Dorota Jelonek

Czestochowa University of Technology
jelonek@zim.pcz.pl

THE ROLE OF THE INTERNET IN OPEN INNOVATIONS MODELS DEVELOPMENT

Abstract: This paper analyses the new open innovations models: value co-creation model, co-creation experience innovation, user-driven innovation model and crowdsourcing. The chosen internet services which support communication and cooperation between companies and consumers and consumers communities were presented. The aim of the paper is to show that the presented open innovation models are benefiting from the evolution of new alternatives of networking collaboration.

Key words: open innovation model, co-creation model, co-creation experience innovation, user-driven innovation model, crowdsourcing, Internet.

1. Introduction

In literature ideas competitions are discussed, and generally acknowledged as an effective practice for integrating customers into the early stages of the innovation process. Customer integration into innovation activities stands for an important competitive strategy, known as *open innovation* [Chesbrough 2003b, p. 35]. Through the organization of ideas competitions, companies attempt to collect innovative ideas from customers via an Internet-based platform. Lacking are studies that address the design of Internet-based platforms for ideas competitions that typically address the domain of information science. As the technical and organizational design of an ideas competition will influence a customer's participation, design aspects are an important variable for optimizing their successful implementation [Leimeister et al. 2009, p. 199]. Putting research effort into designing Internet-based ideas competitions in general and into supporting active participation in particular is important for research and practice.

2. Open innovation model

Open innovation means making use of resources outside the firm. Users may bring new variety and contexts to the firm's innovation process. Traditional understanding of innovations refers to the commercialization of ideas, concepts or invention, but

the basic assumption is that a company aspires to protect their knowledge resources. This model is defined as a closed innovation model because mutual permeation of knowledge about new technologies and a new solution does not exist between competitive companies. The closed innovation model involves big financial outlays as it is based on the internal research and development work or on exclusively purchased licenses.
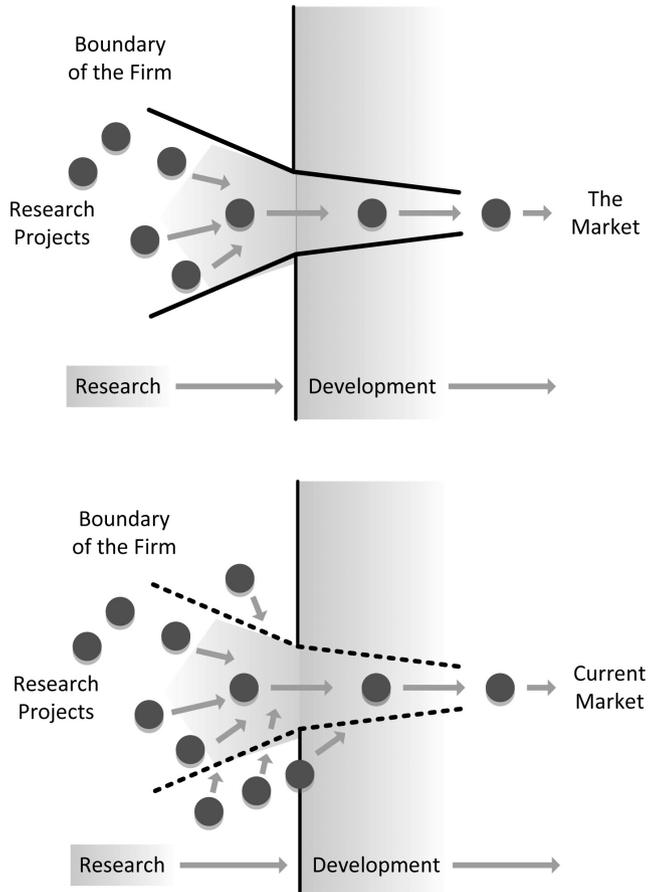
Figure 1. Open versus closed innovation models

Source: adapted from [Chesbrough 2003b, p. 36].

The drawbacks of the aforementioned/described closed innovation model make carrying out research just inside the company justified only in a few branches. The other firms should monitor the progress of knowledge in high-tech companies, in laboratories and at universities, they should purchase patents, licenses and other innovative solutions.

More and more frequently companies change the innovation development policy towards the open innovation model, in which environment's knowledge base is used openly. Companies willingly use research results that have been carried out by external environment entities, they benefit from the open-access knowledge published in the articles, and passed on during conferences and training, also based on research results carried out together with scientists and specialists or on those commissioned for the universities. Figure 1 shows the closed innovation model and open innovation model.

