Managing New Sources of Innovation

von

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Companies have witnessed an increasing variety of options to generate innovations over the last few years. Such options include company internal as well as company external sources of innovation. While traditional models of industry development and product life cycle have focused a lot on established manufacturers and companies as being active innovators, innovations also originate with the users of products or services. Research over the last years has shown that they are a powerful source of innovation, facilitated by new methods of communication and exchange of information.

Manufacturer Active Paradigm

In the more traditional view of innovation management ("manufacturer active paradigm"), companies use their R&D departments to generate ideas and follow their development until the products or services finally reach the market. This usually includes a number of stages and gates (as published in the well-know stage-gate models by Cooper). Typical stages in such models include the scoping of ideas, building of a business case, development, testing and valuation and finally the launch of the new product.

Note that the customer or user will (if at all) be included only in very late stages of the new product development process. High failure rates for standard products (only 2% of all ideas survive the development process, 35% of all products that reach the market turn out to be a flop, flop rates can come as high as 90%, etc., Crawford, 1979; Cooper, 1999) show that the process of new product development is far from being efficient.

User Active Paradigm

New methods and tools enable the integration of innovative users into new product development of established companies at much earlier stages. According to the "user active paradigm", users of products or services will show plenty of innovative activities in all sorts of industries. Sometimes they will get innovative because of special needs or likes that are not met by standard products from established companies. Sometimes users will simply get innovative because they like the process of creation and creativity and are able to exchange their ideas with other innovative individuals.

While the "user active paradigm" seems to be a promising framework for companies to generate new ideas, not too many have so far started to make use of this innovative potential. Where are the problems and why are companies still reluctant to think about new ways of product development?

Problems with the generation of ideas

Starting at the input side of a typical new product development process, the generation of ideas, one problem is the high number of innovative individuals and the vast number of potential business ideas available. New forms of electronic communication have enabled users to interact and innovate without (noteworthy) fixed costs. In diverse communities, users discuss existing products or services, change products or services they do not like or innovate completely from scratch. To name just one example of a very prominent electronic community: on the open source software community web site "sourceforge.net", 1,441,897 users work on 135,060 projects in parallel!

Another hindering factor for companies to take over innovations from users is the fast development of new versions or designs of innovations. While end users do

not have large fixed costs, companies always have to bear the net present value of their investments in mind. As long as the innovation rate is too high, meaning that too many innovations will appear within a short time frame, established companies tend to stay risk avers and wait to see "what happens". By doing that, they really can avoid the risk of investing in a bad version of an innovation but they can also simply lose sight of what is going on in a certain market. Clayton Christensen from Harvard Business School has called that effect the innovator's dilemma. He claims that history has often shown the downturn of successful, big companies because of the innovative activities of small entrants that come up with totally new solutions for existing customer segments and new market segments out of non-consumers.

Considering the process and output side of the new product development process, there are a number of other effects that hinder the transfer of innovations from the user innovators to the companies. One communication aspect is the effect of tacit knowledge. Much of the knowledge that is obvious to a person or company in an implicit way might be very hard to transfer. Just think of how to describe to ride a bike or how to drive a car. We all know how to do that but it would take hundreds of pages of detailed descriptions to exactly name all the actions that have to be taken to derive at the desired effect. We call that information to be "sticky" because it sticks to the locus of innovation, the innovator.

And finally, companies are usually not eager to take over innovations from external sources. Some of that behavior is reasonably founded but to a large part of it, some companies simply have a "not invented here" syndrome, meaning that they will never accept superiority of external solutions for their problems.

Sources of Innovation: Lead Users

How can companies make use of the innovative potential from new sources of innovation in spite of all the problems named? Prof. Eric von Hippel from MIT (Massachusetts Institute of Technology) Sloan School of Management has found a proper solution to integrate user innovators and their ideas. In his two books, the "Sources of Innovation" and "Democratizing Innovation" (both books can be downloaded for free at http://web.mit.edu/evhippel/www/) he describes how innovative and successful innovators, called "lead users" can be identified and integrated into new product development processes of companies.

