

IMPLEMENTATION OF OPEN INNOVATION PRACTICES IN UKRAINIAN SMALL AND MEDIUM-SIZED ENTERPRISES

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Abstract: Successful innovation is a major driver to enhance the performance of the company, so nowadays organizations try to strengthen their competitive positions through cooperation and collaboration across networks and strategic partnerships, in line with the open innovation framework. Most recent studies of open innovation focus mainly on the firm level of large multinational technology corporations, but with increasing outsourcing, crowdsourcing and networking, the management of open innovation techniques in small and medium-sized enterprises (SMEs) is becoming more important. This paper intends to explore the major trends of innovation activity in the Ukrainian SMEs sector and to define trends towards open innovation concept realization.

Keywords: SMEs, innovation activity, open innovation, innovation cooperation.

INTRODUCTION

In modern turbulent economic reality, given the tendency for network technologies to expand and the transfer of knowledge, the principles of interaction between business actors are changing drastically. Small innovative companies are not able to survive and provide their competitive advantages in isolation and need to use external technologies or ideas to complement their own internal efforts. It is essential to cooperate or collaborate to be successful in innovation activity nowadays. That is why open innovation tools “are no longer a source of competitive advantage but have become a competitive necessity” [1].

Open innovation has been marked as the new imperative for creating and profiting from technology, “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation respectively” [2]. Open innovation involves several key elements which include-networking, collaborating,

research and development (R&D). Competitive advantage often comes from inbound open innovation: today companies should not rely exclusively on their own R&D, as pointed out by *H. Chesbrough* and *A. K. Crowther* [3]. The open innovation model allows ideas to come from other sources and in this context innovation projects can be initiated internally or externally at any stage of the innovation process by the firm. Open innovation means that SMEs can extend their networks by cooperating with business partners, including distributors, suppliers, clients, competitors, universities, research institutions and even government agencies to ensure access to external ideas and to exploit the commercialization of their products. In this light, cooperation with other business players may complement the internal efforts of the firms, put the SMEs on a sound path to the market, reduce product development costs and also mitigate managerial difficulties. In a similar vein, the open innovation model allows managers to bring external knowledge into a firm and also put their internal ideas outside, so as to be more efficient in their striving to create an innovative product and establish its market commercialization. But it should be mentioned that SMEs practicing open innovation often face inherent managerial challenges, including the difficulty in finding the right cooperation partners, the complexity in evaluating early-stage technologies, the imbalance between open innovation and the daily business-model and motivating individuals to generate and contribute spillovers [4].

To our knowledge no study exists for Ukraine aiming at empirical investigation of the underpinnings, opportunities and barriers of open innovation implementation in the SMEs sector. The purpose of this paper is to investigate the trends towards open innovation in small and medium-sized Ukrainian enterprises. The paper intends to explore the theoretical and empirical discussion of open innovation practice of Ukrainian SMEs in order to provide answers to the main research questions. Our set of research questions is as follows: what are the major trends of innovation activity in the Ukrainian SMEs sector and are there any differences in innovation cooperation partners regarding a firm's size.

Given the limitations of information databases for the measurement of open innovation processes, the key conclusions were made on the results of the analyzed statistical data collected from Community Innovation Surveys which took place in Ukraine during 2010-2012 and 2012-2014 according to the European Union methodology.

SUMMARY OF FINDINGS

Small and medium-sized enterprises play a key role in the economic growth of many countries because they are the main source of employment. The favorable business environment in developed economies makes it easier for SMEs to be more successful in the process of creating and commercializing their innovation products than in developing economies. The main factors attributed to a conducive business environment in the developed world include legislative framework, the availability of the needed resources (human, financial, informational and technological), governmental financial support, and the proper innovation infrastructure. On the other hand, a non-conducive business environment is characterized by obsolete methods and technologies, too much bureaucracy, negative perception on the part of the customers or entrepreneurs, and the inability to gather much needed support and partnership.

The innovation process in developing and emerging countries is determined not only

by the level of technological and market complexity, but also by the institutions, infrastructure and framework conditions where firms operate. Due to geopolitical uncertainties and complex economic issues, business framework conditions for entrepreneurship and innovation development in Ukraine are mediocre – in the 2015 Global Innovation Index (GII) Ukraine ranked only 64th [5]. In the past years Ukraine has performed well in terms of human capital and research, being well above other lower-middle-income innovation achievers, in particular by reason of its performance in tertiary enrolment and knowledge creation. Ukraine's business framework weaknesses in relation to innovation policy include poor infrastructure (127th in GII sub-index), rigid innovation linkages (105th in GII sub-index) and market sophistications (89th in GII sub-index). According to the 2015-2016 Global Competitive Index (GCI), Ukraine scores well on indicators like quality of the education system and scientific research institutions, on the other hand, the position of Ukraine is weak in effectiveness of taxation on incentives to invest, affordability and availability of financial services, intellectual property protection and the state of cluster development [6].

