s that sources of innovative ideas often come from outside the firm. Allen (1977) describes the R&D labs itself as an "open systems" relying on its external environment to generate ideas.

Secondly, open innovation builds on the profiting from innovation framework developed by Teece (1986) paying specific attention to challenges that firms face capturing returns from their innovative effort.

The third antecedent was an emerging interest in the role of business models, as the firms during the 1990s leveraged the Internet to develop new value chains and revenue models.

One of the first definitions of open innovation provided by Chesbrough (2003) characterized the that open innovation means that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well.

One of the first large-scale empirical studies operationalized the concept of OI as it uses a wide range of external actors and sources to help them achieve and sustain innovation (Laursen and Salter, 2006).

The most recently, in response to increasing interest in non-pecuniary knowledge flows (Dahlander and Gann, 2010; Chesbrough and DiMinin, 2014) the definition was extended as follows: "Open innovation is defined as a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanism in lien with the organization's business model (Chesbrough and Bogers, 2014).

The current state of knowledge on open innovation is more related to technical invention, technology transfer in R&D labs and still has many gaps on the management of OI, on new value creation and revenue models (Teece, 1986; Magretta, 2002; Chesbrough et all. 2014).

2.1 New open innovation concepts

According to the latest edition of the Oslo manual (OECD, 2005), a basic reference for the measurement of scientific and technological activities including guidlines for innovation, it is seemed „mission imposible" due to the complexity of the innovation process and the variations in the way it occurs. On a societal level, the growth of innovations is dependent on institutional factors such as transparency, stable rules, and policies including intellectual property rights, simple procedures governing the registration and operation of enterprises, as well as ethical behaviour. These factors influence the external climate in which the innovation-based organization operates, and thus determine the demand for innovation. In recent years, a number of concepts have been proposed for modelling the transformation processes in university - industry – government relations.

Business Model Innovation (BMI)

New communications and computing technology, and the establishment of reasonably open global trading regimes, mean that customers have more choices, variegated customer needs can find expression, and supply alternatives are more transparent. On the other hand technology itself has no single value. The economic value of technology remains latent until it is commercialized in some way via business model (Chesbrough, 2010).

Businesses need to be more customer – centric, especially since technology has evolved to allow the lower costs provision of information and customer solutions. This new environement has also amplified the need to consider not only how to address customer needs more astutely, but also how to capture value from providing new products and service. A business model articulates the logic and provides data and other evidence that demonstrates how a busienss creates and delivers value to customers. It also outlines the architecture of revenues, costs, and profits associated with the business enterprise delivering that value. A business model describes how a company communicates, creates, delivers and captures value out of a value proposition. Furthemore, the succesfull exploitation of new technology requires an attention to developing a succesful match between technological possibilties and market opportunities. New technology without a succesful business model is an opportunity foregone and therefore it is critical that organizations upgrade their ability to identify, assimilate and utilize new business models. The question is: why the enterprises are unable to make any progress in this area, as there is a lack of clera process models, definitions and guidiance about how to be a succesful business model innovator. Amit and Zott (2001) identify novelty, lock – in complementarities and efficiency as key aspects of business model innovation. They have also pointed out the conflict between the business model established for the existing technology, and that required to exploit the emerging, disruptive technology. Moreover, novel business opportunities in relation to tackling societal challenges are often not tackled due to lack of technological innovation, but due to non-technocal issues related to organizational and business model design and innovation, e.g. realted to the complexity to organize and generate revenues in multi-stakeholders and open-innovation eco-system. According to Relich (2016) the successful new product development and launch is a key factor to continue business survival and growth.

Regional Innovation Systems

The pricipal sign of the trend towards regionalisation is the apparent growth in importnace of regional clusters and innovation systems over the last decades. The question arises to what strategis local communicties can initiate in order to raise the innovativeness and competitivenss of regional firms.

From the Regional Innovation Systems perspective, innovation policy instruments must be adapted to distinctive characteristics in individual regions, building on analyses of regional innovation system barriers (e.g. factors which inhibit the rgional industrial milieu, its institutional set-up, barriers related to attitude towards innovation and entrepreneurship, etc) (Isaksen, 2001). According to this perspective the innovation performance in specific region depends to a large extent, on how firms utilise the experience and knowledge of other firms, reseach organizations, government sector agencies etc. In innovation process, and how ther blend this with the firm's inetrnal capabilities. Innovation performance depends partially upon the capbility of individual organizations and also to a considerable degree, by the conditions in the firms'environment and specific contextual factros that may inlunece innovation processes (Isaksen, 2001).