In the open innovation model (Figure 1) both internal and external technological backgrounds are equally essential sources of innovation. The entity's competences and experience in the field of developing definite technology influences the decision on whether to choose own research and development department or the external entities as the source of innovation. In this model the boundaries of the firm are drawn in a dotted line (Figure 1) to emphasize the leakage of boundaries that guarantees organizational openness which enables unimpeded contact in order to exchange knowledge freely with scientific institutions, solution's suppliers and even with competitors.

Table 1 presents the reasons behind the transition from closed innovation to open innovation models, and why companies need a different mind-set and culture to respond to (and benefit from) open innovation.

Table 1. Closed vs. open innovation principles

Closed innovation principles	Open innovation principles
The smart people in our field work for us.	Not all the smart people work for us. We need to work with smart people inside and outside our company.
To profit from R&D, we must discover it, develop it and ship it ourselves.	External R&D can create significant value; internal R&D is needed to claim some portion of the value.
If we discover it ourselves, we will get it to market first.	We do not have to originate the research to profit from it.
The company that gets an innovation to market first will win.	Building a better business model is better than getting to market first.
If we create the most and the best ideas in the industry, we will win.	If we make the best use of internal and external ideas, we will win.
We should control our innovation process, so that our competitors don't profit from our ideas.	We should profit from others' use of our innovation project, and we should buy others' IP whenever it advances our own business model.

Source: [Chesbrough 2003a].

Introducing the open innovation model required recognition of potential sources of innovations. J.C. Linder, S. Jarvenpaa, and T.H. Davenport [2003, pp. 46–48] identified five types of external innovation sources:

– Buying innovation on the market. Organizations such as universities and private research labs offer innovation for sale.
– Investing in innovators. In seeking to benefit from breakthrough innovations, companies take equity positions in organizations focused on small or emerging markets. For example, Nokia has shied away from acquisitions, preferring instead to set up venture funds to invest in companies that complement its own product.
– Co-sourcing. As innovation in some arenas becomes more expensive, companies sometimes band together to share the costs. For example much of Nokia's success with mobile phones stems from innovative co-sourcing through wireless industry associations such as the consortia and technology standardization boards for GSM and 3C. As a way of co-sourcing innovation is also used as the joint venture.
– Resourcing. Some companies support their research staff by contracting with outside suppliers for on-demand talent and innovative new tools.
– Community Sourcing. Companies have begun tapping loosely connected communities of sophisticated users. This approach has been successful in the open-source software industry. Nokia relies on community sourcing for the applications software for its Media Terminal. EBay Inc. uses community-based innovation extensively to identify new sales categories and expand the capabilities it offers customers.

The Internet particularly supports development of community sourcing channel. The development of Internet services allows to a greater extent to involve customers in the process of innovation. The chosen models of open innovation are presented below, which in a different scope involve customers in the innovation processes.

More about directions of development open innovations see [Jelonek 2010] and [Mierzejewska 2008].

3. Value co-creation model

Value co-creation blurs currently distinctly marked borders between what constitutes interior and what is outside the organization treated as its environment. Value is co-created by the firm and the customer – rather than being entirely created within the firm [Prahalad, Ramaswamy 2004]. Over the last few years we can observe the changing role of the consumer. C.K. Prahalad and V. Ramaswamy agree the impact of this new consumer role is manifested in many ways [Prahalad, Ramaswamy 2003, pp. 2–5]:
– Information Access: With Access amounts of information, knowledgeable make more informed decisions.
– Global View: Consumers can also access information on firms, products, technologies, performance, prices and consumer actions and reactions from around the world.

– Networking: "Thematic consumer communities," in which individuals share ideas and feelings without regard for geographic or social barriers, are revolutionizing emerging markets and transforming established ones. The power of consumer communities comes from their independence from the firm. Thus, consumer networking inverts the traditional top-down patterns of marketing communications.

– Experimentation: Consumers can also use the Internet to experiment with and develop products, especially digital ones.

– Activism: As people learn, they can better discriminate when making choices; as they network, they embolden each other to act and speak out.

The consequence of the changing role of consumers is the use of interaction between the companies and consumer and consumer communities as a basis for value co-creation. Internet and virtual environment allow the creation of new interaction solutions. The key differences between customer engagement in physical and virtual environments are presented in Table 2.

