

Lead user roles and their functions: A framework

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Abstract:

In this paper we develop a framework of lead user roles and their functions. Two of the roles, innovating and diffusing are explicit in the lead user literature. The third role, the preventing role, captures how lead users act not to let inferior innovations be developed or spread. This role is much more implicit in lead user research and has until now thus received relatively less attention. Following that a high percentage of new products fail, it nevertheless seems important to consider how lead users could contribute to lower such failure rates by preventing inferior innovations.

For each role we specify functions. For instance, in their preventing role lead users may fulfil functions such as opinion seeking and use making. They may opinion seek their own innovation ideas in order to avoid developing inferior innovations and they may engage in use making, that is, display usage of an innovation they find superior but other users do not (yet) find superior, in order to prevent diffusion of currently commercially available products. In specifying functions of each role we particularly pay attention to how functions within a single role, as well as between roles, are conceptually distinct from each other.

We argue that is important to elaborate on different roles played by lead users, for instance, due to that even in situations when lead users develop inferior innovations themselves, they may play important roles by for instance; preventing other inferior innovations from reaching the market or by recommending an innovation they perceive to be superior. Based on our developed framework we provide directions for future research.

Keywords: lead user theory, lead usersness, diffusion, innovation, opinion seeking, opinion leadership, use making, prevention, adoption

INTRODUCTION

Lead users are those who in a given domain are ahead of an important market trend and expect high benefits from innovating (von Hippel, 1986). These users thus face needs today that the majority of the market will not experience until tomorrow and they would feel increased satisfaction from finding a solution to their current needs. As a consequence hereof, lead users may come up with innovations today that subsequently will become highly attractive to a major bulk of the marketplace (Schreier and Prügl, 2008). Hence, it follows from the lead user concept that these users may play an important *innovating role*.

Mainly, previous lead user studies have focused on this innovating role. Such studies have empirically found lead userhood to explain both likelihood of user innovation (see Morrison et al 2000; Lüthje, 2003) and likelihood of attractive user innovation (Franke and von Hippel, 2003; Franke et al, 2006). The other main issue studied with regards to the lead user concept is how to apply the lead user method, being an approach for utilizing lead users in innovation projects. Such studies have in particular addressed the challenge of how to correctly identify a dominating trend (von Hippel et al, 1999; Lüthje and Herstatt, 2004) and how to efficiently identify lead users along such a trend (see Bilgram et al, 2008; Belz and Baumbach, 2010). Yet other studies have addressed antecedents and consequences of lead userhood. From such researches other roles played by lead users than just the innovating one can be extracted. They may play a *diffusing role* both in terms of being early adopters of new products in a given domain themselves (Morrison et al, 2004; Schreier et al 2007) and by recommending new products to other users thereby helping to speed up the diffusion rate (von Hippel, 2005; Hienerth, 2006). Also, lead users may play a *preventing role* by acting not to let inferior innovations be developed or spread. For instance, they can exert this third role by opinion seeking their own ideas (see Hienerth and Lettl, 2011) not to develop an inferior innovation and making use (showing) of their own innovations (Hienerth and Lettl, 2011) in order not to let inferior innovations spread. The preventing role has until now been much more implicit and received less attention than the other two roles in previous lead user research.

In the current paper we elaborate on the three above mentioned lead user roles, that is: innovating, diffusing, and preventing. More specifically, we specify functions of each role by drawing on previous lead user research and related literatures (see Kram, 1983 and Ragins and Cotton, 1999 for more on roles and functions)¹. In specifying functions we particularly focus on how functions within a single role as well as between roles are conceptually distinct from each other. For the following reasons we think that it is important to start elaborating on different roles played by lead users, something which until now has received scarce attention in the lead user literature;

- i) Even in situations when lead users develop inferior innovations themselves, they may play important roles by for instance; preventing other inferior innovations from reaching the market or by recommending an innovation they perceive to be superior
- ii) Given that different roles are distinct, how they one by one versus taken in different combinations influence the commercial success of an innovation is worthwhile studying for obtaining an improved understanding of the importance of lead users.
- iii) Perhaps even, the different roles may be fruitful for categorizing and structuring lead user research as this body of studies continues to grow following its merits.