Regional clustering is seen as a first prerequisties for the mergence of a regional innovation system. Regions have to seek compatitive advantage from mobilising all their assets including institutional and govenrmental ones where these exist, or demand them where they do not (Cook, Boekholt and Todtling, 2000). In order to constitute an innovation system organisations in the cluster have to form the regional innovative networks which involve more organised and formal coopertaion between organizations in innovative projects. Therefore, complete regional innovation systems involve customer cooperation with new products, cooperation in innovation activity between enterprises and knowledge creating and diffusing organizations, such as univeristies, colleages, traing firms, R&D institutes, technology transfer agencies, business associations, finacial institutions etc. These organizations provide important know-how, train labor, funding that all suport regional innovation (Isaksen, 2001; Cooke et al. 2000).

Quadruple Helix Model

The development of an innovation is highly dependent on the ability to network between the different actors in society and the avoidance of barriers. These links are provided by public, private, or public-private organizations that can foster the innovation potential not only on a national level but also at regional level. For example, national systems of innovation

(Lundvall 1992; Nelson 1993) have been compared with regional systems (Gubrandsen 1997; DeCastro et al.1998). These linkages are often described in the form of a helix. Sometimes they are described in the form of a triple helix represented by companies, universities and R&D institutions, and governmental authorities.`The Triple Helix Innovation process, on the other hand, is characterized by academia (A), government (G), and industry (I) playing fully integrated and overlapping roles (National Institute for Triple Helix Innovation). The triple helix is about creative links between three above mentioned actors, the state, the private sector and universities. The model focuses on innovative firms and the sustenance and support they may derive from state authorities and in particular, from universities and research institutions (Leydesdorff and Etzkowitz, 1998). The concept is theoretically grounded in evolutionary economics which sees the economy as a compex adaptive system and comapnies as organisms adapting to their surroundigs. Triple helix innovation is a process by which academia, governemnt, and industry collaborate in order to create or discover new knoledge, technology, or products and services that arwe transmitted to intended final users in fulfilment of a social need.

The fostering of a "triple helix" model of collaboration (Etzkowitz and Leydesdorff, 1999) must be initiated and undertaken by all actors – universities, governments (national and regional) and external partners (industry small and large, intermediate agencies bodies, public authorities, etc.).

Some criticims of the Triple Helix model had been occured stating that this helix is not a sufficient concidition for long-term innovative growth, and that a fourt helix, i.e. civil society, needs to be incormporated and takes part in the process of knowledge creation (Liljemark, 2004).

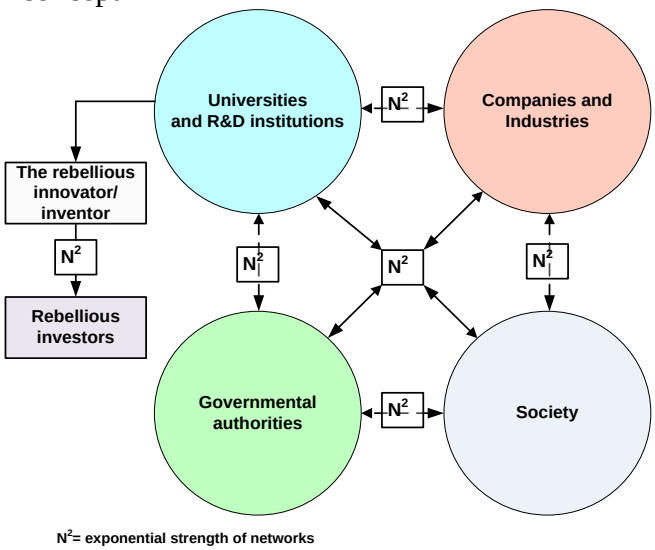
Companies today have become more aware of the need of collaboration in contexts where companies cannot act just by themeselves. Particulalry, the inovlevement of consumers in the product and service dvevelopemnt process is added to the triple helix model to add a fourth actor to build a frameowrk where universities, govenrement, companies and consumers join forces. Some authors consider the interaction between business, academia, governement and civil society as a requirement for the sustainable growth (Khan & Al-Ansar, 2005. In: MacGregor et al. 2010). Based on the OECD studies the SMEs have week innovation capacity and activities mainly in the CEE region. One of the reasons is the lack of the innovation potential and resources (Kormancova, 2015).

