halshs-00851319, version 1 - 13 Aug 2013

CERAG
www.cerag.org
Centre d'Etudes et de Recherches Appliquées à la Gestion_ U.M.R. C.N.R.S. 5820

CAHIER DE RECHERCHE n°2012-01 E3

WHAT DRIVES LEAD USERS TO BECOME USER ENTREPRENEURS ?

AN EXPLORATORY STUDY OF MOTIVATIONS

HAMDI-KIDAR Linda
VELLERA Cyrielle

Unité Mixte de Recherche CNRS / Université Pierre Mendès France Grenoble 2
150 rue de la Chimie – BP 47 – 38040 GRENOBLE cedex 9
Tél. : 04 76 63 53 81 Fax : 04 76 54 60 68

halshs-00851319, version 1 - 13 Aug 2013

What drives lead users to become user entrepreneurs?

An exploratory study of motivations

Linda Hamdi-Kidar[1] and Cyrielle Vellera[2]*

[1] PhD Candidate, University of Toulouse, France

[2] PhD Candidate, University of Grenoble, France

Abstract

Regardless the type of industry, it has been shown that users, and more specifically lead users, are among the prime developers of truly novel solutions. Most stop before market launch of their innovation, but others go further and start their own firms. While an encouraging body of literature has proven the crucial role and the commercial interest of integrating lead users in the innovation process, little research has been done concerning motivations that drive these individuals to become firm-founders. In this article, we identify the intrinsic and extrinsic motivations that drive some lead users to switch from an innovator role to an entrepreneur role.

Keywords: Lead users ; User entrepreneurs ; User Innovation

Correspondence to:

[1] Linda Hamdi-Kidar: linda.hamdi@iae-toulouse.fr

[2] Cyrielle Vellera: cyrielle.vellera@upmf-grenoble.fr

*The authors are listed alphabetically and contributed equally to the research.

halshs-00851319, version 1 - 13 Aug 2013

halshs-00851319, version 1 - 13 Aug 2013

1. Introduction

"*I'm Gary Fisher. I've been called the founding father of mountain biking. I don't know about that, but I do know this: I love bikes. Riding them, building them, making them better*". In the early 70s, Fisher wanted a bike he could ride off-road, away from "*cops, cars, and concrete*" [1]. He went on to develop a new genre of biking. Later, he decided to go into business and created a bicycle company called Mountain Bikes. Fisher's case clearly illustrates the double role that a specific group of users – namely lead users – can play as a source of new products and as entrepreneurs. While an encouraging body of literature has proven the crucial role and the commercial interest of integrating lead users in the innovation process of firms (Enkel *et al.*, 2005; Herstatt and Von Hippel, 1992), little has been done concerning the motivations that drive these users to become firm-founders. The research question we address in this paper aims to point out why, in some cases, lead users are motivated to commercialize their solutions and create firms. To answer this question, we propose qualitatively exploring lead user motivations as inspiration for becoming user-entrepreneurs.

In the following, a review of user phenomenon is first presented. The lead user and user-entrepreneur concepts are then developed. Next, a description of our research methods and findings are presented. To conclude, implications, limitations and suggestions for future research will be discussed.

Users as innovators

Innovation is still an undoubted key driver of long-term firm competitiveness and financial success. Thus, companies are continuously seeking new ideas for marketable products. But even if launching new products is a major activity for firms (Goldenberg *et al.*, 2001), the risk of failure remains high (Barczak *et al.*, 2009). To reduce this risk, scholars and practitioners have long advocated aligning key activities within new product development projects with the needs of actual and potential users (Jaworski and Kohli, 1993; Atuahene-Gima, 1995; Lüthje and Herstatt, 2004). Nevertheless, responding to users' fulfillment needs remains difficult and time-consuming (Tidd *et al.*, 2001). To sustain this action, companies should involve "*capable actors*" both inside and outside the firm at the earliest stages of new product development (Chesbrough, 2003; Lettl *et al.*, 2006). Indeed, "*companies need not and indeed*

[1] http://www.trekbikes.com/uk/en/collections/gary_fisher/

halshs-00851319, version 1 - 13 Aug 2013

should not rely exclusively on their own R&D" (Chesbrough and Crowther, 2006). Besides, one external source that is a salient entity for innovation is the user (Lettl, 2005; Enkel *et al*., 2005). In this line of research, it has been well documented that a large fraction of the most commercially attractive industrial and consumer products or services have been developed by users (Enos, 1962; Freeman, 1968; Von Hippel, 1988; Shah, 2000; Baldwin *et al.*, 2006). Thus, there is widespread consensus that users can provide valuable input concerning innovation and enhance cross functional innovation team effectiveness. Consequently, the "*user active paradigm*" now has a dominant roll as compared with the "*manufacturer active paradigm*" (Von Hippel, 1978). However, ordinary users of the target market struggle to generate truly novel products. Ideas generated by these users are generally low-to-medium radical innovations and rarely "breakthroughs" contributing, consequently, marginally to firm product portfolios (Lilien *et al*., 2002; Lüethje, 2003; Lüethje *et al.*, 2005). According to Lettl (2005), this passive and sometimes counterproductive contribution can be due to (1) cognitive limitations (a barrier of not knowing) and (2) a lack of motivation (barrier of not wanting). Representative users are usually cognitively constrained by their real-world experience (Lettl *et al*., 2006; Von Hippel, 1986). As illustration, "*users steeped in the present are thus unlikely to generate novel product concept which conflict with the familiar*" (Von Hippel, 1986). They suffer from a "*functional fixedness*" effect (Duncker, 1945) which prevents individuals from using or envisioning a familiar object in a novel way and/or with new functions. Faced with this limitation, literature about user-driven innovation underlies the role and contribution of another specific group of users -namely lead users- as a major source of innovation (Von Hippel, 1986, 1988; Urban and Von Hippel, 1988).

