

Innovative models for generating ideas in a high-tech environment

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Abstract

In our rapidly changing world businesses and societies are faced with new challenges and opportunities. Innovations help companies develop continuously, adapt to changes in market conditions and initiate such changes themselves.

The new wave of technologies leads to the emergence of open innovations. These are a prerequisite for a change in the interaction between companies and consumers where cooperation is the new source of innovation. Interactive communication allows businesses to learn much faster the opinion of their customers, to encourage their cooperation and to provoke them to generate new ideas. This helps in responding appropriately both to changing market conditions and to crisis situations.

This paper focuses on innovative models for generating ideas for new products. These models are the result of the development of modern society and the achievements in the field of technology. The approach of using platforms to develop products and ideas is an important success factor in many markets. Thanks to this approach companies are able to create new and differentiated products more effectively thus meeting the needs and expectations of consumers. The present article is funded under Project №182/2016.

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1. Introduction

Technological development leads to large-scale dissemination of information, ideas and public opinion; the ways to create products, services and new business models are constantly improving. Innovations are becoming a crucial part of the development of companies, which in turn seek to analyze consumer preferences and technology trends (Solis, 2016). The modern economy is gradually transforming itself from an industrial based economy to one based on knowledge and information. Digital economy (Accenture, 2016a) is in rapid development, accounting for 22 percent of the global economy in 2015, compared to the 15 percent in 2005. The forecasts are that this trend will persist and the digital economy's share will reach 25 percent by 2020. It should be noted that the success of technology depends on people. This is one of the main reasons for studying and analyzing in detail the behavior and needs of customers, in order to create and develop products for which there exists demand.

A decisive factor in the era of knowledge is the ability of companies to develop their corporate culture, not only to apply and use correctly new technologies, but also to adopt the concepts of new business strategies brought by these technologies. Along with this, the Internet changes the manner and the means by which businesses carry out their marketing activities, such as market research, market segmentation, identifying target markets, positioning, increasing the level of customer satisfaction, promotion and marketing of the product. The concept of electronic marketing (Chaffey, 2009) has come to life, which can be defined as achieving marketing goals by applying digital technologies. Electronic marketing creates different forms of communication between businesses and consumers, resulting in the emergence of models that stimulate product innovation in a new way.

At the core of any innovation are ideas. An idea may be defined as a utility or a benefit obtained through a suitable form or technology. New products, technologies and combinations of

different sets of desirable benefits can be generated from different sources. Sources that generate ideas are different in nature and there are many classifications describing them. This paper examines the basic division into internal and external sources of ideas.

The main sources of innovation ideas within companies are the R&D departments, the people dealing with marketing and sales, and the workers directly involved in production activities. The traditional R&D departments are of primary importance in generating ideas for new products, in beneficial and effective cooperation with the remaining potential sources of innovation (Baldwin, Hanel, 2003).

Most companies use as their main source of innovative ideas the collective creativity of the employees, by creating opportunities for internal innovation (Terwiesch, Ulrich, 2009). The generation of new ideas by employees in the company needs to be managed. This means setting goals to collect a certain number of proposals for new products during a certain period, and announcing the number of ideas realized, in order to sustain the interest of company employees. Gathering lots of new ideas depends on the existence of an innovation-friendly environment in the company. This is one of the reasons why the new systems include processes providing opportunity to engage more people in the process of collaboration (Bergendahl, Magnusson, 2015). These new approaches allow employees to generate ideas while communicating with each other within networking systems (Schulze, Hoegl, 2008; Björk, Magnusson, 2009).

Recent highlights in the development of the open innovation concept (Chesbrough, 2005) concern the potential of sources of ideas external to the organization, which can provide information to be used in the employees' creative process. Open innovations (Open Innovation Community, 2016) use targeted inflows and outflows of knowledge to accelerate internal innovation process. This paradigm assumes that companies can and should use a combination of internal and external sources of ideas in their innovation policy. Companies can commercialize their internal ideas and generate value for the organization. The literature in the field of ideas generation points out the major advantages and benefits of socialization and the use of employees (see, e.g., Schulze, Hoegl, 2008) to generate ideas together with the external actors.

External sources of ideas may include sources from the scientific field, the technological sphere and the market. Contacts with universities are one of the possible sources of ideas for new products or services coming from the scientific field. Scientific developments often have business potential, which is one reason why many companies practice various forms of cooperation with universities. The sources within the technological sphere include inventors, professionals in various fields of engineering and technology, personnel in research and development departments. The main sources coming from the market are the current and future consumers and customers of the company who exercise the greatest influence on innovation, both in mass consumption products and industrial products. This is why the management of the innovation process includes great attention to research of consumer needs. In some cases, consumers themselves are the initiators of innovation. Identifying customer needs is essential in the development of successful product innovations. Customers can provide valuable information related to the marketing of products. It is necessary to integrate the activities of R&D and Marketing departments, in order to avoid the risk of developing products for which there is little or no demand (Hill, Jones, 2009).

