USER-DRIVEN INNOVATION: TOWARDS A NEW INNOVATION PARADIGM*

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ABSTRACT

The holistic approach to innovation includes establishing a wide range of interactions among different actors which implies development and expansion of methods, approaches and tools for improving the innovation. This paper analyzes the impact of customers and users on promoting innovation of companies. In this context, the authors advocate different methods and approaches for establishing interactions between the customer and the company and for providing the customer involvement in the process of innovation. Therefore, the paper aims at presenting an analytical overview of the methods and tools by which users influence companies' process of innovation. It will also propose a conceptual framework as regards the user involvement in different stages of the innovation process.

Keywords: *user-driven innovation tools and methods, innovation process, customer input*

JEL: O30, O31

1. INTRODUCTION

Although the overall development of the society is driven by innovation, yet the innovation debate becomes widely held in the second half of the 20th century when the forces of change in either economic or cultural context are intensified globally. Nowadays, innovation is a driving force of companies' success and competitiveness. They are becoming increasingly aware of the relevance of innovation in boosting the efficiency and creating a better competitive position in the global market and therefore make their efforts to gain a global innovation advantage. Within a dynamically changing environment, company's success is quite determined by interactions it establishes with the environs, primarily other companies, institutions and users as a precondition for generating new ideas and fostering technological change. Nowadays, the interactive nature of innovation and absorption of external knowledge become increasingly important for improving the innovation performance of companies. Companies find that the conventional approach (innovation created in research and development (R&D) centers) turns out to be too narrow and deterministic. Therefore, they opt for using all other resources and potentials to improve innovation. The innovation solutions are currently generated from various sources and include different actors. This is an approach embedded in the concept of open innovation that allows companies to transfer ideas originating from external sources and their commercialization. Actually, central idea within the concept of open innovation is related to the fact that most entities cannot rely entirely on their own research (innovation), therefore and in order to succeed, most entities will have to collaborate with other entities or purchase innovations

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outside the company (Chesbrough, 2005). It increasingly emphasized user role and contribution in the innovation process. Although the literature covers different aspects of innovation, yet recent studies observe the issues related to user involvement in this process. In fact, the new innovation discourse identifies customers as a very important driving force of innovation (Kaulio, 1998, pp. 141-49, Thomke and Von Hippel, 2002, pp. 74-81, Magnusson, 2003, pp. 228-238, Hippel and Katz, 2002 pp. 821-834). Hence, the contemporary research is increasingly focused on studying the role of users in initiating, designing and implementing the innovation process. The user knowledge is of critical importance for developing new concepts, products and services with consequent positive implications for companies' growth and competitiveness. By including users in the innovation process, companies will be able to tap the knowledge from users – tacit and hidden knowledge which is hard to codify, as well as explicit knowledge which is easy for the user to communicate and articulate (Bisgaard and Høgenhaven, 2010, p. 14). According to Von Hippel, democratizing denotes an active participation of users in the process of innovation (Von Hippel, 2005, pp. 121-133). In this context, this paper discusses the role of users in companies' innovation process, as well as the methods and approaches by which they participate in such a process. The main contribution of the paper is in the efforts to design a methodological and conceptual framework that is going to identify and classify the types of user involvement in all stages of the innovation process.

2. USER-DRIVEN INNOVATION: CONCEPTUAL FRAMEWORK

Nowadays, the increasing awareness of customers and users, based upon the wide opportunities to exchange and use the globally available knowledge, makes them imposing higher requirements for products and services. Companies should provide openness in the innovation process and ought to establish interactive relations with their customers and users. It means they have to understand the user behavior and include them in the process of innovation so as to provide solutions for meeting their needs. The innovation process begins with the users – understanding their problems and finding solutions, but also conceiving their behavior indicating the products and services a certain company should develop (OECD 2009).