Delman and Toft (2007) speak about 4th pillar organizations which are typically structured as independent, non-profit entities, and leverage private and public investment to implemnt shared – cost R&D programs and supply technical products and services. In order to provide all thi, they:

- Create networks of industry and university leaders
- Build partnerships and collaborations to undertake R&D
- Create a national, cross – sectroal vision for R&D excellence
- Develop, attract and retain highly qualified people

This kind of organizations are considered to be important players in the innovation systems as they work in the border areas and create links between all stakeholders in the specific region.

Fig. 1 Quadruple helix concept



Source: own processing

However, the curent open innovation strategy in most European countries based on the attention to user need, various types of networking and interactions among local bodies have been questioned and does not alwyas bring enough support to SMEs. Our concept highlights the use of various resources which are shared and used accros the network in order to fulfill the common objective i. e. enhancing the innovation in the region.

3 Innovative Network Centred approach

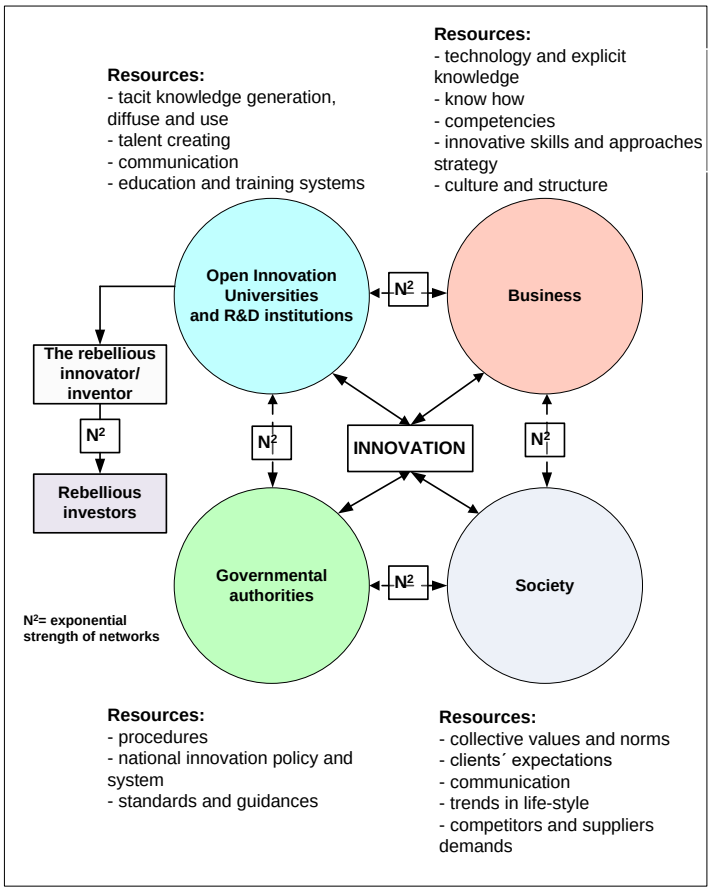
Open innovation challenged some elements of the traditional view of innovation management, with its primary focus on the internal aspects of innovation. In our concept we build up on the main concept of open innovation developed by Chesbrough (2003, 2014) which assumes that corporate innovation activities are more likely an open system than the traditional vertically integrated models, and the external partners and sources contribute to new knowledge creation as the base for innovation. This fundamental assumption composed newly developed an innovative network – centred approach for addressing OI that goes beyond the traditional vertically integrated or management-centred approach employed in the most previous work. All stakeholders are acknowledged and the input of the external stakeholders including their activities and all resources are related to educating and supporting OI.

"*Innovation is a multi-factor, multi-level game to be studied in an interdisciplinary context*", as Shapira, Smits & Kuhlman (2010) stated. This is provided by the key internal and external factors as the antecedents of innovation. Crucial internal factors the literature has traditionally highlighted strategy, organizational design, leadership or organizational culture (Vrakking, 1990; Damanpour, 1991), creating the innovation potential across the entire organization (Kokavcova, 2011) and more recently, organizational learning (Senge, 1990; Nonaka and Takeuchi, 1995) and market orientation (Agarwal et al., 2003; Hul et al., 2004; Sandvik and Sandvik, 2003). Market orientation is the organization's cultural disposition to develop relationships and obtain information from market and its components (customers, competitors, distributors, customers and other partners). Than disseminate it through the company's departments, and to react to market demands.