Among the main constraining factors of innovation activity in Ukraine are financing difficulties, the lack of access to technology and relevant market information, incomplete innovation infrastructure, poor management and improper planning. It is also possible to mention the underdeveloped level of innovation culture and low motivation to innovation activity as another element obstructing the innovation environment for Ukrainian SMEs.

Table 1: Comparison of the most important indicators of small enterprises innovation activity in Ukraine between 2010-2012 and 2012-2014 [7; 8]

	as % of all small enterprises	
Indicator	2010-2012	2012-2014
Share of innovation active enterprises (total)	16.9	11.3
Share of technological innovators (with product, process, abandoned and not yet finished innovations)	6.2	4.0
Share of product innovators	1.1	-
Share of process innovators	2.0	-
Share of non-technological innovators (with marketing and organisational innovations)	10.6	5.0
Share of total turnover that is generated by enterprises with innovation activities	19.2	-

“-” Data are not available for given period

In order to answer the research questions we need to make out specific quantitative indicators for evaluating the use of the open innovation approach which are available from relevant statistical data. Before examining open innovation practice, general trends of innovative performance in Ukrainian small enterprises should be identified to clarify the opportunities and obstacles relating to the implementation of open innovation tools. The most recent data available from the State Statistics Service of Ukraine is taken from the 2012-2014

Community Innovation Survey. Results show that during the period 2012 and 2014 around 11% of all small enterprises (less than 50 employees) were innovative (Table 1). Compared to the share of innovative firms operating in developed economies such an indicator is critically low. Overall, it was found that just 4% of all small enterprises engaged in the industrial and services sectors in Ukraine were technologically innovation active in the reference period (had carried out a product innovation or a process innovation).

Only one in five of all small enterprises in Ukraine, around 20%, carried out in-house R&D between 2010 and 2012 (Table 2). The most common form of technological innovation was acquisition of machinery, equipment and software – nearly three in every four small enterprises indicated they engaged in this activity. This compares with 78.9% of medium sized enterprises and 80.7% of large enterprises. Over the survey period small firms devote, on average, 24% of their innovation expenditure to in-house R&D efforts as compared with 5% to purchase of external R&D and only 4% to acquisition of other external knowledge.

Table 2: Percentage of enterprises engaged in technological innovation expenditure in Ukraine by sector and size class, 2010-2012 [8]

Type of innovation activity	as % of all enterprises with technological innovations				
	Sector of activity		Size class		
	Industry	Services	Small (10-49)	Medium (50-249)	Large (250+)
In-house R&D	22.1	19.9	20.7	18.1	25.8
Purchase of external R&D	10.5	9.6	7.4	7.1	18.8
Acquisition of machinery, equipment & software	74.6	82.4	74.6	78.9	80.7
Acquisition of other external knowledge	9.9	13.9	11.0	9.5	12.5
Training for innovative activities	20.3	25.1	17.8	20.8	29.8
Market introduction of innovations	12.9	17.7	12.8	12.1	18.0
All other expenditure	23.0	23.5	20.4	21.1	30.4

Open innovation works effectively with cooperation as well as with collaboration. According to the results from the 2010-2012 Community Innovation Survey, around one in five Ukrainian companies with technological innovations in the industrial and selected services sectors were engaged in innovation co-operation (Table 3). 17.2% of innovation active small enterprises were engaged in some co-operative activity when developing their product and process innovations, 16.2% of all small enterprises were engaged in innovation co-operation with local partners, compared with only 3.8% of firms that were engaged with partners in the European countries over the survey period.

Table 3: Location of co-operation partners for innovative enterprises in Ukraine by sector and size class, 2010-2012 [8]

Country / Region	as % of all enterprises with technological innovations				
	Sector of activity		Size class		
	Industry	Services	Small (10-49)	Medium (50-249)	Large (250+)
Ukraine	20.3	20.7	16.2	17.7	33.2
European countries	7.7	5.5	3.8	5.1	16.4
United States	1.7	4.2	2.0	1.0	5.1
China / India	2.3	1.6	1.0	1.4	5.0
All other countries	6.2	4.3	2.3	3.7	14.7
Total	22.5	21.4	17.2	19.4	37.5

One of the main advantages of the open innovation model is the possibility of accessing a wide range of technical and market knowledge from different sources. In order to specify the prerequisites of open innovation in Ukraine we intend to investigate how important are possible sources of information and knowledge for innovation activities for SMEs. Using category classifications which are comparable to *K. Laursen and A. Salter's* [9], the innovation related information and knowledge sources were grouped into four different types (internal, market (business networks), institutional, sector and specialized information). The distribution of firms (as a percentage of all enterprises with technological innovations), according to the importance they attributed to the relevant information sources is presented in Table 4.