The role of customers in innovation of companies does not refer only to the innovation that companies design according to their ideas, proposals and requirements, but also to the innovation resulting from the customer involvement in collaboration and the value co-creation. Hence, innovation of companies is largely determined by: a) perceiving the needs, tastes and requirements of customers and building them into appropriate innovative solutions; b) establishing interactions with users and value co-creation; c) implementing innovation generated by users. By making customers and users involved in the process of innovation, companies may use their knowledge and identify their needs to produce successful innovative solutions. The more recent studies have emphasized that "firms are supposed to implement methods of interaction that allow them to transfer and absorb customers' and users' tacit, implicit and explicit knowledge" (Fuchs et al., 2011). Thus, many of today's innovative solutions originate from the interactions between companies and customers, i.e., organizations and customers create innovation together (Desouza et al. 2008). Such an approach of customer co-design (co-creation) means that customers are integrated into value creation by defining, configuring, matching, or modifying an individual solution. Co-design activities are performed in an act of company-to-customer

interaction and cooperation (Franke and Piller, 2004, pp. 401-415; Franke and Schreier, 2002, pp. 225-234; Khalid and Helander, 2003, pp. 247-266; Reichwald et al., 2004; Tseng et al., 2003, pp. 509-519; von Hippel, 1998).

Likewise, the contemporary practice indicates that users may possibly be direct innovators who "often develop products for themselves. If the user innovation is validated through adoption by others, than the companies refine and commercialize the innovation for sale to a growing market of users. This consumers-as-innovators pattern has led to the framing of a new innovation paradigm, in which consumers play a central and very active role" (von Hippel et al., 2011, pp. 27-34). All these aspects of user involvement in the innovation process are incorporated into the concept of customer-driven (user-driven) innovation which is primarily based upon understanding the customer needs and embedding them into appropriate innovative solutions. The initial steps in this process include systematic mapping of "unsatisfied customer needs. Ideas are developed into possible solutions, and the production and market opportunities are assessed. This forms the basis for drafting an innovation strategy, which is then implemented. Such an innovation process is referred to as user-driven innovation" (Rosted 2005, p. 10). The contemporary research suggests several general characteristics of user-driven innovation in which it differs from the other approaches. These features include: a) a strategic focus on consumer pull (vs. technology push); b) revenue-enhancing activities (vs. cost-cutting activities) by developing solutions that better meet consumer needs: c) use of multiple skills and perspectives in the innovation process; d) more direct involvement of the user/consumer in the innovation process; e) requirements for an open and collaborative business environment (Nordic Council of Ministers, 2006, p. 12). This concept foresees the role of users in the context of a) the utilization of user participants, or co-creators, as well as a resource in innovation processes, b) user innovations produced by users themselves for their own needs (Kuusisto and Kuusisto, 2010).

The technological developments and globalization have significantly increased the opportunities, abilities and willingness of users to actively participate in the innovation process. Nowadays, "users have many opportunities for creating, communicating and collecting information and knowledge related to the result as well as the process of innovation (Still et al., 2012, pp. 1740-1746). These types of interactions can actually be seen as one of the defining characteristics of the different manifestations of user-driven innovation" (Still et al., 2012, pp. 1740-1746).

According to Kaulio (1998), there are three types of customer involvement in companies' innovation process. *Design for customer* includes designing products on behalf of customers. Companies provide data about customer needs mainly by conventional market research methods or sales feedback. *Design with customer* implies designing products based upon customer preferences with various innovative solutions and concepts being tested and evaluated by customers, and companies make further improvements according to the customer reactions. The third type, *design by customer*, refers to an active involvement of the customer in designing innovative products and processes, often by tools that are either provided by the firm or by customers themselves. The manufacturer is either empowering its customers to design a solution by themselves or is implementing methodologies to efficiently transfer an innovative solution from the customer into the company domain. (Franke and Piller, 2004 pp. 401-415; Thomke and von Hippel, 2002 pp. 74-81).

3. METHODS AND APPROACHES OF USER INOVOLVEMENT IN INOVATION PROCESS

The literature identifies a range of methods for the customer and user involvement in the innovation process. They could be classified according to different aspects and depending upon the extent and kind of involvement. The users' involvement in innovation process is accomplished on many levels with different intensity and implications. Their role covers a wide range of activities characterized as informative, consultative and participative (Damodaran, 1996). In this context, several approaches are emphasized as being analytically observed in contemporary studies focused on user-driven innovation.