¹ For instance the mentoring role could include functions such as sponsoring, coaching and protecting (Kram, 1985). Similarly, the teacher role may include functions such as instructing, encouraging and grading.

The present paper is organized as follows. First, we elaborate on each of the three roles as described above. Based on the elaboration we next develop a framework constituted by the roles and their functions. Finally we suggest directions for future research based on our generated framework.

THE INNOVATING ROLE OF LEAD USERS

With the innovating role we here refer to how a lead user contributes in a necessary way to a new product being developed. Drawing on previous research we distinguish between three functions of this role; *new product creation*, *idea generation* and *assistance providing*.

New product generation. That lead users innovate has increasingly and continually been reported the last 20 years. Findings reveal that incremental contributions to existing products (see Morrison et al, 2004) as well as totally new products (Lüthje, 2003; Franke et al, 2006) are being generated by such users. For in depth reviews of such findings see Lüthje and Herstatt (2004) and Schreier and Prügl (2008). Sometimes new products are developed by single lead users, at other times by lead users taking part in a company driven new product development project and at yet other times by a group of lead users. How effective these different lead user development modes (single lead user, group, company) are for new product creation under different innovation conditions would be interesting to further explore. Cost-benefit analyses of innovation mode (see Lüthje and Herstatt, 2004 for a review) are potentially useful input to such studies. Critical Success factors studied in new product development literature such as process style (Varela and Benito, 2004) and nature of the market (Gonzales and Palacios, 2002) may also be informative in this regard.

Idea generation. Sometimes users generate an idea being developed into a new product by someone else (Baker et al, 1986; Kim and Wilemon, 2002). Hence, a company as developer may in all other respects have greater know-how on how to develop the new product based on a lead user generated idea (Lynn et al, 1996; Lüthje and Herstatt, 2004). Lead users are likely particularly well suited for idea generation relative to other users or people employed in product development (see Lilien et al, 2002). This follows from them being ahead of a market trend and finding current commercially available products insufficient in satisfying their needs. A next step for an improved understanding of lead users idea generation function could be to explore antecedents of attractive lead user generated ideas. Studies of antecedents of lead userness (Franke et al, 2006; Schreier and Prügl, 2008) as well as studies on creativity (Kratzer and Lettl, 2009) and problem-solving (Gist, 1989; Paulus and Yang, 2000) might here be useful input.

Assistance providing. It has been empirically found that lead users draw on their local innovation related resources such as higher technical capabilities and community peer support when creating new products (Franke et al, 2006). Except for Hienerth and Lettl's (2011) in depth study of how lead users draw on their peer community in new product creation, in which it was reported that early on in an innovation process a lead user to a higher extent seem to rely on other lead users than other users, much is yet to be explored on how lead users assist each other. A lead user may have an important assisting function in one or more stages of an innovation project. For instance, this could range from recommending peer lead users for a particular innovation project thereby significantly lowering the cost for the innovator to identify and select such users in the front-end of that venture (Chesborough, 2003; Bilgram et al, 2008; Kratzer and Lettl, 2009) to testing prototypes of new company generated products at the back-end of an innovation project (von Hippel, 1986). Although there is much evidence of the value of lead users for innovation, more is to be known on the relative value of different kinds of lead user assistance for commercially attractive new products.

We mean that the above three functions are distinctly different from each. That a lead user creates a new product is not the same as that he develops an idea for a new product. He may thus develop the idea without a new product being created. The whole point with developing the initial idea may be the hope that someone with sufficient resources starts an innovation project to create a new product based on the idea. Further, these two functions are distinct from the third one. This follows from that generating something new is different from assisting someone else who generates something new. In the assisting function the lead user rather helps out by providing input to be evaluated by the innovator who creates. Further, the rationale for creating likely differs from the rationale for assisting. In line with lead user theory we mean that a lead user mainly generates an idea or a product in order to better satisfy his needs by being able to consume the innovation. The rationale for assisting on the other hand is likely of other kind. A lead user may assist because he gets paid to do so by a company. Also he may help out because he likes to provide certain assistance per se, such as for instance testing a prototype due to being predisposed to new things. He may even help out to satisfy a closely related peer lead user's needs rather than to satisfy his own needs.