Who are lead users?

Von Hippel (1986) was the first to investigate a phenomenon observed in different fields: attractive innovations could emerge from a certain type of user, called lead users. The Lead User theory was first applied to industrial goods such as computer-aided design (CAD) software (Urban and Von Hippel, 1988) or medical equipment (Lüthje, 2003), but it has been gradually extended to consumer goods such as extreme sports equipment (Franke and Shah, 2003; Lüthje *et al.*, 2005). Depending on the sector, lead users come up with first-of-type, major or minor innovations (Von Hippel *et al.*, 1999). Today, many case studies have proven the commercial interest of integrating these users in the innovation process with *the lead user method* (Enkel *et al.*, 2005; Herstatt and Von Hippel, 1992). This four-step procedure aims to

halshs-00851319, version 1 - 13 Aug 2013

develop new concepts in line with a defined innovation trend via collaboration with lead users during a set of workshops. For instance, the use of this method at the 3M Company has led to many breakthroughs ranging from the "*post-it"* to medical radiology equipment. Furthermore, on average lead user projects have shown sales potential eight times higher than traditionally developed concepts (Lilien *et al.*, 2002). Other examples like Hilti, or Jonhson & Jonhson medical (Lüethje and Herstatt, 2004) reinforce the idea that the lead user method increases the potential for developing commercially attractive innovations.

While many studies focus on the interest of integrating these users in new product development processes, several studies also outline the characteristics for identifying and selecting theses users. Lead users are generally defined by two main characteristics (Von Hippel, 1986):

First, they are "*ahead of the general market trend"*, meaning they experience needs that the rest of the market will face months or years later. Innovations generally follow a major trend. Schreier and Prügl (2008) show that major trends for sailplaning and tech diving were respectively, covering ever-longer distances and covering ever-longer periods of time in complex and difficult environments. Another example of a major trend is the increasing density of the printed circuit CAD software (Urban and Von Hippel, 1988). Lead users are positioned at the leading edge of a trend, and thus have a global view of the future mainstream market needs.

The "*ahead of a trend*" characteristic is assumed to be positively linked to both (1) the commercial attractiveness of a user-developed innovation and to (2) the user innovation likelihood (Franke *et al.*, 2006).

Second, they "*expect high benefits*" from a solution to their advanced needs. It has been shown that the degree of the benefit to be obtained from an innovation is positively linked to a person's or a firm's involvement in finding a novel solution (e.g. Mansfield, 1968). Franke *et al.* (2006) show that this second characteristic predicts the likelihood of user innovation. Investment in finding an innovative solution can result in two sources of benefits: using it and/or selling it (e.g. Von Hippel 1988, Lüthje *et al*., 2005, Baldwin *et al.*, 2006, Hienerth, 2006). Hienerth *et al.* (2007) reported that the benefit from using an innovation significantly influences the generation of truly novel solutions. For instance, Shawn Fanning directly benefited from its software solution and decided to found his own firm: Napster. This example clearly illustrates the different functional roles a lead user can have over time.

halshs-00851319, version 1 - 13 Aug 2013

Whereas the two lead user characteristics are already clearly identified, others have been highlighted. In a consumer product market study, Lüthje (2004) identified a new characteristic and showed that level of expertise has a positive impact on lead-userness. Both use experience and product-related knowledge are at the origin of user expertise (Alba and Hutchinson, 1987). The first source relates to product usage (i.e. experience gained from the use environment and frequency of use) whereas the second one relates to the information gained from different external sources and allows obtaining a diverse set of competencies to innovate (Schreier and Prügl, 2008). Several studies confirmed that use experience helps predict the generation of innovative contributions (e.g. Von Hippel, 1994; Hienerth *et al.*, 2007).

Moreover, Franke *et al.* (2006) show that lead users generally benefit from the local resources of the (online) community they belong to. They give evidence that the user's local resources have a positive impact on the likelihood that the user will innovate, to the extent that they are embedded in a supportive environment (Lettl *et al.,* 2006) implying the availability of free assistance from peer members.

Further characteristics that distinguish lead users from non lead users are the early adoption of new products/services and opinion leadership. The first item refers to an individual's tendency to adopt new products or services within a given field of interest before the rest of the mainstream market (Rogers, 1994). Many studies reveal that lead users are earlier adopters of innovations as compared to the bulk of users (e.g. Urban and Von Hippel 1988; Schreier *et al.*, 2007). Concerning opinion leadership, different studies have explored the links between innovators and opinion leaders (e.g. Béji-bécheur and Gollety, 2007; Spann *et al.*, 2009). They found that the two constructs were strongly linked: "*lead users can act as opinion leaders at the same time*" (Kratzer and Lettl, 2009). These results reinforce the idea that lead users are not only valuable at the front end stages of the innovation process but also at the last stages with the launch of new products and services.