Many companies today are oriented towards the development of active approaches to generating and developing new innovative ideas, which in recent years include the formation of concepts (see, e.g., Björk, Boccardelli, Magnusson, 2010). Companies develop new systems and processes to maintain and manage active creative initiatives and encourage a continuous stream of new and valuable ideas that can be turned into innovations (Bergendahl, Magnusson, 2015).

The Internet allows increased collaboration in the generation of ideas (Brabham, 2011, Corrocher, 2011). Companies have the opportunity to improve their innovation processes by using instruments available on the Internet, on whose basis open innovation web-based platforms (OIPs) are built. Open innovation web-based platforms are a new instrument for the aggregation and integration of various participants (consumers and businesses) in an innovation community (Battistella, Nonino, 2012). This is a general term used to describe open source software based platforms for various forms of cooperation (Bonaccorsi, Rossi, 2004; Hars, Ou, 2002).

These new approaches are based on information technologies and use IT-based systems that enable more effective and efficient management of ideas (Sandström, Björk, 2010). A key feature of many of these systems is that they use digital communication to improve opportunities for collaboration in the innovation processes.

The business model (Accenture, 2016b) of using these IT platforms opens up new avenues for company growth. This technology-driven business model is based on platforms that create value. The main advantages of using this model include:

- Network effect/ bilateral market - created when two groups of actors (typically manufacturers and consumers) generate a network of value for each other. This includes exchange and cooperation stimulating demand and allowing economies of scale.

- Natural distribution of strengths - refers to platforms providing scale, allowing others to generate profits by avoiding diminishing returns characteristic of the traditional (linear) model of value in the supply chain.

- Asymmetric growth and competition – based on the fluctuation of demand, it refers to complementary markets, which are often subsidized or free for consumers. Asymmetric competition exists when two companies face different market opportunities with very different approaches and means.

It has been suggested that although leading companies from all industries know that business in our interconnected world has become too complex to afford complacency, the issues are particularly clear in the information technology industry. It should be pointed out that there, platform leaders (companies that drive industrywide innovation for an evolving system of separately developed pieces of technology) are navigating more frequent challenges from wannabes (companies that want to be platform leaders) and complementors (companies that make ancillary products that expand the platform's market). Thus, the information shows that to put their organizations in the best competitive position, managers need to master two tricks; coordinating internal units that play one or more of those roles and interacting effectively with outsiders playing those roles (Cusumano, Gawer, 2002).

In conclusion it can be stated that platform leaders need to have a vision that extends beyond their current business operations and the technical specifications of one product or one component. The ecosystem can be greater than the sum of its parts if companies follow a leader and create new futures together. On the other hand complementors need to understand the vision of the platform leader in their industry and make some bets on what that vision means for their own future. But it is the platform leaders, with the decisions they make, that have the most influence over the degree and kind of innovations that complementary producers create. Platform leadership and complementary innovation by outside companies are not things that happen spontaneously in an industry. Managers with vision make them happen (Cusumano, Gawer, 2002).

2. Analysis of platforms for innovative ideas generation

In recent years, more and more companies have realized the potential of using their employees, customers, partners and stakeholders as a source of information to be used for innovation. Open

innovation platforms are instruments used by companies to accelerate the innovation process. On these platforms different groups of stakeholders have the opportunity to collaborate with companies through suggestions and ideas for new products, and new concepts and trends meeting the needs of organizations (Battistell, Nonino, 2012).

Open innovation platforms are aimed at improving innovation activity in terms of creating new products and services by making the good ideas a reality. In essence, these platforms are software products that can be integrated in the various business systems used by companies, or function independently as part of the general corporate system of companies. The platforms make use of the achievements of technology and are an intelligent tool for interactive communication between various sources of innovative ideas.

Idea generation models in the digital space are rapidly developing in current market conditions. A number of examples of models in the different categories can be named. This paper focuses specifically on successful examples of platforms for generation of ideas by employees and customers. An analysis of two groups of innovation platforms has been made, where the differentiation criterion is the type of source of ideas. Models are basically divided into the two groups listed in Figure 1.