Table 2. Key differences between customer engagement in physical and virtual environments

Innovation perspective	In physical environments Firm-centric	In virtual environments Customer-centric
Role of the customer	Passive – customer voice as an input to create and test products	Active – Customer as a partner in the innovation process
Direction of interaction	One-way	Two-way
Intensity of interaction	On contingent basis	Continuous, back and forth dialogue
Richness of interaction	Focus on individual knowledge	Focus on knowledge as social and collective sense making
Size and scope of audiences	Current customers	Current as well as prospects an potential customers

Source: [Sawhney, Verona, Prandelli 2005, p. 4; Rossi 2011, p. 48].

Human nature induces us to take up the group works and to gather around common interests. New communication solutions such as the Internet or the mobile networks facilitate taking up online jobs and forming community groups irrespective of geographical or social barriers. Developing co-creation of value concept might depend on cooperation with a community of consumers who share their remarks and sensations, they point the direction of changes and they propagate their ideas and concepts by means of Internet forums.

4. Experience innovation model

More and more often the customer's attitude is changed by the need for experimenting. The customer wants to be sure what they are buying, preferably even before purchasing

a product they would like to verify and test it. The impact of this factor on innovation is developed by C.K. Prahalad and V. Ramaswamy who write about the direction of creation experience innovation. According to the authors, new innovation practices should not be focused on the products and services but they should concentrate on experiments in the environment that are supported and initiated by networks of companies or customers' communities aimed at creating unique values for an individual client. The main aspects of migrating to co-creation experience are shown in Table 3.

Table 3. Migrating to co-creation experiences

	Traditional exchange	Co-creation experiences
Goal of interaction	Extraction of economic value	Co-creation of value through compelling co-creation experiences, as well as extraction of economic value
Locus of interaction	Once at the end of the value chain	Repeatedly, anywhere, and any time in the system
Company-customer relationship	Transaction based	Set of interactions and transactions focused on a series of co-creation experiences
View of choice	Variety of products and services, features and functionalities, product performance, and operating procedures	Co-creation experience based on interactions across multiple channels, options, transactions, and the price-experience relationship
Pattern of Interaction between firm and customer	Passive, firm-initiated, one-on-one	Active, initiated by either firm or customer, one-on-one or one-to-many
Focus of quality	Quality of internal processes and what companies have on offer	Quality of customer-company interactions and co-creation experiences

Source: [Prahalad, Ramaswamy 2004, p. 8].

Companies should view the market as a space for potential co-creation experiences in which individual constraints and choices define their willingness to pay for experiences.

5. User-driven innovation concept

More and more frequently, clients and users of the product and service are the innovation's co-authors. This fact found a reflection in a concept of innovation co-created by a user defined as *user-driven innovation* (UDI). This concept is a response to and a consequence of changes in consumers' behavior on the market. It is noticed that often consumers want to participate in a process of creating and developing ideas of new products and services that they would like to purchase or use in the future.

User-Driven Innovation is the process of tapping into users' knowledge in order to develop new products, services and concepts. A user-driven innovation process is based on an understanding of true user needs and a more systematic involvement of users [Wise, Hogenhaven 2008, p. 21]. The *user-driven* innovation process may focus exclusively on customer needs. J. Rosted distinguished the following steps in the user-driven innovation process [Rosted 2005, p. 33]:
1. Customer observations.
2. Design solutions, new concepts and develop prototypes.
3. Investigate production – capabilities and technological opportunities.
4. Assess market potential.
5. Design innovation strategy.
6. Implementation.

The first step in the process is to systematically map 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.

It may seem that the sixth stage closes the cycle, but a significant environmental changeability and variable customer's needs justify the return to the observation stage, constant monitoring of demand and customers' evaluation of product usefulness.

One of the most important benefits is a diversification of the offers on the market. What is more, the offered products and services meet customers' needs better. In response to clients' suggestions new products are more useful, have better quality and are more innovative.

6. Crowdsourcing

The etymology of the term crowdsourcing can be traced to a Wired magazine article where the term outsourcing was modified to describe the recruitment of a global online workforce without the need for a traditional outsourcing company [Howe 2006]. J. Howe indicated that crowdsourcing was limited to for-profit businesses leveraging the Internet workforce. On the basis of the current and emerging uses of crowdsourcing technologies, the following definitions have become too narrow and should be expanded to include other uses for leveraging an independent global workforce. Crowdsourcing is the intentional mobilization for commercial exploitation of creative ideas and other forms of work performed by consumers [Kleemann, Voß, Rieder 2008, p. 22].