While most research has focused on new characteristics to identify users that develop commercially attractive innovations, little work has thus far been done to understand the functional role transition that can occur when lead users who act as innovators turn into entrepreneurs.

Who are user entrepreneurs?

While the importance of user innovation has been widely recognized and well documented, the user entrepreneurship phenomenon is relatively understudied in the existing literature.

halshs-00851319, version 1 - 13 Aug 2013

Shah and Tripsas (2007) define this phenomenon as "*the commercialization of a new product and/or service by an individual or group of individuals who are also users of that product and/or service*". The authors distinguish two categories of user entrepreneurs: professional-user entrepreneurs and end-user entrepreneurs.

Professional-user entrepreneurs are characterized as follows: generally, in their job or business they use a product and identify a need regarding it. Consequently, they naturally develop their own solution for improvement. Afterwards, they decide to leave their company to enter the commercial marketplace by founding their own firm. Some authors have observed and point out this phenomenon in various fields such as the typeset industry (CRT phototypesetters and laser imagesetters) (Tripsas, 2008), the transition from ice harvesting to mechanical refrigeration (Utterback, 1994) and the commercialization of a near-field scanning optical microscopy, known as "probe microscopy" in the atomic force microscopy industry (Mody, 2006).

Conversely, end-user entrepreneurship takes a different approach from the professional-user entrepreneurship. Basically, end-user entrepreneurs are individuals who face a problem or experience a need for their personal use in their day to day lives, develop a solution and a prototype to address that need and have a deep desire to share their solution with others before starting a for-profit company. They subsequently and apparently engage themselves in entrepreneurial opportunities and paths as opposed to simply using their innovations by themselves.

By and large, the innovation literature shows that although a large fraction of users innovate frequently, they rarely commercialize their innovations or have been involved in the commercialization process. Consequently, they capture limited economic value and financial gains from their innovations (Von Hippel, 1988). However, Shah and Tripsas (2012) note that entrepreneurship by end-users is more widespread than early assumptions would indicate. They propose diverse alternative commercialization outcomes. Indeed, users can "*share innovations freely with manufacturers, license innovations to manufacturers, or attempt to commercialize their innovations independently […] or not commercialize at all*" (Shah and Tripsas, 2012). Thus, it has been documented that users are an important source of entrepreneurial activities across a wide area of product classes. End-user entrepreneurship has been analyzed in stereo components materials (Langlois and Robertson, 1992), extreme sports and outdoor industries (skateboarding, snowboarding and windsurfing equipment) (Shah, 2003), mountain biking (Lüthje and *al*., 2005), the automobile sector (Franz, 2005), the rodeo

kayak sporting field (Baldwin *et al.*, 2006), juvenile products (Shah and Tripsas, 2007) and cinematography (Haefliger et al., 2010). In a similar vein, Shah *et al*. (2012), through a longitudinal survey of 4,928 American firms, showed that 10.7% of all start-ups and 46.6% of innovative start-ups in all-industries in 2004 were founded by users; "*these findings suggest that user founded firms introduce many novel products and services to the marketplace*" (Shah *et al*., 2012). To this end, user entrepreneurship occurs more frequently in the enjoyment business and user entrepreneurs commercialize their innovations in high potential nascent markets and segment niches (Shah and Tripsas, 2007).

In another detailed documentation, Shah *et al.* (2012) investigate founder demographics and user founded firm characteristics. They observe that professional-user entrepreneurs and end-user entrepreneurs differ significantly in a wide variety of ways. Specifically, their striking findings show that firms founded by professional-user entrepreneurs are less likely to be created at home, experience less self-financing and are more likely to generate bigger revenues than do end-user entrepreneur firms. Additionally, professional-user entrepreneurs are highly skilled and have more industry work experience, receive more significant pecuniary gains from their innovations and employ more workers. In contrast, the authors argue that firms whose founders are end-user entrepreneurs possess fewer resources and are more heavily self-financed. End-user entrepreneurs are more likely to be female.

Moreover, Shah and Tripsas (2007) showed two sources of divergence when comparing the user-entrepreneurship process and the classical entrepreneurship model. First, the user entrepreneurship process tends to be "*emergent*". Users are often "*accidental entrepreneurs*" because the creation, development, adaptation, and testing appear prior to founding a firm. Second, the user entrepreneurship process is a "*collective*" process. User entrepreneurs tend to benefit from the feedback and contributions of a community in terms of improvements and word of mouth diffusion.

Finally, little has been done concerning the motivations that drive these users to become firm-founders. To Shah *et al.* (2012), the decision to found a firm is largely motivated by the expectation and desires to capture financial returns and profits. In the same line of research, Shah and Tripsas (2007) add that "*the desire for financial gain is only one motive for entrepreneurial activity […] a wide variety of motives may propel an individual to found a firm*". This last point is the core of our research. We want to explore the drivers for lead user commercialization decisions.