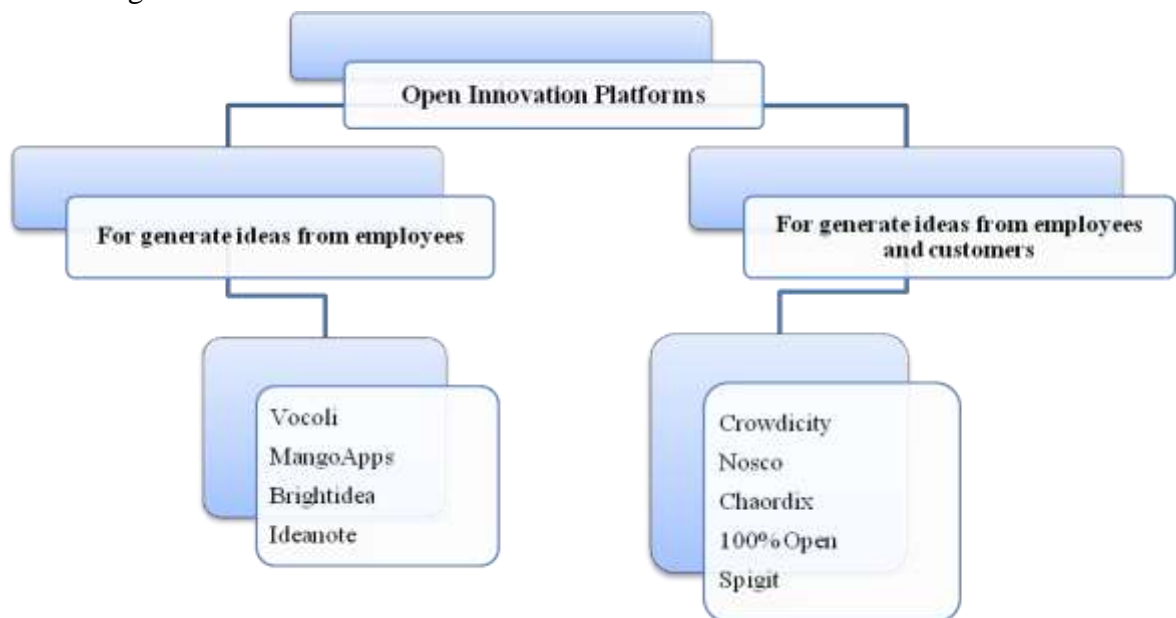


Figure 1. Classification of the Open Innovation Platforms

3. Platforms for ideas generation by employees

The first group includes platforms that are used to generate ideas by employees within the internal organizational structure of companies. In recent years one of the most discussed trends in human resources has involved the results of a study by Gallup on the American workplace, showing that only 13% of all employees (worldwide) are committed to their work. This is because most people prefer to gain greater satisfaction from their work along with their salary (Gallup, 2013).

The analysis of models for generating ideas by employees examines the underlying characteristics and concepts. The main principles of each of the models studied have been outlined, and a comparative analysis of their components has been made (see Table 1).

The Vocoli platform is built on the principle of organizing the process of generating and developing ideas aimed at engaging the employees (Vocoli, 2016). The platform integrates into different business systems. The purpose of the platform is a better internal communication in organizations. Vocoli is a flexible platform for support of initiatives and continuous improvement of business processes. It offers different modules that include a wide range of innovation stimulating elements. The platform provides detailed analyses and reports which can be used by companies to identify problem areas in their operations and move in the direction of their innovative development.

The next model, MangoApps, is a platform that integrates the tasks of employees in order to optimize their workflows (MangoApps, 2016). MangoApps Team Collaboration has the following features:

- Project work follow-up from start to finish and task management, where responsibilities are clearly allocated
- Secure file sharing within the system
- Opportunity for employees to ask questions, share ideas and vote for them
- Enhancing employee engagement in the organization using an integrated module
- Collaboration anytime and anywhere through mobile applications

MangoApps has implemented an employee recognition system within the organizational communication flow. This enhances the motivation to participate in the platform.

Brightidea is a platform that allows managing everything in one place, from engaging employees in the innovation activities of the company to monitoring the effectiveness of internal business processes. Brightidea is characterized by flexibility and possibility for individual configuration depending on the individual decisions of various companies (Brightidea, 2016).

Ideanote is an easy to use platform for collecting, sorting and selecting ideas within the company (Ideanote, 2016). Users, who in this case are employees, can follow the ideas shared, evaluate them and easily get feedback in the process of innovation. When users contribute with ideas, these are rated by award of points. Ideas with the highest rating will potentially be developed. Ideanote is a platform optimized for all devices and browsers, which makes it very flexible.