Eric von Hippel is amongst the authors giving a significant contribution in this field. He identifies users as innovation generators and analyzes their role in developing new product, services and processes. By von Hippel, the especially important role in stimulating innovation have the so called lead users that are characterized as users who face needs "that will be general in a market place – but face them months or years before the bulk of that marketplace encounters them, and lead users are positioned to benefit significantly by obtaining a solution to those needs" (von Hippel, 1988, pp. 102-115). The lead user method actually allows integration into the innovation process of selected users able to anticipate the market needs earlier than others. Seeking to better meet their needs, they develop innovative ideas and concepts later adopted by the other users. Generally, there are two approaches by which companies might benefit from the lead users innovation. Under the first approach, lead users independently design innovative solutions and then transfer them to manufacturers allowing for their commercial exploitation. Contrary, the other approach covers interactive innovative solution design of lead users and companies. The initial stage of this collaboration includes identification of lead users or lead experts, followed by a phase of developing a common concept together with identified lead users or lead experts in a workshop, which builds on the idea of an interactive value creation process, in which an innovative solution is developed collaboratively between manufacturer and customers (Diener and Piller, 2009, pp. 10-42).

According to Piller and Ihl (2009), the direct individual customer involvement in the new product development may be achieved by two approaches: dyadic front-end customer innovation and dyadic back-end customer innovation. The first approach is based upon establishing interactions between the firm and customers, whereby customers submit their concepts and ideas by means of *idea contests* (Piller and Walcher, 2006, pp. 307-318; Toubia et al., 2007, pp. 342-360). The process of selection follows thereafter, i.e., *idea screening* for deciding on solutions to be pursued further (Toubia et al., 2007, pp. 342-360, Piller and Ihl, 2009, pp. 21-23). At dyadic back-end customer innovation, customers make use of toolkits to transfer their needs in concrete solutions. Companies exploit the innovative solutions obtained for producing and delivering products according to the user needs and preferences (Franke and Piller, 2004, pp. 401-415). Toolkits are the interaction platform permitting the customers to design products without getting into direct personal contact with the manufacturer. Following Franke and Schreier (2002), companies make use of two toolkit types: (1) toolkits for user innovation enabling users to create new products and solutions by combining the manufacturer's standard modules and components so as to meet their needs or the trial-and-error experimentation and (2) toolkits for user co-design and customization mainly used "for product individualization and adoption, rather than

developing new goods and services" (Piller and Ihl, 2009, pp. 26-29). Over against this method which observes the role of individual customer in innovation process, the methods of *network (community)-based front-end customer innovation and network (community)-based back-end customer innovation* discover the impact of communities in developing innovative ideas. The method of *network (community)-based front-end customer innovation* is based upon: *a) product-related discussion forums* by which customers predominantly exchange their using experience and *b) communities of creation* primarily concerned with generating novel ideas and concepts (Sawhney and Prandelli, 2000, pp. 24-54). *Network (community)-based back-end customer innovation* – the level of elaboration needed for customer solutions to be valuable at the back end of new product development process may further increase by allowing for network collaborations within customer communities. In this context, the practice where multiple individuals come together to produce a common good or service is usually referred to as peer production. One can talk about the crowdsourcing. Following Howe (2006b) crowdsourcing "represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call".

Collaborative forms of innovation are also encouraged by establishing *living labs* as a method and innovation infrastructure permitting a collaboration network among stakeholders for a new product and service development. Living lab stands for "an open research and innovation ecosystem involving user communities (application pull), solution developers (technology push), research labs, local authorities and policy makers as well as investors" (Pallot et al., 2010, pp. 1-10). "Living Lab is a research concept supporting collaborative open innovation together with different parties, users, consumers or people willing to participate in Living Lab activities" (Fulgencio et al., 2012, pp. 1-6). Nowadays, living labs are becoming more attractive since they are significantly expanding the opportunities and space for innovative solutions. The role of living labs is especially emphasized as a resource enabling active user involvement in the innovation process. Living labs provide research facilities and tools for incubating innovative ideas, support for developing ideas, testing and co-design. Hence the recognition that Living Lab represents a user-centric research methodology.