Consumers are treated as an authoritarian source of knowledge that knows better which product will meet their expectations. One of the first companies that used crowdsourcing to improve their products and services was the Dell company. The service IdeaStorm.com allows all the users to place their ideas for improving Dell's products. The same users can review others' ideas and vote for the best ones. Dell has announced that their company used over 14 thousand ideas given by Internet users

and although the ideas were not used directly they became a source of innovation for Dell's specialists.

7. Internet services support open innovation

Through the evolution of the Internet with its services and social networks, the Internet has become a significant part of our daily life. Internet-based services are at the centre of society and the economy. They are changing the ways of doing business, interact, actively participate in social groups, use and share information resources. The development of internet-based services has a significant influence on the communication, relations and collaboration between companies. The following internet services influence the process of creation open innovation:

Discussion groups. They were initial steps in collaboration based on distributed resources in mails and shared articles similar to news bulletins

World Wide Web. WWW is a hypertext document system. The web pages had little functionality, but progressively a certain interactivity was introduced. After this stage, portals were introduced as integrated access to information on a certain topic.

Search engines: Google. Search engines modified the way users work and collaborate. Its terms and work alternatives and its collaboration relationship has contributed to breaking down a structured and rigid way of understanding directories, taxonomies and the classification of shared information.

Peer to peer (P2P). This service is used as thematic social networks. It is utilized to refer to collaboration networks in egalitarian terms and to denominate collaboration communities where something is shared.

Web 2.0. The objective of this new concept is to facilitate collaboration and sharing among users.

Rich site summary (RSS) and blogs. RSS is a family of web feed formats utilized to publish frequently updated digital content, such as blogs, news feeds or pod casts.

Wikis. The wiki is a type of website that allows anyone visiting the site to add or edit existing content and to collaborate electronically in an easy way for authoring.

Wikipedia. Collaborative encyclopaedia is the best known application of wiki.

Folksonomy. This is a user-generated taxonomy utilized to categorize and retrieve web content such as Web pages, photographs and Web links, using open--ended labels called "tags".

Models for scientific collaboration: Science Commons. It is usually formed by research teams composed of restricted groups of scientific researchers. It is a project that uses the philosophy and activities of Creative Commons in the field of science. One example is LIGO Scientific Collaboration (www.ligo.org).

Virtual communities. A virtual community, or online community, is a group of people who, initially or basically, communicate via the Internet, instead of face-to--face.

Second Life. Second Life is a 3-D virtual world entirely built and owned by its residents. In this world people from around the globe can meet, buy things (real and virtual), develop their own virtual business, learn, create experts groups. This is very useful platform for collaboration.

The way to the Semantic Web. It is an evolving extension of the WWW in which web content is understood by computers, so that they can perform more of the tedium involved in finding, sharing and combining information on the web.

8. Conclusions

Innovation in today's market may take many forms from internal innovation requiring collaboration between departments within a company to open innovation, which allows companies to share expertise. Choosing an open innovation model in the creation of innovations implies a situation in which employees must actively participate in the process, and they must be aware of how important they are in a process of communication between the inside of a company and its environment.

The concepts involving customers' innovation process are especially promising. This direction is noticeable in the concept of *value co-creation* with the customers co-operation, in the concept of *experience innovation* whose source are the clients' experiences (experiments), in the concept of user-driven innovation – leadership of the customer, that fully transfers the initiative and supervision of creating innovation on customers, and finally in the concept of crowdsourcing.

Dialog is an important element in the open innovations co-creation process. Internet and internet services caused that the markets can be viewed as a set of conversations between customers and customers community and companies.

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ROLA INTERNETU
W ROZWOJU MODELI INNOWACJI OTWARTYCH

Streszczenie: Artykuł analizuje nowe modele innowacji otwartych: model *value co-creation*, *co-creation experience innovation*, model *user-driven innovation* i koncepcję *crowdsourcing*. Zostały przedstawione wybrane usługi sieci Internet, które wspierają komunikację i współpracę pomiędzy przedsiębiorstwami i konsumentami oraz społecznościami konsumentów.

Słowa kluczowe: model innowacji otwartych, model współtworzenia wartości, model współtworzenia innowacji na bazie doświadczeń, model *user-driven innovation*, *crowdsourcing*, Internet.