User characteristics for customer involvement in innovation processes: deconstructing the Lead User-concept

Dimitri Schuurman*

Ghent University, MICT – IBBT, Korte Meer 7-9-11, 9000 Gent, Belgium.
E-mail: Dimitri.Schuurman@ugent.be

Dominik Mahr

Maastricht University, School of Business and Economics, Tongersestraat 53, 6200 MD Maastricht, The Netherlands.
E-mail: D.Mahr@maastrichtuniversity.nl

Lieven De Marez

Ghent University, MICT – IBBT, Korte Meer 7-9-11, 9000 Gent, Belgium.
E-mail: Lieven.DeMarez@ugent.be

* Corresponding author

Abstract: Despite the growing evidence of the beneficial nature of customer and user involvement in new product or service development, research into user types and customer characteristics for innovation is still scarce. One notable exception can be found in the literature dealing with the so-called Lead User. Although there is a substantial research corpus dealing with Lead User innovation, the integration of Lead Users or Lead User-methods is definitely not common within most firms. We believe that disentangling the Lead User-concept into more concrete user types and customer characteristics would benefit and optimize user involvement in innovation processes. Within this paper, we describe six user types based on five dimensions, associated with the Lead User-concept and abstracted from various literature streams. We further propose some guidelines for an optimal integration of these users within innovation methodologies and sketch out some lines for future research.

Keywords: lead users, user-centric innovation, user characteristics, customer characteristics, customer involvement.

1   Introduction

New product or service development remains an important activity of firms in order to remain competitive. However, failure rates of innovations coming to the market remain high. Therefore, over the years a lot of research has been devoted to the New Product Development (NPD)-process, and especially on the techniques to develop new product or

service concepts. The idea that the customer or user should play an important role within these methods has spread among innovation scholars and as well as practitioners and is been taken for granted more and more. However, until recently little research has been devoted to 'which' customers or users to involve in NPD-processes, with the notable exception of the already long standing claim that the so-called Lead Users should be involved. The Lead User approach has earned its merits, but mostly in a B-to-B setting, the context in which von Hippel originally came up with this concept. Further anecdotal evidence of successful applications of Lead Users is situated within domains where users have extreme needs and high motivation to solve these needs, such as extreme sports. However, in the context of more common consumer goods or services, the Lead User-concept has proven less clear and effective. Other studies have begun to explore the employment of other types of users in order to optimize the innovation process, such as early adopters, ordinary users, Power users, buyers, defectors or emergent consumers (Duverger & Hassan 2008, Magnusson 2009, Hoffman et al. 2010, Schuurman et al. 2010). Some attempts at integrating customer characteristics into different categories have been made such as the framework of Piller & Ihl (2009) with competences for customers for open innovation, but overall their conceptualization overlaps and remains fuzzy.

Shortly, the employment of users in innovation processes is subject to a lot of debate and has been studied within various research streams and from different angles. This has caused a lot of misunderstanding in terms of conceptualization and terminologies. A clearer delineation would offer foundations for further research and managerial recommendations for the customer selection during the innovation process. This paper will look deeper into the problem of how to involve users and customers in innovation, and especially what types of users to involve, by means of a meta-analysis of research findings. Starting from the Lead User-concept and looking for other customer and user types associated with innovation, a typology of six customer types will be developed based on six relevant user characteristic dimensions.

2 Lead Users

The most known concept in the context of user involvement in innovation is the Lead User-concept, conceived already back in the seventies by von Hippel (see e.g. 1976, 1986). Lead Users display two main characteristics: they face specific needs months or years before they will be general in the marketplace and they expect to benefit significantly by obtaining a solution to these needs. These users can be from the leading edge of the target market or from markets facing similar problems but in more extreme forms (e.g. brakes in aircraft industry versus brakes in the automobile industry). This finding already highlights a first possible problem associated with the Lead User-concept. What Lead Users should a company look for, leading edge users or customers within their target market, or users from other markets, which are likely to be non-users/customers within the companies' own target market, or a mix of both 'Lead User-types', as in the widely-cited 3M-case (von Hippel et al., 1999).