Depending on whether the innovation impulse comes from explicit or tacit needs and user problems and thereby direct or indirect user involvement in the innovation process, one may highlight the use of four generic methods: user exploration, user participation, user innovation and user tests. An innovation project taking place within a company might use more than one of the four user driven innovation methods throughout the entire innovation process (Bisgaard and Høgenhaven 2010, pp. 13-16). Following Reichwald et al. (2003), the customer contribution may possibly be identified as: decision, information and creation. Decision involves the activities aimed at deciding or evaluating given facts and it might be completed by closed-questionnaire surveys or standardized voting method. Information refers to activities permitting customers to articulate preferences or solutions concerning the product development process. Giving information allows customers to express their personalities, needs, preferences or solutions to a specific problem. This contribution is mostly done by focus groups, idea competitions, etc. Creation implies a possibility of creating own innovative solutions or the process of co-creation. Prototypes built by customers or toolkits for the configuration of products are examples of creation based customer contribution.

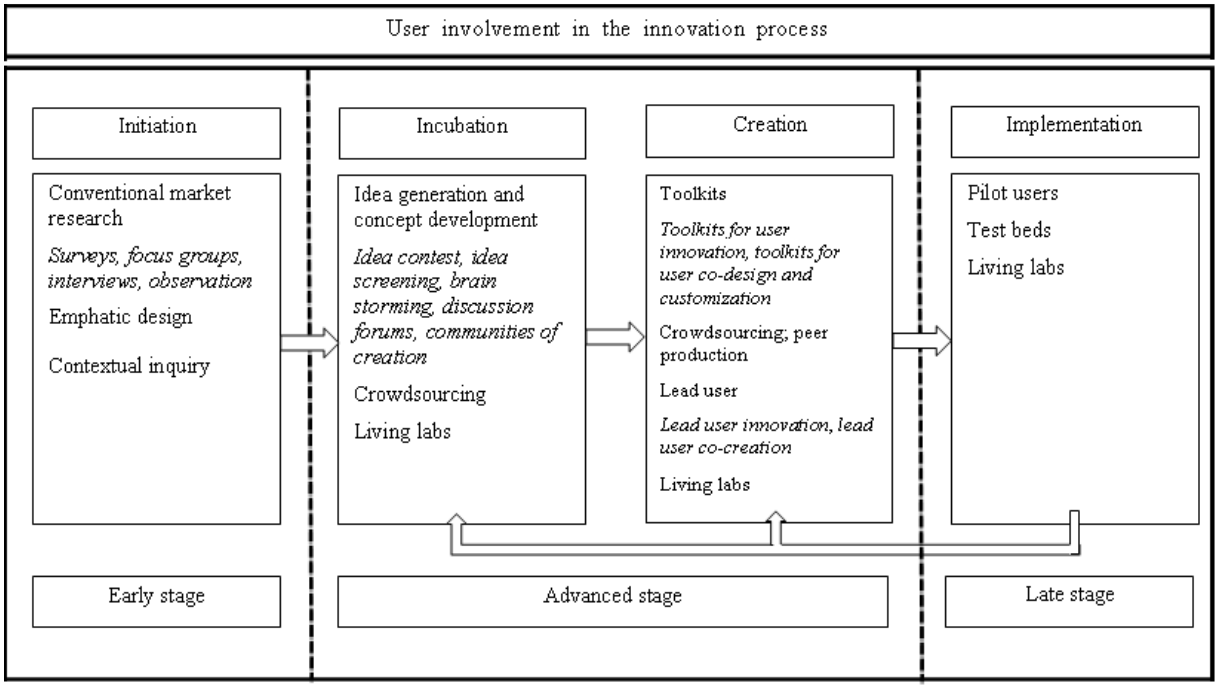

Figure 4.1. Stages of the user involvement in the innovation process

On a similar methodological basis a classification is set about the modes of interacting with customers in the new product development (Piller et al., 2011, p. 7): (1) "Listen into" the customer domain, (2) "ask" customers, and (3) "build" with customers. The "listen into" mode provides for designing an innovative product according to needs, requirements and customer preferences. Firms access customer information by analyzing sales data, surveying sales personnel, but also by methods to scrutinize customers by observation (empathic design). In the next phase called "ask", customers are explicitly asked for direct inputs for a firm's innovation process via several methods of evaluating and testing the proposed innovative solutions. Finally, the "build" mode refers to customer direct involvement in designing and developing innovative products or services.

4. METHODOLOGICAL FRAMEWORK: FROM DISCTINTIVE PERSPECTIVE

The analysis on the methods of user involvement clearly indicates that they can provide their own input at different stages of innovation process. The user participation varies as regards the intensity of activities and the knowledge input. Within the early stage of the innovation process, the intensity of involvement is relatively weak and mainly covers basic knowledge input.