halshs-00851319, version 1 - 13 Aug 2013

halshs-00851319, version 1 - 13 Aug 2013

2. Methodology

In this research, we empirically explore what drives lead users to commercialize their innovations and start their own firms. Our methodology's aim is to identify and qualitatively interview lead users who became entrepreneurs. We have not targeted one industry rather another for two reasons. First, lead users are "rare" subjects among the population (Von Hippel *et al*., 2009) so we expect that lead users who found firms are rarer. Second, so as to not bias and limit the external validity of our results we wanted to maximize product categories in the sample. Therefore, our initial sample is constructed based on membership in the "National French Inventor Association", FNAFI[2]. This association coordinates national efforts to support independent innovators. It provides concrete measures to facilitate the innovation process and encourage these actors. The FNAFI is divided into 16 units corresponding to different regions in France. We initiated prospective phone contacts and/or emails with the unit chiefs to obtain member listings. The sample was limited to individuals who were lead users and have developed a product with which they subsequently started their own firm, either successfully or unsuccessfully. We then excluded members of the FNAFI who had an innovative idea and who developed prototypes without selling their products. We also excluded individuals who were not lead users. This selection was based on the use of two self-assessment measures: Béji-bécheur and Gollety (2007) and Hoffman *et al.* (2010) (see Appendix 1). These one-dimensional scales were selected based on their satisfactory reliabilities and validities. Béji-Bécheur and Gollety's 4-item scale (2007) has been confirmed in both French and American contexts. The second scale comprises five items. We adapted these scales to a context of overall consumption of products and services. During a preliminary step, the scales were administered to identify lead users. We then selected those who scored highest.

We finally conducted sixteen in-depth interviews. The respondents' profiles and innovations are shown in Table 1. These phone interviews, lasting on average one hour, were conducted following a semi-structured set of questions (see Table 2). This allowed interviewers to deepen the understanding of motives at each step of the innovation process: ideation, prototyping and commercialization.

Table 1. Innovators profiles

[2] http://fnafi.wordpress.com/

Informants	Age	Gender	Initial product
Chantal	60	Female	A new clothes hanger
Christian	64	Male	Aqua Limpid: Sterilization system for swimming pool water
Dusan	58	Male	Nail positioner
Gérard	72	Male	The now ubiquitous car GPS (global positioning system)
Guy	77	Male	Babydor: Monitoring to prevent sudden infant death syndrome (SIDS)
Jean-François	72	Male	Furukoo: Several board games and an on line multiplayer game
Jean-Jacques	44	Male	Opening/closing systems for powder and liquid packaging
Jean-Louis	59	Male	Easy-brod: An easy to carry loom prevents back pain and eye strain
Jean-René	64	Male	Le Chauss'confort: System to lace up shoes
Michel	72	Male	Building materials for professionals (e.g. ladder with an innovative protection system)
Michel	66	Male	Special key to open a bottle of gas
Mohammed	28	Male	Clic-light: Signaling system, worn on a motorcyclist's back to increase visability for other drivers on the road
Pierre	66	Male	Tuyaucom: intercom between two motor-bikers
Raymond	63	Male	Vertical barbecue: remote control barbecue
Richard	58	Male	Le parasol heliotrope: A self re-positioning parasol which shelters the user from the sun throughout the day
Stéphane	41	Male	A decorative and multi-functional vase

Table 2. Lead user interview questions

halshs-00851319, version 1 - 13 Aug 2013

1. Can you introduce yourself in a nutshell?
2. Can you tell me the chronology of your innovating project starting from the idea?
    a. How did you come up with your new idea(s)?
    b. What was/were the origin(s) of the idea(s)?
    c. Was this innovation for you, your family or society in general?
3. How was the prototyping/design step?
    a. Did you receive some help? From your family, friends or member of a community?
    b. Have you filed a patent for your innovation?
4. Can you tell me in detail how and when you decided to start your own firm?
    a. Can you identify what drove that choice?
    b. Can you indicate the weight of each motivation to become an entrepreneur?
    c. What do you feel when thinking about people who use your innovation?
5. What place did this new activity take in your daily life?

Additionally, lead user motivations to become entrepreneurs were also documented using secondary data such as websites, photos, auto-biographies, meetings with members of the FNAFI…

The interviews were entirely recorded and transcribed. The coding and classification were managed separately by the authors. The data were analyzed using themes identified in the literature and themes that newly emerged in the context of our research. The results are developed in the following section.

3. Findings

We identify two types of motivations that drive some lead users to switch from an innovator role to an entrepreneur role: intrinsic and extrinsic motivations.

3.1 Intrinsic motivations

halshs-00851319, version 1 - 13 Aug 2013

halshs-00851319, version 1 - 13 Aug 2013

Regarding intrinsic factors (i.e. those factors that are directly related to the activity itself) that drive lead users to become user-entrepreneurs, six emerge from the corpus: *personal belief in the success of the project, personal desire to serve others, sense of pleasure, enjoyment, desire to take up a challenge and life project*. We develop these sub groups in the following sections.

a. ***Personal belief in the success of the project***

All of the respondents we spoke with were firmly convinced of the success of their innovation before its launch. They were all persuaded of the high-value and novelty of their product. Various verbatim texts support this idea with the use of superlatives such as “first-of-type”, “the only one”, *etc*… Their conviction concerning the usefulness and attractiveness of their innovations helped them believe in a wide distribution potential once their product was launched.

b. Personal desire to serve others

In many cases, the desire to help or protect others was directly linked to the willingness to market the innovation. Guy, for instance, developed and commercialized the “Babydor”, a monitoring system to prevent sudden infant death syndrome (SIDS) that he created after his neighbor lost a child to the syndrome. His motivation was to help parents and save lives. In the same vein, Jean-Louis decided to create a product to increase user comfort when weaving. His solution minimizes health problems related to this activity like back problems, eye strain or finger cramps. Other examples clearly illustrate a willingness to protect people whether they be on the road or on a roof.