Lead Users are related to the concept of 'sticky information', which implies that user needs can be latent and thus hard to transfer to the manufacturer (von Hippel, 2005). When looking to the 'locus of innovation', or the initiator of the innovation process, users will tend to develop innovations that draw heavily on their own information between

need and context of use, while manufacturers will tend to develop innovations that draw heavily on the types of solution information in which they specialize. When a company succeeds in integrating Lead Users into their innovation processes, they can possibly overcome this information stickiness and solve their own functional fixedness. However, this means that a Lead User should be an innovator and initiator of the innovation process, which narrows down the possible Lead Users as within the above reasoning, information stickiness can only be overcome through the act of innovating by the Lead User. As was demonstrated within Lead User-research, user innovation is quite common in some product domains (e.g. extreme sports, see e.g. Lüthje, 2003), but this is not always the case.

When user innovation is scarce or not easily detectable, Lead Users should be somehow involved within the innovation process in order to capture their advanced needs. Within Lead User-literature, this has resulted in some attempts to outline a 'Lead User-method' (von Hippel, 1986; Urban & von Hippel, 1988; Lilien et al., 2002). This Lead User-method for determining new product innovations has been successfully demonstrated in companies such as 3M (von Hippel et al., 1999), Hilti (Herstatt & von Hippel, 1992) and National Instruments (Seybold, 2006). However, an important issue is not clearly resolved: the identification-phase, or how to get the 'right' Lead Users. Different methods have been proposed, such as pyramiding (Lilien et al., 2002), netnography (Belz & Baumbach, 2010) and screening (Urban & von Hippel, 1988, Bilgram et al., 2008).

A final issue deals with the nature of the Lead Users themselves. Originally, the Lead User-concept was conceived in a B-to-B setting (von Hippel, 1976), but later the employment of Lead Users in B-to-C settings was also successfully demonstrated (see e.g. von Hippel et al., 1999; Herstatt & von Hippel, 1992; Seybold, 2006). Although a lot of these successes are quite anecdotal and are not to be found in a lot of different product categories, within a lot of literature the distinction between a business and a consumer setting is not clearly delineated. This conceptual ambiguity has already been noted by some authors (see e.g. Schuurman & De Marez, 2009).

However, we feel that all the aforementioned arguments only add up to this conceptual unclearness, and that a clear cut methodology for involving Lead Users within innovation processes remains absent. Although the Lead User-concept in se is extremely valuable and several authors have shown that they can be important contributors to successful innovations (Rothwell, 1992; von Hippel, 1986; Voss, 1985), we believe that a deconstruction of the Lead User-concept into more workable and manageable user and customer types would allow a more precise selection of users and customers for innovation. This line of reasoning is in line with Piller & Ihl (2009) who argue that the Lead User-concept has dominated the perspective of the earlier research on user innovation, but plead for a more collaborative mode of user participation, which they call 'design by customers' or open innovation with customers. In the next paragraph, we will look into the literature dealing with customer and user characteristics for innovation.

3 Customer Characteristics for Innovation

Literature regarding customer input for innovation originally made a distinction between incremental innovation and breakthrough innovation. Some research has demonstrated that customer input in the early phases of the innovation process can

provide valuable information in the case of incremental innovation (cf. Foxall, 1989; Gruner & Homburg, 2000; Cooper et al., 2002; Kristensson et al., 2004). Developing further on this line of thinking, it was believed that for radical innovation, only Lead Users could provide adequate user input to successful innovations (Rothwell, 1992; von Hippel, 1986; Voss, 1985).