In sum, a lead user may contribute in a necessary way to an innovation by creating it, by generating the idea for it or by providing assistance in the generation process.

THE DIFFUSING ROLE OF LEAD USERS

With the diffusing role we here refer to how a lead user contributes to the spread of an innovation (Rogers, 1983; Abrahamson, 1991). Drawing on previous research we distinguish between three functions of this role; *adoption, opinion leadership and marketing*.

Adoption. By adopting new products lead users spread the use of those products. Following their leading-edge status lead users have been found to more heavily and quickly adopt new products compared to ordinary users (Morrison et al, 2004; Schreier et al, 2007). As the earliest adopters of new products lead users may be particularly important for the extent and speed of diffusion. Beyond that, it would be interesting to further explore how lead user needs as well as different user group categories such as lead users, ordinary users and non-users (such as others in the lead user's social network) influence a lead user's heavy adoption behavior. It may also in this regard be worthwhile considering whether lead users relative other user groups to a higher extent find a stimulation or uniqueness value from adoption per se (Roehrich, 2004). Also, if they expect lower perceived risk adopting new products relative other user groups might also be worth considering (Schreier et al, 2007).

Opinion leadership. Opinion leaders are those who directly influence other consumers by giving advice and verbal directions for the search, purchase and use of a product (Flynn et al, 1996). How opinion leaders positively influence the speed and rate of diffusion of innovations have been extensively reported (Rogers, 1983; Dearing, 2009; Goldsmith and Witt, 2010). Lead users, through their leading-edge status, has been found to function as opinion leaders (Morisson et al, 2004; Schreier et al, 2007). By informing others about a new product alternative, by explaining how a complex product works or by recommending a product a lead user may act as opinion leader influencing others adoption of new products. They may further act as opinion leaders both with respect to their own innovations (von Hippel, 2005; Hienerth, 2006) as well as with respect to others innovations. To what extent lead users are opinion leaders for different user groups (other lead users, ordinary users, non-users) and how effective they are as opinion leaders for the spread of innovations could be issues to further study.

Marketing. A lead user who has come up with an innovation may engage in marketing activities that directly leads to the new product being diffused. This could range from offering a free trial of the new innovation to selling it. Hienerth and Lettl (2011) with regards to free trial report case study evidence that lead users supply selected community members with inexpensive versions or free test versions thereby fuelling attraction of the innovation by the larger community. With regards to selling the innovation, the authors found that several lead users who have come up with an innovation shifts to a commercial focus by starting up a company. Further, as repeatedly reported on, lead users also many times cooperate with companies who may have more marketing resources and higher marketing skills (Morrison et al, 2004), this way bringing their innovation to the market. It would be interesting to explore what marketing activities lead users engage in with respect to different types of innovations and user groups.

We mean that the three functions of the diffusing role of lead users are distinct from each other. Starting to use new products oneself is not the same as influencing others to start to use new products, hence the distinction between the adoption function and the other two functions. Further, the opinion leadership function is distinct from the marketing function in that providing information and advice to a potential user about a particular product is not the same as offering that particular product per se to the potential user. Also, the marketing function captures only the lead user's own innovations developed while opinion leadership spans also innovations developed by others in a given domain. One can thus be a lead user who innovates, without having marketed ones innovations, and yet still be an opinion leader.

In sum, the lead user can contribute to the spread of innovations, by starting using them himself, by providing information and advice on them to other potential users or by simply offering usage of them to others.