There is a definite correlation between the level of significance of the innovation related information source and potential partners for innovative collaboration. Based on the survey results, the most important source of information for innovation activities for all enterprises regardless of firm size is the internal type (it was rated as "high" by around one in three Ukrainian companies with technological innovations). Around 23% of small firms located in Ukraine indicate the knowledge they draw from the market environment is highly important (suppliers, clients, customers or end users are among the business network actors). Next, "conferences, trade fairs, exhibitions" with 13.6%, and "competitors or other businesses in your industry" with 10.55%, are the sources considered as important by the respondent small enterprises with technological innovations. The relatively low percentage for universities and government research institutes seems to suggest that universities and business sector relations are not a matter of concern for a vast majority of Ukrainian firms. There are difficulties in public policy of technology transfer and diffusion, so that it is necessary to provide an enabling supporting framework to overcome the gap between research, innovation and business creation.

Table 4: Ukrainian enterprises which rated importance of relevant information sources for innovation as “high” by sector and size class, 2010-2012 [8]

Type	Innovation related information source	as % of all enterprises with technological innovations				
		Sector of activity		Size class		
		Industry	Services	Small (10-49)	Medium (50-249)	Large (250+)
Internal	Within your business or enterprise group	28.0	37.3	29.9	26.7	34.3
Market (business networks)	Suppliers of equipment, materials, services or software	23.2	31.0	23.4	24.3	28.7
	Clients, customers or end users	20.3	26.8	22.9	18.4	22.8
	Competitors or other businesses in your industry	10.1	11.6	10.5	9.1	11.7
Institutional	Consultants, commercial laboratories or private R&D institutes	4.9	6.0	4.7	4.2	6.9
	Universities or other higher education institutes	1.9	3.8	2.0	1.8	4.4
	Government or public research institutes	4.6	5.7	3.9	3.9	7.5
Sector and specialized information	Conferences, trade fairs, exhibitions	14.1	19.2	13.6	13.8	19.5
	Scientific journals and trade/technical publications	8.9	11.6	8.4	7.9	13.3
	Professional and industry associations	4.2	4.0	3.8	3.9	6.7

Exploratory results seem to convey the assumption that the innovation “openness” level of the respondent sample of Ukrainian enterprises is rather low. These business entities tend to regard their own internal information as a critical source of knowledge in innovative activities. In this regard, it is observed that companies primarily tend to use external search for new knowledge and then develop the technology with their own efforts and bring it to the market. Using the open innovation terminology, SMEs are more inclined to the “outside-in process” than to the “coupled process” [10].

Open innovation practices in the business sector can be characterized by intensive cooperation of various actors through network relationship and greater user and customer involvement in the development of new products. Unfortunately, Ukrainian SMEs are not demonstrating high level of openness to external knowledge, to new business models and

modern organizational principles. Among the key reasons for the underdeveloped open innovation community in Ukrainian companies is a fear of operating openly, and a lack of knowledge about innovation processes and managerial skills for such type of cooperation.

Regarding a firm's business sector, a few differences in the industry and service sectors can be identified. The results show that service firms are statistically more frequently involved in open innovation activities and engaged in external participation. Many of the firms seem to collaborate with the suppliers of equipment, materials, services or software, clients, customers and end users, whereas the more demanding partner types like competitors, universities or research institutes are used much less frequently. These results are illustrated by the more extensive use of relevant sources for collecting information regarding to innovation activity. Statistically the large firms are more actively involved in innovation collaboration and cooperation with different types of partners such as research institutions, consultancy firms and commercial laboratories. This may be due to the financial resources supporting the innovation collaboration – powerful corporations can afford to pay for consultancy services or joint R&D with other actors in the innovation process.

CONCLUSIONS

Overall, Ukrainian SMEs engage in a narrow range of inter-organisational relationships in the context of open innovation. A vast majority of businesses are rather closed in their innovation processes, and this tendency has direct implications for their ability to introduce new products and services to the market. Moreover, in the sector of SMEs additional problems arise in the implementation of the open innovation model, since the vast majority of these firms are not familiar with the appropriate tools and strategies for such introductions in their business.

Based on the results of research, the tendency towards open innovation seems to depend on firm size – larger companies are more actively involved in innovation collaboration with different partners than smaller firms. Because of their specific characteristics, particularly limited resources, SMEs lack the necessary infrastructure for “closed” innovation processes, based on the development of innovations within an R&D department. Although SMEs are relatively inclined to provide innovation activity in a more open way, the statistical surveys in Ukraine show that open innovation practice is happening primarily among large companies rather than smaller businesses. The larger companies demonstrate the stronger adoption of open innovation techniques: while big corporations are already actively practicing open innovation, small businesses are still just moving in this direction. Thus, extending this line of research to investigate the open innovation practice in large companies would provide a more comprehensive picture of Ukrainian business reality.

It is important to highlight that these findings need further validation and at this stage the paper does not attempt to set managerial recommendations for the acceleration of innovation processes, rather it is aiming to investigate the open innovation prospects in Ukraine, using quantitative research.

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