As already noted in the previous paragraph, empirical research has showed that the involvement of Lead Users produces commercially more successful products (Morrison et al. 2004, von Hippel 2005). The ability of Lead Users to be such effective contributors to the innovation process has been ascribed to two major characteristics: adequate technological expertise and superior knowledge of the user domain 'use experience' (Lüthje, 2003). Recently, there has been a renewed discussion whether these characteristics might also constrain the innovative capacities of the users because they would inhibit divergent and truly novel thinking. Within this line of reasoning, Magnusson (2009) showed that ordinary users can also contribute in ideation phases of innovation processes, but not restricted to incremental innovation as was the case before.

Lettl (2007) also drops the Lead User-concept but argues that users with certain characteristics can contribute substantially to the development of radical innovation. Kristensson & Magnusson (2010) also state that, in the context of service innovation, 'ordinary' users with contextual use experience and without too much restriction because of deep technological expertise or knowledge on potential feasibility, are able to provide innovative ideas. Duverger & Hassan (2008) mention innovative capacities of 'defectors', also in the context of service innovation. These defectors have stopped using the service out of dissatisfaction with the current product offering. Duverger & Hassan have showed that this kind of 'ex-users' are able to generate radical new service ideas. another characteristic that can lead to better results in innovation processes: Research from Hoffman et al. (2010) showed that Lead Users provide better product ideas, but that 'emergent consumers' provide the 'best' new product ideas. These emergent consumers possess certain innovative and creative capacities and do not necessarily have a superior usage or product knowledge. Ozer (2009) adds to the discussion with his research demonstrating that users with high product-specific expertise are more useful for product evaluation in innovation processes, but users with product-specific Lead Userness are most useful in the final phases of innovation processes.

4 Integration of Characteristics

Out of all of the above, we can abstract five dimensions on which users and customers differ and that are relevant for innovation purposes: 'use experience', 'product related knowledge', 'new needs', 'dissatisfaction' and 'innovated themselves'. In the following table we construct six user types based on different levels on these five dimensions. These six user types are: 'ordinary users', 'extreme users', 'expert users', 'classic lead users', 'user innovators' and 'defectors'.

Table 1 User characteristics & user types

	Ordinary users	Extreme users	Expert users	Classic Lead Users	User innovators	Defectors
New needs	No	No	No	Yes	Yes	Yes
Dissatisfaction	No	No	No	No	Yes/No	Yes

Use experience	Low - Normal	High	Normal -High	High	High	Normal – High
Product related knowledge	Low – Normal	Normal	High	High	High	Normal
Innovater	No	No	No	No	Yes	Yes/No

'Ordinary users' are the users or consumers at the centre of the market. They do not have specific new needs that need to be fulfilled and they are not dissatisfied with the current offering. They have a regular use experience and have a 'normal' understanding of the product or service, without any specific technical knowledge.

'Extreme users' differ from ordinary users because they have a high use experience. They gained this experience because they display some kind of 'extreme usage' of the product or service. This extraordinary use experience gives this kind of users one of the two Lead User-characteristics mentioned by Lüthje (2003, cf. supra).

'Expert users' differentiate themselves from ordinary users because of their expertise in the technical domain. Therefore, they show a high understanding of the product or service and display the second Lead User-characteristic mentioned by Lüthje (2003, cf. supra).

The 'classic Lead Users' are users displaying both Lead User-characteristics (high use expertise and a high degree of technical expertise) and having a new need. This display of a new, unfulfilled need sets them apart from expert users and extreme users, but these classical Lead Users have not innovated themselves (yet), so this novel need is not solved (yet).

'User innovators' differ from the other user types because they have already innovated themselves. In order to be able to innovate, these users have a high use expertise and a high degree of technical expertise. Their innovative behaviour is motivated because they have encountered a new need that they wish to solve. Put differently, user innovators are classic lead users that have found a solution themselves to their novel need by having innovated themselves. When their motivation to innovate is also based on dissatisfaction with the current product/service offering, and they have stopped using the current product or service, this user type can also be labelled as 'innovating defectors'.