THE PREVENTING ROLE OF LEAD USERS

With the preventing role we refer to how lead users do not let inferior innovations be developed or spread. Drawing on previous studies we distinguish between three functions of this role: *opinion seeking, assessing and use making.*

Opinion seeking. While opinion leadership is about giving advice to others opinion seeking is about searching out advice from others (Flynn et al, 1996). In a given product domain there are thus generally two types of consumers, opinion leaders and opinion seekers (ibid). Schreier et al (2007) hypothesized and found leading-edge status, which lead users by definition to a high extent display, to be significantly and negatively related to opinion seeking. However, the measurement scales used for opinion seeking, based on Flynn et al's (1996) construct development, are restricted to capturing purchasing of products. Although lead users may act as opinion leaders rather than opinion seekers when buying new products, as is empirically found by Schreier et al (2007), they may still display opinion seeking rather than opinion leadership when it comes to their own new ideas for innovations. Hienerth and Lettl (2011, p. 185) report case study evidence, that in the early innovation stage, lead users turn to their peer community for advice: *"In the medical industry, the lead users revealed their innovative thoughts to peer surgeons in their informal network who were open to completely new approaches. In the sporting equipment cases, the lead users shared their ideas with fellow professional kayakers and received feedback both about the idea itself..."*. This way, advice from others can inform the lead user about whether to proceed with developing an idea for an innovation or not. In this sense, other users' feedback may function to prevent inferior innovations from being developed. It would be interesting to further explore lead users' opinion seeking with regards to other processes than buying new innovations, such as idea generation and needs for a particular innovation.

Assessing. Given that lead users face needs today that most others will face tomorrow (Franke et al, 2006; Hienerth and Lettl, 2011) along with that they display high levels of consumer knowledge (Schreier and Prüggl, 2008) and use experience (ibid) they are likely to be better suited for assessing the attractiveness of innovations relative other users in that domain. They may thus, in a given domain, make more informed assessments of innovations that are either under development or having been recently introduced on the market. We mean that they here may fulfill an important function by rejecting what they perceive to be inferior innovations and inferior innovation development initiatives. For instance, by testing prototypes and assessing which are likely to be inferior, lead users can advise the innovator not to pursue and market such products which the large many users later on will find inferior (Cowan, 1990). Also, by rejecting ideas for new innovations early on lead users can prevent large investments projects to be initiated thereby also helping innovators no to use resources inefficiently (see Hienerth and Lettl, 2011). Also, the rejection of innovations by lead users before those reach the market may spur innovators to find out reasons for that rejection. For the above mentioned reasons it would be interesting to explore the antecedents of lead user rejection of innovations/ innovation development. Tolba and Mourad's (2011) theorizing on what innovation attributes explain innovation acceptance may be informative to such explorations.

Use making. It has been pointed out that many times a lead user's needs are very specific (Franke and von Hippel, 2003; Lüthje and Herstatt, 2004). In such a situation, a lead user who thinks he has developed a superior innovation may refuse to accept that others do not (yet) find it superior. As a response, he may therefore continue to persistently use the innovation to signal its superiority to others. Hienerth and Lettl (2011) report on such lead user behavior. For instance, they refer to how single lead users of sport equipment increased their participation in competitions in order to signal to others how their innovative equipment is technically superior. We mean that lead users play an important preventing role by persistently engaging in use making of their innovation. Hence, by doing so they signal that commercially available products are inferior. Displaying such use making behavior might even in some situations be important for avoiding that inferior products become standard equipment in the market (Cowan, 1990). Especially, this function fulfilled by lead users is of importance when that lead user's specific needs today will be needs faced by most others tomorrow. Hence, need heterogeneity is reduced over time such that it is more in line with the use maker's current needs. Beyond Hienerth and Lettl's (2011) observations of use making it would be interesting to explore how to, within the lead user category, identify use making behavior by lead users and its consequences for innovation development and innovation diffusion.

We argue that the three functions referred to above are independent. Opinion seeking refers to how the lead user seeks information and advice from others while assessing denotes how the lead user functions as evaluator. Hence, in the first function the lead user is the receiver of advice and in the second function he is the sender of advice. In the third function, the lead user is neither taking advice nor evaluating but instead using to convince, hence the distinction between the functions.

In sum, a lead user can prevent inferior innovations from reaching and spreading on the market by: discontinuing his innovation initiatives, by helping others to discontinue their innovation initiatives, and by only using what he thinks are superior innovations.