c. ***Sense of pleasure***

For many of the interviewees, the pleasure derived from developing and selling their innovation was one of the most important motivations. The respondents’ reactions were all positive, indicating a combination of interest and curiosity surrounding this activity. These lead users were pleased to transmit their innovations and exchange with others about their products.

halshs-00851319, version 1 - 13 Aug 2013

d. *Enjoyment*

For the 16 respondents, emotional reactions were intense concerning their “adventure” as they often like to call it. In certain cases, they reported passionate reactions with a huge stimulation of the senses, sometimes verging on obsession. In addition, innovators expressed a feeling of self-fulfillment related to the transmission of their products to the market.

e. *Desire to take up a challenge*

In some cases, respondents explained that one of the reasons leading them to commercialize their innovations was closely related to their wish to surmount a challenge. This motivation was driven by the satisfaction derived from goal achievement. They felt that the balance between challenge and skills was in equilibrium.

f. Life project

Life project corresponds to the way respondents want to conduct their lives. Some of them indicated that their age was an important factor in the decision to become an entrepreneur. Certain respondents wanted to start their activity when they were “young”, whereas others wanted to start it later. Still others wanted to found their firm after retiring to limit risk and uncertainty.

3.2. Extrinsic motivations

Extrinsic motivations emerged from the data and propel lead users into entrepreneurial activities. These motivations are demonstrated by pecuniary motives, need for recognition from others, community resources and business opportunity identification. To support our empirical documentation, we will review each of these motivations in the subsequent paragraphs.

a. Pecuniary motives

Not surprisingly, our respondents mentioned motivations related to financial gain. Indeed, the desire to earn money and to experience large financial gain thanks to commercialization of their innovations was one of the main motivations lead users sited for embarking on

entrepreneurial undertakings. Closely related to these first findings, our data suggest that the desire for extra income and improved standard of living was an additional motivation for pursuing entrepreneurial activities. Covering costs generated by the innovative activity (prototype development, travel expenses, fair/tradeshow registration fees, *etc*.) and financing future innovative projects (current innovation changes, creation of new inventions, *etc*.) also provide an important impetus for seeking remuneration among user entrepreneurs.

b. The need for recognition from others

This non-pecuniary motive propelled lead users in entrepreneurial activities. For many of the respondents, this motivation was fueled by a desire for recognition from peers, family, friends and strangers.

c. Community resources

For the respondents, feedback, support (financial assistance, material help, equipment, legal advice) and encouragement from peers, friends and family was a valuable additional motivation for them even prior to firm formation, and encouraged the user entrepreneurs to further pursue their entrepreneurial activities.

d. Identification of business opportunities

Another source of motivation was identification of viable and feasible business opportunities. Lead users decided to found firms because they identified a sound opportunity or a small-scale niche market segment. They decided to build an idea and chose to diffuse it.

halshs-00851319, version 1 - 13 Aug 2013

halshs-00851319, version 1 - 13 Aug 2013

Table 3. Lead user motivations for undertaking entrepreneurship activities

	Motivation	***Definition***	***Examples (verbatim)***
Intrinsic Motivations	Personal belief in potential for project success	Certainty that the innovation will encounter market success and be diffused	*"… this is more certain when it's a great invention, it's normal that there will be compensation for its value. We cannot abandon it. I tell myself: I'm sure that this invention will be successful"* (Michel). "*This result is the expression of personal will, is obtained by will, that is to say, satisfaction of dissemination*" (Gérard).
	Personal desire to serve others	The need to help and protect others	"*Making my system resulted in saving lives. Today it's my goal. I'm vice-president of the Azur France Association of Motorcyclist Protection"* (Mohammed). "*At the beginning, my aim was to help users feel comfortable when using the loom, so comfortable that it is not pain, but rather the length of time that stops them. And the great satisfaction I have is that I bring happiness"* (Jean-Louis).
	Sense of pleasure	Pleasure felt by transmitting the innovation	*"That's a lot fun! My wife tells me that at the price I sell my innovation, I give it with pleasure. I am so glad when I see someone interested in my machine that I give reductions. I have already sold it at loss"* (Christian). *"Working when I want, it was for fun, yes"* (Pierre).
	Enjoyment	Intrinsic feeling combining stimulation of the senses and self-fulfillment	*"Innovators always dream of starting a firm, it is a collective dream, a company to develop several innovative projects. So it was "close to my heart for many years"* (Jean-Jacques). *"I share my passion, there are all these exchanges which are very*

halshs-00851319, version 1 - 13 Aug 2013

			important " (Jean-Louis). *" I always had a vocation to work in trade since I was born in the cauldron of trading"* (Stéphane).
	Desire to take up a challenge	Self-esteem derived when the challenge is met	"*The challenge was fun (…) it was the challenge of convincing them that I was able to do something other than developing opening systems for packaging*" (Jean-Jacques) " *It is a challenge for me (…) it was more an intellectual challenge*" (Richard)
	Life project	The way of looking at life in general	" *The younger you are, the more (likely) you will set up a business*" (Jean-Jacques). " *Given my career profile and my age, I was only 50 years old so I knew I still wanted to work* (after retiring)" (Jean-Louis)
Extrinsic Motivations	Monetary incentives	Desire to attain financial gains	"*It is certainly the first objective to earn money […] The first objective of every inventor: to make money with their inventions*" (Jean-François). "*In 2007, the economic crisis had befallen us and I said why don't I create my own company? The crisis motivated me to found my own firm. My income didn't melt away but salary, pension… we grew poorer […] with the crisis, I earn less*" (Christian). "*I told myself I should commercialize it to have an additional financial source […] by being an artisan, I am not rolling in money. We run after money, we have welfare costs.*" (Raymond)
	The need for recognition from others	Satisfaction derived from others' recognition	*"What motivates me is peoples' need, when you participate in invention fairs, people say your idea is great […] it is awesome, it is great"* (Doles).