The last user type are the so-called 'defectors'. They can be separated from the previous categories because they are non-users. Because of a dissatisfaction with the current product or service, they have stopped using it. Therefore, they must have a new need that is not or not fully satisfied by the current offering, which grants them a Lead User-characteristic. As was demonstrated by Duverger & Hassan (2008, cf. supra) this user type can generate radical new service ideas.

5 Discussion

Within this paragraph, we will relate the proposed user and customer types with existing typologies where possible and propose some indicative guidelines towards their possible employment within concrete innovation processes.

First, ordinary users are normally used with 'voice of the customer'-methods, but Kristensson & Magnusson (2010) demonstrated that ordinary users can also provide innovative service ideas so ordinary users could play a role in ideation phases of the innovation process (cf. supra). For testing and market potential estimation purposes (cf.

De Marez, 2006), more in the back of the innovation trajectory, the voice of the ordinary user should also not be overlooked.

The extreme users resemble a lot the 'intense users' from Shih & Venkatesh's (2004) use diffusion framework. Intense users are defined as users using the innovation for multiple purposes and for a prolonged period of time. Within innovation processes, extreme users should also be included in early stages as their advanced and differing usage and routines for the current product or service might generate interesting insights in current practices that could stimulate innovative ideas. More in the back end of the innovation process, extreme users can be employed in order to some (technical) testing of the innovation. Their extreme usage patterns are especially useful because they are most likely to put the innovation 'to the limit'.

Expert users bear some resemblance with the 'pro-ams' from Leadbeater & Miller (2004), amateur users that have such knowledge and skills that they live up to professional standards. These expert users are especially useful for co-creation purposes, as their sound product related knowledge allows to perform more complex technical tasks and assignments. However, if relying only on expert users within an innovation trajectory, the danger exists that the innovation is too much based on the existing technologies resulting in incremental innovation, rather than looking beyond the current technological boundaries, something which is necessary to result in disruptive innovation.

Classic Lead Users are the ideal users to involve during the entirety of the innovation process, from ideation over co-creation to testing. Unfortunately, as noted before, they are also the hardest to track down. Are you dealing with 'true' Lead Users, having a novel need that will become general in the marketplace, or with 'freaks', users with a novel need that will never be general in the marketplace?

Innovating users are classic Lead Users that have already innovated. Therefore, they can be tracked down easier by detecting user innovation. As their novel need has already materialized into a concrete innovation, the 'true Lead Userness' versus the 'freakness' of the need can easier be assessed. Two problems can be identified with this user type. First, the existence and the number of innovating users depends on the product category, and can range from a substantial number of users to virtually none. Second, it is likely that the 'best' innovating users will become manufacturers themselves, something which has already been proven in the past.

Lastly, defectors are very useful for idea generation purposes, but seem less likely to be motivated to participate in an innovation project concerning a product or service which they have abandoned. Their willingness would be more likely if they have not found a solution yet to their new need. If this is the case, chances are however high that they will become innovating users/defectors.

6 Conclusion

We conducted a literature research looking for user and customer characteristics for involvement in innovation processes, consulting different research streams such as innovation management, marketing and innovation studies-literature. We started from the original Lead User-concept and moved on to research into user characteristics that are associated with Lead Users in particular or interesting customer types to involve in innovation processes in general. We motivated the rationale behind our research by demonstrating some ambiguities and problems associated with the practical application of the Lead User-concept. In order to effectively deconstruct the original Lead User-concept

into concrete and measurable characteristics, we searched for communalities in the different literature streams.

This lead to the abstraction of five relevant dimensions which led to the identification of six distinct user types. The synthesis of the Lead User and customer-characteristics into these user types tries to provide some concrete guidelines regarding the involvement of these types in innovation processes. As the dimensions are rather concrete, measurable, and thus 'workable', the given user typology could be immediately applicable in practice. However, we believe that future research should further elaborate on these user types and that practical case studies, implementing the given user typologies-framework, should try to effectively establish the added value of our approach. We particularly believe that an integration within the so-called 'Living Lab'-framework for innovation is possible and even very welcome. This is also something future research should address.

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