LEAD USER ROLES: A FRAMEWORK

Drawing on previous studies we have identified three lead user roles: innovating, diffusing and legitimating. Two of them, innovating and diffusing, have been more explicitly expressed in previous studies while the third role is not as explicit. Also, until now the third role is the one which by far has obtained least attention in the literature. Nevertheless, following indications that on average 40% of all new products fail across industries (Crawford and Di Benedetto, 2008) and that only a few become standard equipment in the market (Utterback, 1996; Hienerth and Lettl, 2011) it seems important to consider how lead users can contribute to lower such failure rates. In their preventing role lead users can help avoiding such new product failure by rejecting initiation of development projects, by discontinuing their own innovation project or by recommending other innovators to discontinue their development projects. This way, spending or continued spending on inferior innovation initiatives can be avoided (see Sanders and Manrodt, 1994). The findings that lead users are heavy adopters of new products and face the needs today that many others will face tomorrow may make them particularly well suited for preventing inferior innovations.

We mean that the lead user's innovating, diffusing and preventing roles are independent of each other. That the lead user creates an innovation is not the same as that he contributes to how that innovation or another innovation is spread, hence the distinction between the innovating and diffusing role. Further, how the lead user discontinues an innovation project or contributes to another innovator discontinuing an innovation project is different from creating or spreading innovations. Hence, the latter role captures prevention of inferior innovations while the former two roles capture how to generate and spread innovations that are likely to be commercially attractive. In the figure below we depict a framework showing the three roles we have identified as well as the functions of each role we have identified based on previous research:

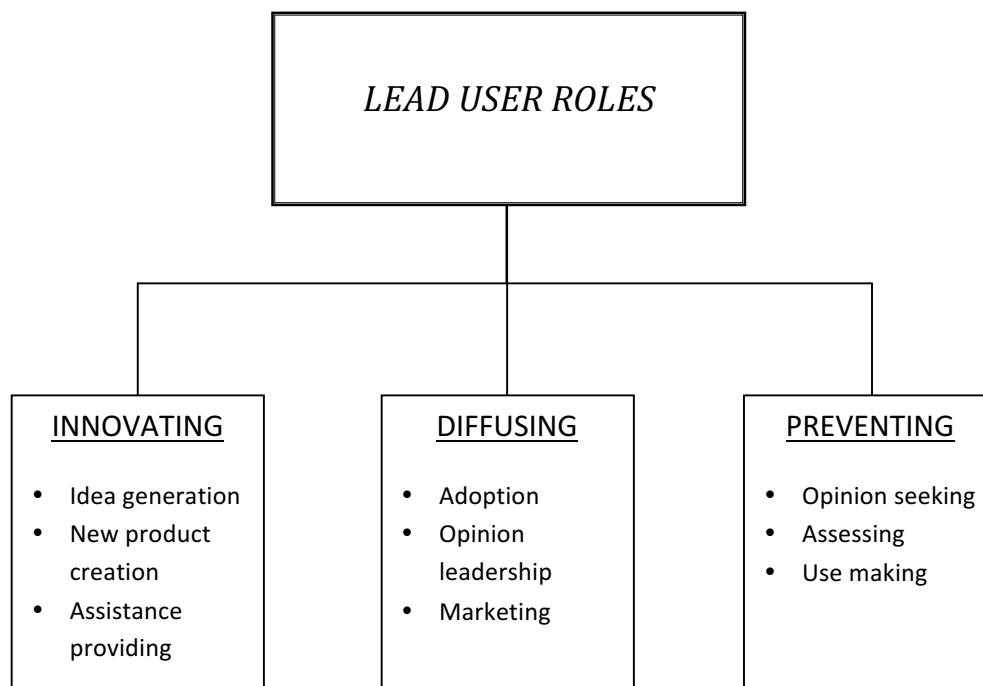


Figure 1: Lead user roles for innovation

For the three roles to be independent of each other the functions across roles, depicted in figure 1 on the former page, need to be independent. In particular, previous studies have addressed the distinction between two of the functions depicted figure 1, namely, whether opinion leadership is conceptually different from opinion seeking (Flynn et al, 1996; Shoham and Ruvio, 2008). The argumentation in the literature goes that there are opinion seekers that are not opinion leaders and hence the two constructs ought to be independent. Empirical studies, overall suggest that the two constructs are independent, however the direction of the relationship seems somewhat unclear. Shoham and Ruvio (2008) find a negative correlation between opinion leadership and opinion seeking ($r = -.56$) in the software context and Girardi et al (2005) report a negative correlation ($r = -.35$) for fashion consumption while Bertrandis and Goldsmith (2006) report a positive correlation ($r = .26$) studying wine consumption. Also, in a study of lead users, Shreier et al (2007) find the two constructs to be weakly and negatively correlated ($r = -.13$) in the technical diving context thereby providing further indication of the two constructs independence.

A few other functions in our framework may somewhat share variance on the theoretical level. For instance, assistance providing and opinion leadership may be somewhat correlated. This follows from that both assistance providing and opinion leadership captures providing information and advice. However, we mean that while opinion leadership by lead users is directed towards consumers their assistance providing is directed towards producers (innovators). Therefore, the two constructs also ought to be independent and weakly correlated.

Also, assistance providing and assessing may be somewhat correlated. However, while assistance providing only captures innovations that are currently under development assessing also captures innovations recently introduced on the market. Further, assessing captures how lead users reject solutions while assistance providing captures how lead users contribute by coming up with solutions to problems. Therefore, we mean that these two constructs are also independent.

Although the framework is but a depiction of roles and functions of roles, it still highlights that lead users may play different and important roles with regards to innovation. The importance of explicating these roles in a framework can be understood from that it gives rise to questions such as how lead users by playing a single role contributes to a commercially attractive innovation outcome, or, how they by playing multiple roles at the same time are contributing to such innovations. Also, how a lead user's tradeoffs made between playing different roles matter for commercially attractive innovations could also be worthwhile considering. Further, the preventing role as well as some of the functions identified has until now been less explicit in the lead user literature. In the next section we based on our generated framework finalize by providing some suggestions for future research.

DIRECTIONS FOR FUTURE RESEARCH

In this paper we have identified lead user roles as well as different functions of each role. The roles and their functions have been identified by drawing on previous lead user research and related literatures. Throughout this paper we have suggested possible ways of extending lead user research. Some of these ideas may be particularly interesting to consider in future lead user research, hence we summarize them below.

On lead users' innovating role it would be interesting to explore antecedents of attractive lead user generated ideas. Hence, under what conditions and with what resources at hand do lead users develop ideas with high potential for commercially attractive product outcomes? Also, with regards to company driven innovations projects is it that some kinds of lead user assistance are more important than other such assistance for attractive new product creation?

For lead users diffusing role it would be interesting to explore how they act as opinion leaders with respect to different user groups, and how effective they are as opinion leaders as well as in different opinion leading activities. In turn, deeper knowledge might be gained on how lead users contribute to speed up diffusion rates via opinion leadership. Also, it would be interesting to explore what marketing activities lead users engage in with respect to different types of innovations and user groups. Especially free marketing, such as free samples, freeware, and free testing has been paid scarce attention in lead user research until now.

Concerning their preventing role, it would be interesting to extend studies on lead users' opinion seeking and opinion leadership beyond buying behavior. Hence, how lead users act as opinion seekers with respect to idea generation and needs may further help display how lead users are distinct from other user groups. This may in turn be informative to why lead users relative other user groups are found to come up with more attractive innovation, or if they to a lower extent develop inferior innovations. Lastly, how lead users engage in use making, that is, display usage of an innovation they find superior but other users do not (yet) find superior, would be interesting to further explore. Hence such behavior may potentially be important for avoiding that inferior products become standard equipment in the market.

Finally, following our quite many suggestions in this paper of how to extend lead user research and especially following the merits found for applying lead user theory in previous studies, it seems as if this is not the beginning of the end but rather the end of the beginning of lead user research.

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