As the knowledge becomes an increasingly important part of innovation, we suggest an innovative network centred approach (academia – business – government – society) that can help less experienced individuals and organizations acquire new knowledge and experience not only on the national level, but also across the European community.

Open innovation concept has had strong links to resource – based view of the firm as well as it relates to social network theory. Various stakeholders and partners whose are engaging in OI provide dynamic capabilities (resources) to allow firms to capture the opportunities. The network approach for OI shifts the dyadic interactions between just two partners towards the collaborations with external networks, ecosystems and communities. West (2014) shows that network forms higher value creation and examined how open innovation is practiced by firms working within various network forms.

Fig 2 Innovation Network Centered Approach



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The firms can also encounter multiple barriers, originating in their external environment, such as legislation and regulatory framework, rigid perceptions and habits of users and clients, difficulties in collaborating, lack of resources, scarcity and high cost of creative and skilled labour.

As we mentioned above, the open innovation is breaking from the past linear innovation model towards a mash-up process. Creating engagement platforms in different

products and services areas helps approaching zero marginal costs for innovation and lowering significantly the barrier of entrepreneurship. Moreover, the increasing competition and new customer demands make more enterprises move themselves from traditional business models (based on products) towards "new models" (based on services).

4 New Concept of Open Innovation Model

The innovation is critical for the economic efficiency of all organizational partners i.e. universities, companies as well as for the nations and society. At the same time, it is one of the key economic criteria for long-term prosperity, particularly in dynamic markets. The rationale behind this idea is that innovation often serves to deal with the turbulences of the external environment. To survive in Schumpeterian environments, organizations must be able to cope with increasing complexity and high – velocity change (Brown and Eisenhard, 1995). In these contexts, companies with the capacity to innovate will be able to respond to these challenges faster and to exploit new products and market opportunities better than non – innovative companies (Brown and Eisenhard, 1995; Miles and Snow, 1978). Thus, it is commonly perceived, that organizational innovation will have a positive impact on its performance.

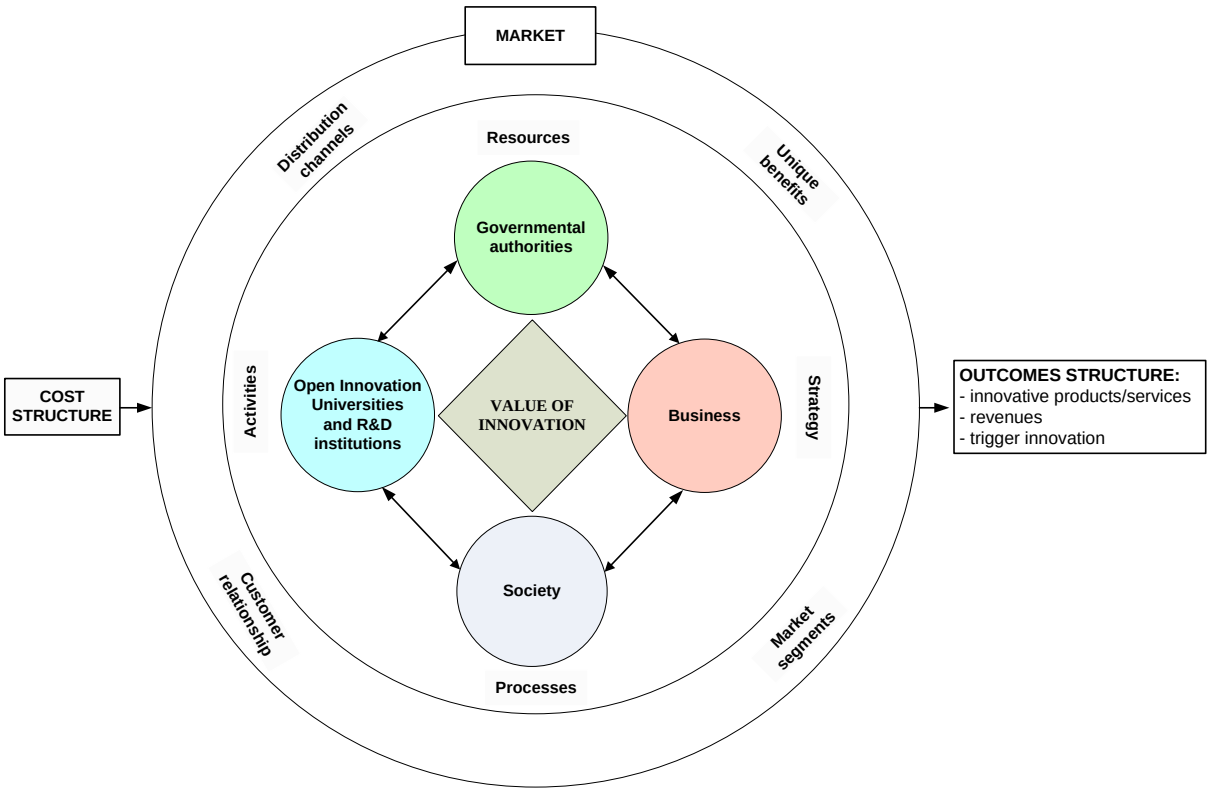
In the past, innovation was understood as a linear process, with research, development and the outputs of new successful products standing on the same level (Staudt, Auffermann, 1999). Nowadays, the innovation process is characterised by Rothwell (1994) as the System Integration and Networking Model (SIN model). This model also represents an intensive transition to electronic means – advanced companies use IT methods in order to support and speed up the innovation process.