halshs-00851319, version 1 - 13 Aug 2013

			"We have a lot of feedback, people say that it merits being commercialized, they give us advice […] friends say: "you have to commercialize it, it will be successful"" (Trotoux). *"First, I would like to prove myself […] it is a form of recognition from an economic standpoint, from corporate managers, investors"* (Marin).
	Community Resources	Support derived from others	*"We have a friend, he is a sound engineer who helped us in the process because he has a company, he gave us advice"* (Trotoux). *"There is an engineer who visited me and told me "listen, you have an awesome idea, you will have to give it a go, create your own company, commercialize your product […] I believe in it, it is fabulous […] since knowing this person, he has given me the opportunity to enter the road safety domain"* (Mohammed).
	Identification of business opportunities	Identification of small-scale niche market segments	*"There was no electronic system able to rival this […] I said: "here, there is an opportunity, here there is a niche, something happens on the market"* (Trotoux). *"I think that if I didn't undertake this process for my (gas bottle) key, it wouldn't exist. For my storm-water drain, it would be the same. If I didn't invest, make a prototype, do an invention show… this product would not exist"* (Michel).

halshs-00851319, version 1 - 13 Aug 2013

4. Discussion and implications

User-entrepreneurship is an extensive phenomenon which is still understudied (Shah and Tripsas, 2007). Based on 16 interviews conducted with lead users who found firms, we extend theoretically both lead user and user-entrepreneurship theories.

Theoritical and practical contributions

Our results suggest that intrinsic and extrinsic aspiration antecedents tend to universally drive lead users to found firms and become user-entrepreneurs. In contrast, the majority of previous studies in marketing and psychology show that these two types of motivations have different effects on individual behavior, specifically for creative tasks (e.g., Csikszentmihalyi, 1996; Deci and Ryan, 1985a; Deci and Ryan, 1985b; Deci *et al.*, 1999; Lepper *et al.*, 1973). Namely, it was found that extrinsic incentives (e.g. financial rewards) negatively affect intrinsic motivations.

However, a few studies have recently found that taken in combination, this coupling of motivations can produce a synergetic effect: extrinsic motivation can enhance intrinsic motivation which facilitates creative tasks (Eisenberger *et al.*, 1998; Burroughs *et al.*, 2011). In this research, one explanation supporting the facilitation of creative tasks may be that monetary incentives or the need for recognition (i.e. extrinsic incentives) increase lead user pleasure and enjoyment to commercialize and share innovations.

In addition, we also show a superior number of intrinsic motivation factors relative to extrinsic ones, confirming the importance of intrinsic motivation for effortful and complex tasks (Burroughs *et al.*, 2011).

Our findings also show that male entrepreneurs outnumber female entrepreneurs and they create bigger businesses. According to Shah and Tripsas (2007), this is not due to a lack of competence or ambition, but rather to the fact that women self-select into businesses that leverage their experience as users.

One practical suggestion resulting from our findings is that governments should consider reexamining and adapting the way they manage entrepreneurship to better leverage innovation by fostering supportive policies. We also recommend offering extrinsic rewards in combination with training for individuals identified as lead users.

Limitations and future research opportunities:

Our research has a number of limitations which open clear possibilities for future research opportunities.

A central limitation of our current survey is inherent in the sample population we examined. Our in-depth interviews were conducted with 3 professional-users and 12 end-users who became entrepreneurs. A good complementary study would be to conduct this same qualitative survey with two samples (end-user entrepreneurs and professional-user entrepreneurs) of equal size to better understand the motivations of these two categories of user entrepreneurs.

Moreover, the research reported here is composed of 15 men and only 1 woman. A further opportunity for research would be to "feminize" our sample population to determine if gender differences exist.

Furthermore, this qualitative survey focuses on a broad spectrum of sectors (enjoyment industries, road safety equipment, juvenile products, *etc*.). Replicating this research in a major industry (automobile, sports industries, *etc*.) could prove fruitful.

Our research focuses exclusively on physical products. It would be interesting to conduct additional research on other categories including services and digital goods.

Additionally, our study explores lead user motivations in founding for-profit entrepreneurial firms. A promising approach would be to explore why lead users contemplate free diffusion of their innovations or create non-profit organizations.

Finally, an empirical validation of the exploratory results would be welcome.

halshs-00851319, version 1 - 13 Aug 2013

Acknowledgments

We would like to gratefully thank all informants for their hearty participation in this research and fascinating conversations.

We would also like to address a special acknowledgment to Sarah Setton for her wonderful assistance in reviewing this manuscript in English and for her helpful comments and precious time.