Later at an advanced stage, the users participate actively with their ideas and innovative solutions generated independently or as innovative partners over and done with the process of co-creation. In this context, we have classified the stages into four different groups at which the methods of user involvement have been identified for each of different phases (Figure 4.1).

The first stage refers to understanding and gaining insight into customer needs as a prerequisite for further design of concrete innovative solutions. At this stage, companies often use the conventional market research methods or the empathic design approach to identify the explicit or latent customer needs. The context of market research is primarily focused on applying traditional techniques, such as surveys, focus groups, etc. Thereby, companies access the relevant customer information about their needs, requirements and tastes to be further developed in new

products and services. Yet, the customers may possibly not recognize, describe or explain their needs. In such cases, companies make use of the empathic design approach to obtain the relevant information as an important input in the innovation process. The empathic design method identifies not explicitly stated user needs and motivations to be embedded into appropriate innovative solutions. In fact, it allows for the unarticulated user needs to take shape into innovative products and services (Dorothy et al., 1997, pp. 102-113). Besides the empathic design, companies may also use the contextual inquiry method that uncovers who customers really are and how they work on a day-to-day basis, but also permits to understand the customers: their needs, their desires and their approach to the work (Beyer and Holtzblatt, 1998, pp. 32-41).

The incubation stage refers to generating new ideas to improve the existing products, services and processes or for creating new products and services. In practice, companies have at their disposal a wide range of methods, such as: idea contest, idea screening, discussion forums, communities of creation, crowdsourcing, living labs etc.

At the creation stage, users may offer innovations either independently (toolkits for user innovation, lead user innovation), or design interactive company-user innovative solutions (toolkits for user co-design and customization, lead user co-creation). In practice, lead users often independently develop or modify products to meet their needs, while such innovation is later being subject to commercialization (von Hippel, 2005, pp. 19-33). Besides, companies make use of toolkits to provide a direct source of innovative products and services. In fact, toolkits enable users to do a part of the innovation, within a given solution space (Saugstrup, 2008). Toolkits provide users with freedom to develop new products/services through iterative trial-and-error. It means that users generate preliminary design, develop simulation or prototype, perform testing and then try to improve it iteratively until they are satisfied (Wakeford, 2004). The strategy of co-creation involves customer as an active partner in the company value creation chain. "In the context of co-creation, knowledge creation and transfer have to be understood as an iterative process involving the construction and de-construction of experience. As such, co-creation processes go through various cycles of value development" (Humphreys et al., 2009).

Implementation refers to the first experience in using innovation and the influence user may perhaps achieve as regards other customers' acceptance of the new product or its possible improvements. Companies traditionally recruit pilot users for the new product testing. The users share their experience with manufacturer and other users, while the companies may use their remarks to improve the products (Bisgaard and Høgenhaven, 2010, pp. 14-17; Jespersen, 2011, pp. 1141–1159). Finally, a test bed method allows users to get in touch with new technology often by showrooms for observing their behavior, and/or a contact is established for identifying certain needs and requirements.

The classification above contains some of more important methods, approaches and tools following on last findings in this field. Yet, given the complex nature of the innovation process, it should not be observed in lines with several consecutive stages, but rather a cyclical process of interactions among various stakeholders for continuous improvements of knowledge, innovative performance and the possibilities for companies to expand their innovation space (Nordic Council of Ministers, 2006).

5. CONCLUSIONS

In today's competitive environment, companies are obliged to search for innovative

solutions providing product differentiation and increased process efficiency as a prerequisite for gaining a competitive advantage. In this context, the role users take in the innovation process becomes more important and it is usually observed in a way complement to other sources of company innovation. The analytical review given above points toward increasingly diversified methods of user involvement in the innovation process, and this certainly expands companies' innovation opportunity.

Although methods are possibly to classify according to different criteria, this paper takes them along the lines of user involvement in different stages of the innovation process. The classification is gradually approached starting from the stage of identifying customer needs up to the final stage of implementing innovative solutions. The proposed conceptual framework aims at increasing the visibility of methods and upgrading the current methodological platforms in order to better understand the customer innovation input.

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