Felin and Zenger (2014) have looked at the governance implications of open innovation. In general, the findings suggest that increased linkages to and knowledge flows from various external partners, particularly in uncertain environments, lead to improved innovation outcomes (West and Bogers, 2014). Fey and Birkinshaw (2005) argued and found out that a firm's R&D and innovation performance increases as more relational governance modes are utilized, such as linkages to alliance partners and universities. The central argument is proposed whether we are talking about formal governance forms such as JV, strategic alliance, CVC investment or informal or informal network type of partnership, an increase in the number of external linkages and breath of search can be beneficial outcomes for organizations striving to innovate. Along these lines, Leiponen and Helfat (2010) also find

that an increase number of external knowledge sources lead to increased innovation and better financial performance.

As we have already stated, to develop an innovation and create a value for it, it requires a complex approach. As these challenges become more complex for the company, the business adopts governance that facilitates the extensive knowledge sharing and various resources to be available. The managers face a fundamental choice concerning how to govern this process of acquiring the knowledge, resources and convert them into valuable outcomes.

Fig. 3 Open Innovation Model



Source: own processing

All stakeholders are acknowledged and the input of the external stakeholders including their activities and all resources are related to educating and supporting OIM. SMEs engaging in OIM can encounter multiple barriers, originating in their external environment, such as legislation and regulatory framework, rigid perceptions and habits of users and clients, difficulties in collaborating, lack of resources, scarcity and high cost of creative and skilled

labour. The succesfull implementation of the OIM concept depends on the mutually agreed objectives and weel developed trust in this kind of collaboration between all actors.

Conclusion

Open innovation challenged some elements of the traditional view of innovation management, with its primary focus on the internal aspects of innovation. In our concept we build up on the main concept of open innovation developed by Chesbrough (2003 - 2014) which assumes that corporate innovation activities are more likely an open system than the traditional vertically integrated models, and the external partners and sources contribute to new knowledge creation as the base for innovation. This fundamental assumption composed newly developed an innovative network – centred approach for addressing open innovation cocnept that goes beyond the traditional vertically integrated or management-centred approach employed in the most previous work. All stakeholders are acknowledged and the input of the external stakeholders including their activities and all resources are related to educating and supporting OI.

Considering the role of the knowledge in the process of creation of the innovation, we suggest an Open Innovation Model (OIM) that can help SMES share all resources among themselves within the environement where they all operate.

Various stakeholders and partners whose are engaging in OI provide dynamic capabilities (resources) to allow firms to capture the opportunities. The network approach for OI shifts the dyadic interactions between just two partners towards the collaborations with external networks, ecosystems and communities. The firms can also encounter multiple barriers, originating in their external environment, such as legislation and regulatory framework, rigid perceptions and habits of users and clients, difficulties in collaborating, lack of resources, scarcity and high cost of creative and skilled labour.

The innovation is critical for the economic efficiency of all organizational partners i.e. universities, companies as well as for the nations and society. At the same time, it is one of the key economic criteria for long-term prosperity, particularly in dynamic markets. The rationale behind this idea is that innovation often serves to deal with the turbulences of the external environment.

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