References

Alba J.W. and Hutchinson J.W. (1987), Dimensions of Consumer Expertise, *Journal of Consumer Research*, 13, 411-454.

halshs-00851319, version 1 - 13 Aug 2013

Atuahene-Gima K. (1995), An exploratory analysis of the impact of market orientation on new product development performance, *Journal of Product Innovation Management*, 12, 4, 275-293.

Baldwin C., Hienerth C. and Von Hippel E. (2006), How user innovations become commercial products: a theoretical investigation and case study, *Research Policy*, 35, 9, 1291-1313.

Barczak G., Griffin A. and Kahn K. B. (2009), Perspective: trends and drivers of success in NPD practices: results of the 2003 PDMA best practices study, *Journal of Product Innovation Management*, 25, 3-23.

Béji-Bécheur A. and Gollety M. (2007), Lead user et leader d'opinion : deux cibles majeures au service de l'innovation (Lead user and opinion leader : two key targets for innovation), *Décisions Marketing*, 48, 21-34.

Burroughs J.E., Dahl D.W., Moreau C.P., Chattopadhyay A. and Gorn G.J. (2011), Facilitating and rewarding creativity during new product development, *Journal of Marketing*, 25, July, 53-67.

Chesbrough H. (2003), *Open innovation: the new imperative for creating and profiting from technology*, Boston: Harvard Business School Press.

Chesbrough H.W. and Crowther, A.K. (2006), Beyond high-tech: early adopters of Open Innovation in other industries, *R&D Management*, 36, 3, 229-236.

Csikszentmihalyi M. (1996), Creativity: Flow and the Psychology of Discovery and Invention. New York: HarperCollins.

Deci E. L. and Ryan R. M. (1985a), *Intrinsic motivation and self-determination in human behavior*. New York:Plenum.

Deci E. L., Koestner R. and Ryan R. M. (1999), A meta-analytic review of experiements examining the effects of extrinsic rewards on intrinsic motivation, *Psychological Bulletin*, 125, 627-668.

Deci E. L. and Ryan R. M. (1985b), The general causality orientations scale: self-determination in personality, *Journal of Research in Personality*, 19, 109-134.

Duncker K. (1945), On Problem-Solving, trans. Lynne S. Lees, *Psychological Monographs*, 58, 5 (Whole No.270).

Eisenberger R., Armeli S. and Pretz J. (1998), Can the Promise of Reward Increase Creativity?, *Journal of Personality and Social Psychology*, 74, 3, 704-714.

halshs-00851319, version 1 - 13 Aug 2013

Enkel E., Perez-Freije J., Gassmann O. (2005), Minimizing market risks through customer integration in new product development: learning from bad practice, *Creativity & Innovation Management*, 14, 4, 425-437.

Enos J.L. (1962), *Petroleum progress and profits: a history of process innovation*, M.I.T. Press: Cambridge, MA.

Franke N. and Shah S. (2003), How communities support innovative activities: an exploration of assistance and sharing among end-users, *Research policy*, 32, 157-178.

Franke N., Von Hippel E. and Schreier M. (2006), Finding Commercially Attractive User Innovations: A test of Lead-User Theory, *The Journal of Product Innovation Management*, 23, 301-315.

Franz K. (2005), *Tinkering: customers reinvent the early automobile*, University of Pennsylvania Press: Philadelphia, PA.

Freeman C. (1968), *Chemical process plant: innovation and the world market*, University of Pennsylvania Press: Philadelphia, PA.

Goldenberg J., Lehmann D.R. and Mazursky D. (2001), The idea itself and the circumstances of its emergence as predictors of new product success, *Management Sciences*, 47, 1, 69-84.

Haefliger S., Jaeger P. and Krogh G.V. (2010), Under the radar: industry entry by user entrepreneurs, *Research Policy*, 39, 10, 1198-1213.

Herstatt C., and Von Hippel E. (1992), From experience: developing new product concepts via the lead user method: a case study in a "low-tech" field, *Journal of Product Innovation Management*, 9, 3, 213-221.

Hienerth C. (2006), The commercialization of user innovation: the development of rodeo kayak industry, R&D Management, 36, 3, 273-294.

Hienerth C., Pötz M. and Von Hippel E. (2007), Exploring key characteristics of lead user workshop participants: Who contributes best to the generation of truly novel solutions?, *Proceedings of the DRUID Summer Conference 2007*, Copenhagen, Denmark, June.

Hoffman D.L., Kopalle P.K. and Novak T.P (2010), The « Right » Consumers for Better Concepts: Identifying Consumers High in in Emergent Nature to Develop New Product Concepts, *Journal of Marketing Research*, 47, 5, 854-865.

Jaworski B. and Kohli A.K. (1993), Market orientation: antecedents and consequences, *Journal of Marketing*, 57, 3, 53-70.

halshs-00851319, version 1 - 13 Aug 2013

Kratzer J. and Lettl C. (2009), Distinctive Roles of Lead Users and Opinion Leaders in the Social Networks of Schoolchildren, *Journal of Consumer Research*, 36, 4, 646-659.

Langlois R.N. and Robertson P.L. (1992), Networks and innovation in a modular system: lessons from the microcomputer and stereo component industries, *Research Policy*, 21, 4, 297-313.

Lepper M. R., Greene D. and Nisbett R. E. (1973), Undermining Children's Intrinsic Interest with Extrinsic Reward: A Test of the Overjustification Hypothesis, *Journal of Personality and Social Psychology*, 28, 1, 129–37.