Table 1. Basic elements of the Open Innovation Platforms for ideas generation by employees

Basic elements of the platform	Open Innovation Platform			
	Vocoli	MangoApps	Brightidea	Ideanote
Cloud	✓	✓	✓	✓
Idea submission to launch	✓	✓	✓	✓
Share ideas	✓	✓	✓	✓
Groups	✓	✓	✓	✓
Rich Employee Profiles	X	✓	X	X
Employee Blog Posts	✓	✓	X	X
Question & Answers	✓	✓	✓	✓
Enterprise Social Network	✓	✓	✓	✓
Idea Campaign Management	✓	✓	X	X
Gamification	✓	✓	✓	✓
Recognition	✓	✓	✓	✓
File Sharing	✓	✓	✓	✓
Analysis and Reporting	✓	✓	✓	✓
Enterprise Social Network	✓	✓	✓	✓
Integrations with Business Systems	✓	✓	✓	✓
Mobile	✓	✓	✓	✓

As a result of the analysis of platforms for generating ideas from employees, the following principles can be derived:

- provide a place where employees can share their ideas
- promote the process of generating ideas from employees for the purpose of collaboration
- enable employees to become part of the innovative development of the company

The first principle is the foundation on which the concepts of the examined platforms are built. The aim here is collaboration. Employees need to understand how their ideas can contribute to the success of the organization. This means that must to believe in their common goal and values, but also receive support from their managers when working on new ideas that have potential for development. The second basic principle is based on motivation. Employees' engagement must be motivated through awards and recognition. This should be voluntary, without pressure from management. Transparency and honesty are the key to creating a culture of innovation. Employees must be confident that they can share their knowledge and ideas in a constructive communication with their managers. Using collaborative platforms is a useful tool to generate ideas that would otherwise go unnoticed.

There are certain differences between the platforms in terms of functionality, which is due to the use of different component modules. Using campaigns to encourage the development of an idea strengthens the processes of collaboration.

The joint efforts of management and employees help shorten the time to explore an idea and proceed with its next stage development by experts. This creates a single network of communicative cooperation between employees, managers and executives, which improves productivity across the organization. This is a most favourable environment which allows ideas to become reality.

4. Platforms for ideas generation by employees and consumers

The second group of platforms aims at generating ideas by consumers in conjunction with the company's employees. These platforms are based on the collaboration between the organization's internal sources of product innovation, involving consumers to this process. Organizations today are able to adopt various approaches to interactive communication with consumers. Creative thinking allows the generation of new ideas or taking innovative approaches to certain issues. The stimulation of human creativity leads to a desire for self-realization and free sharing of thoughts and ideas. The above platforms provide free access to organizations and consumers. They can observe the operations or get involved as participants by submitting, posting, sharing and evaluating ideas. Opportunity is provided for contact with different audiences and implementation of joint activities: project development, participation in creative teams, and realization of socially useful ideas.

The first example of a successful practice in this field to be reviewed is Crowdicity (Crowdicity, 2015). This is software for intelligent organizations managing the idea generation processes from both internal sources and sources outside the organization. It integrates the joint efforts and forms of collaboration between employees, partners and customers, whose experience can help organizations towards greater efficiency and efficacy of open innovations. Crowdicity is based on the concept of cooperation and sharing. This is done through interactive communication. Consumers can submit ideas supported by images, documents or videos. Ideas can be discussed in two ways: in universal cooperation with the entire community, or just within a specific group or team. The platform uses an evaluation system in the form of voting. Consumers cannot vote for their own ideas and they can vote only once for a given idea. The system also monitors and prevents unauthorized voting and commenting.

Nosco is a social platform for ideas. Similar to the models reviewed hitherto, it is based on sharing of ideas, commenting and voting for ideas that appeal. Social innovations are implemented through increased collaboration, communication and knowledge sharing. Nosco allows administrators to easily allocate workflows. The platform utilizes a full set of indicators based on real data, for analysis in real time. Nosco allows the effective management of thousands of people and ideas. The platform falls into the category combining internal and external sources of ideas (Nosco, 2016).

The open innovation platform Chaordix provides various opportunities for cooperation. Participants are granted access to a dynamic flow of information, enabling them to track the operations and activity within the community (Chaordix, 2016).

The next platform under review, 100% Open, is designed to be used as a toolkit for developing successful open innovations. It includes a strategy for cooperation and building successful business models and strong partnerships. Using 100% Open improves communication between different groups of employees and customer communities (The 100% Open Innovation Toolkit, 2014).