Lead users share two characteristics that make them very interesting for companies who want to develop radical innovations. First, lead users have a high benefit from innovations in their fields. Therefore, they often start innovative activities themselves. Second, lead users are ahead of market trends, meaning that they can anticipate needs that other users and customers will only face in future. The combination of those two characteristics is important: Innovations derived from lead users will be radically new and attractive to the market resulting in increased market shares for the companies willing to develop them. A study of Lilien et al (2002) reveals that ideas generated by lead users have a sales potential that is more than eight times higher than the ones generated by non-lead users.

Methods of Identifying Lead Users

How can companies find and integrate lead users? Usually a lead user project starts with the definition of a search field or problem field. The company has to define a certain area in which it aims for radical innovations. Based on this search field, relevant needs and trends are identified using a mix of different search methods like experts´ interviews or secondary data research. Usually the trend search will result in several trends that are important

for the prevailing search field. In a next step, the company has to decide on which trends to follow as the trends represent the roads on which those innovative users can be found and following more than a handful of roads will result in an inefficient search process for lead users. Based on the trends lead users can be found in the target market (the market in which the company has its field of operation) but also in "analogous" markets (markets that might be different in their appearance but where companies or individuals face the same trend, sometimes in a more extreme form). Lead Users can be identified by several different search methods: screening, pyramiding or broadcasting.

While screening means to search and analyze the total number of individuals or objects in a given population for lead user characteristics, pyramiding is a step by step approach, starting to interviewing persons and asking for further interview partners who can help to identify the right person (the lead user). This process of referrals will come to an end when the top of the pyramid is reached. It also might result into referrals to analogous markets as leading edge companies or individuals tend to know people from outside their markets because of their advanced position or leading edge needs. Broadcasting means to ask tricky questions concerning the prevailing problem or search field in online forums or communities. It can be done in parallel in many different locations and is likely to result in innovative ideas and the people behind those ideas.

Finally, this search processes will result in a group of lead users. Those people will then be invited to a lead user workshop where they discuss their ideas with people from the company and develop concepts for radical innovations. A lead user workshop usually takes two to three days and will result in a number of well defined innovative concepts.

Toolkits

What other tools or sources can be used to integrate innovative users? As mentioned above, innovative users can be found in online communities, where they share their experiences and knowledge. Companies interested in finding innovative ideas and people can screen such communities and actively participate in the discussions. Moreover, companies can set up their own communities for their customers and users or design the so-called toolkits for user innovation and design.

What are toolkits? We all know very simple forms of toolkits that are used in mass customization: configurators. Customers can, for instance, choose the design of their cars or their t-shirts or bags, to name just a few. Configurators are simple toolkits and offer a restricted choice of adaptation for customers. Expert toolkits go one step further: they give the user or customer the freedom to innovate on their own, supported by a design space supplied by the manufacturer. Examples for such expert toolkits are toolkits used for industrial flavors or scents, toolkits for ASICs (Application Specific Integrated Circuit computer chips) where customers can build their own connections and circuit elements on a given silicon weaver supplied by the manufacturer or simply the design of completely new sport shoes (like Nike id). In contrast to the lead user idea-generation process which is an active integration of lead users that has to be organized for a specific search field or topic, toolkits and the use of communities enable users to be innovative whenever they want but without a predicted outcome.

Conclusions

Summarizing new sources of innovation it must be clear that the outcome of innovative user activities target early stages in the new product development process: innovative ideas, concepts or prototypes. From that stage on the

company has to provide further processes or development internally. Thus, new sources of innovation offer an alternative to traditional, internal R&D efforts and end before traditional models of new product development start. However, it has been shown that innovative concepts from lead users can result in more radical solutions that will lead to products with a much higher market potential. Eventually, it will depend on the company strategy if such new sources of innovation are attractive and if radically new products are really wanted.

For more information, go to:

http://web.mit.edu/evhippel/www/

http://www.e-and-i.org and http://www.vienna-user-innovation-research-initiative.at

http://userinnovation.mit.edu

http://www.mass-customization.de

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