Lettl C. (2005), Users as inventors and developers of radical innovation, *Journal of Customer Behaviour*, 4, 277-297

Lettl C., Herstatt C. and Gemuenden H.G. (2006), 'Users' contributions to radical innovation: evidence from four cases in the field of medical equipment technology, *R&D Management*, 36, 3, 251-272.

Lilien G.L., Morisson P.D., Searls K., Sonnack M. and Von Hippel E. (2002), Performance assessment of the lead user idea-generation process for new product development, *Management Science*, 48, 8, 1042-1059.

Lüthje C. (2003), Customers as co-inventors: an empirical analysis of the antecedents of customer-driven innovations in the field of medical equipment, Proceeding from the 32end EMAC Conference, UK: Glasgow.

Lüthje C. (2004), Characteristics of innovating users in a consumer goods field: an empirical study of sport-related product consumers, *Technovation*, 24, 9, 683-695.

Lüthje C. and Herstatt C. (2004), The lead user method: an outline of empirical findings and issues for future research, *R&D Management*, 34, 5, 553-68,

Lüthje C., Herstatt C., and Von Hippel E. (2005), User-innovators and "local" information: the case of mountain biking, *Research Policy*, 34, 6, 951-965.

Mansfield E. (1968), Industrial research and technological innovation: An econometric analysis. New York: W.W.Norton.

Mody C. (2006), Corporations, communities and instrumental communities: commercializing probe microscopy, 1981-1996. Working paper, Chemical Heritage Foundation: Philadelphia, PA.

Rogers E.M. (1994), Diffusion of innovation, 4th edition, New York: Free Press.

halshs-00851319, version 1 - 13 Aug 2013

Schreier M., Oberhaüser S. and Prügl R. (2007), Lead users and the adoption and diffusion of new products: Insights from two extreme sports communities, *Marketing Letters*, 18, 1-2, 15-30.

Schreier M. and Prügl R. (2008), Extending lead user theory: Antecedents and consequences of consumer lead userness, *Journal of Product Innovation Management*, 25, 4, 331-346.

Shah S.K. (2000), Sources and patterns of innovation in a consumer products field: innovations in Sporting Equipment, Massachusetts Institute of Technology, Sloan School Working Paper 4105, Cambridge, MA.

Shah S.K. (2003), *Community-based innovation and product development: findings from open source software and consumer sporting goods*, Doctoral Dissertation, M.I.T.: Cambridge MA.

Shah S.K. and Tripsas M. (2007), The accidental entrepreneur: the emergent and collective process of user entrepreneurship, *Strategic Entrepreneurship Journal*, 1, 123-140.

Shah S.K. and Tripsas M. (2012), When Do User Innovators Start Firms? A Theory of User Entrepreneurship, Revolutionizing Innovation: Users, Communities and Open Innovation, MIT Press, Cambridge, MA.

Shah S.K., Winston Smith S. and Reedy E.J. (2012), Who are User Entrepreneurs? Findings on Innovation, Founder Characteristics & Firm Characteristics, Kauffman Foundation Report, Kauffman Foundation, Kansas City, MO.

Spann M., Holger E., Skiera B. and Soll H. (2009), Identification of lead users for consumer products via virtual stock markets, *Journal of Product Innovation Management*, 26, 3, 322-355.

Tidd J., Bessant J. and Pavitt K. (2001), *Managing innovation: integrating technological, market and organizational change*, 2nd edition, Wiley.

Tripsas M. (2008), Customer preference discontinuities: a trigger for radical technological change, *Managerial and Decision Economics*, 29, 2-3, 79-93.

Urban G.L. and Von Hippel E. (1988), Lead users analyses for the development of new industrial products, *Management Science*, 34, 5, 569-582.

Utterback J.M. (1994), *Mastering the dynamics of innovation*, Harvard University Press: Cambridge, MA.

Von Hippel E. (1978), Successful industrial products from customer ideas: A Paradigm, Evidence and Implications, *Journal of Marketing*, 42, 1, 39-49.

Von Hippel E. (1986), Lead users: a source of novel product concepts, *Management Science*, 32, 7, 791-805.

Von Hippel E. (1988), *The sources of innovation*, Oxford University Press: New York.

Von Hippel E. (1994), Sticky information and the locus of problem solving: Implications for Innovation, *Management Science*, 40, 4, 429-439.

Von Hippel E., Franke N. and Prügl R. (2009), Pyramiding: Efficient search for rare subjects, *Research Policy*, 38, 1397-1406.

Von Hippel E., Thomke S. and Sonnack M. (1999), Creating Breakthroughs at 3M, *Harvard Business Review*, 77, 5, sept.-oct., 47-57.

halshs-00851319, version 1 - 13 Aug 2013

Appendix

Appendix 1: Final items for lead-user measures

Béji-bécheur and Gollety (2007)
I had expectations on the use of products or services long before others.
I have had ideas on how to improve products or services that have since been taken up by others.
Companies offer ideas that I have had for a long time.
My ideas are innovative compared to current practices.

Hoffman *et al.* (2010)
Other people consider me as “leading edge” with respect to products or services.
I have pioneered some new and different ways for products or services.
I have suggested to stores and delivery services some new products or services.
I have participated in offers by stores to use products or services in new and different ways.
I have come up with some new and different solutions to meet my needs for some products or services.