The Spigit model engages the internal and external audiences of a company, who have an interest in its activities and are sources of innovation (Spigit, 2016). Spigit is crowdsourcing software used to develop the innovation process, generate revolutionary ideas, reduce costs and involve employees, partners and customers in common innovation initiatives. The Spigit platform uses sophisticated analyses and algorithms that help to identify the best ideas. Through the joint efforts of different audiences companies collect outstanding ideas, some of which can be marketed successfully, and thus improve the performance of organizations. This in turn improves the competitive advantages of an organization.

Table 2. Basic element of the Open Innovation Platforms for generate ideas from employees and customers

Basic elements of the platform	Open Innovation Platform				
	Crowdcity	Nosco	Chaordix	100% Open	Spigit
Cloud	✓	X	X	X	X
Idea submission to launch	✓	✓	✓	✓	✓
Share ideas	✓	✓	✓	✓	✓
Groups	✓	✓	✓	✓	✓
Collaboration between employees and customers	✓	✓	✓	✓	✓
Enterprise Social Network	✓	✓	✓	✓	✓
Idea storms	✓	✓	✓	X	X
Evaluate ideas	✓	✓	✓	✓	✓
File Sharing	✓	✓	✓	✓	✓
Analysis and Reporting	✓	✓	✓	✓	✓
Enterprise Social Network	✓	✓	✓	✓	✓
Idea Campaign Management	✓	✓	X	X	✓
Integrations with Business Systems	✓	✓	✓	✓	✓
Mobile	✓	✓	✓	✓	✓

The basic elements of the platforms reviewed are listed in Table 2. In summary it can be concluded that the second group of models build on the concept of collaboration involving consumers in the process. Thus, companies can generate ideas for their products and services

directly from their customers and incite customers to take interest in the business operations. The idea generation platforms of the second group offer companies:

- integrated collaboration between employees and consumers within the innovation policy of the company
- implementation of an established structure of modules which cover the entire cycle of idea generation: posting, sharing, comments, realization.
- an established method of voting for ideas
- module for preparation of analyses
- Access to platforms anytime and from anywhere

It should be pointed out that as a channel for realization of ideas the platforms have the potential for further development. They are implemented successfully in different fields and are characterized by increasingly strong and stable positions in terms of consumer use. The platforms are distinguished by their ability to provoke the interest of consumers and make them partial to what is happening in them. The dissemination and implementation of good ideas requires a wide audience where they can be heard and understood. In this regard, given the advantages of the idea generation platforms, it is appropriate to use them also as a channel to generate ideas for the benefit of society.

Some authors offer an innovative approach to communication also at the regional level, through platforms where citizens can get involved in the process of generating, classifying and evaluating ideas that could contribute to the future development of a region. According to these authors the advantages of implementing such platforms are the following: possibility of active expression of opinion; generation of a wide variety of ideas; possibility to select ideas with a lower realization cost; participation of people of different ethnic backgrounds; employing the potential of students and teachers in the region; active participation of people in the realization of their own ideas; activation of the snowball effect in communication; possibility to archive the information used in the management of the region; and creating an interactive space for discussion between local authorities and citizens (Tonkova, 2015).

This analysis of platforms for generation of innovative ideas rests on research observations based on secondary information. The results derived can be used as a basis for additional marketing research employing marketing tools aimed at specifically targeted business organizations that make use of the various forms of idea gathering for their business operations. This would complement the present study with relevant primary data allowing a further development of the analysis and providing additional information about the studied models.

Conclusion

Contemporary companies have large possibilities to act on a global scale thanks to the Internet and the development of new digital technologies. The high-tech conceptual models examined above support the operations of businesses and create a favourable environment for development. They can be used as a foundation on which new models for improving the idea exchange processes can be created. Development of new innovative products is essential for most companies, in terms of maintaining a competitive advantage and a future revenue growth. Fresh ideas often mean that the products and services of a company will stand out on the market. Important for the development of innovations are the accumulation of knowledge and the development of creatively thinking human resources with new skills to transfer knowledge through technology and easier access to content.

The sharing of ideas and data in real time, accomplished with the help of the platforms reviewed in this paper, allows consumers to take advantage of social and business networks of employees, partners, suppliers and all stakeholders for the purpose of sharing and finding the

right ideas at the right time. The new idea generation platforms used by a company are aimed at stimulating creativity and innovation both internally within the company teams, and externally, among consumers.

All this in turn leads to changes in economic development; however, attention should be paid to both the positive contributions and the threats that lie in the introduction of innovations such as platforms for sharing ideas, products, services, and for joint use and management of value chains in an electronic format.

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