Managers aiming at utilizing the potential of involving ordinary users in ideation for innovation have at the present very little guidance from the existing literature regarding how to do this in an adequate way. This paper aims filling this knowledge gap by contributing to a better understanding of how users contribute to, and how they could adequately be managed in the ideation process of technology-based services. This is accomplished by identifying and investigating different ideation patterns and their effects on the created ideas’ characteristics, in the context of mobile telephony services. The paper is based on a quasi-experimental study lasting over twelve days involving 56 ordinary users and 12 professionals as idea creators. Three different groups of users and one reference group of professionals were used. The paper inductively identifies four different ideation patterns that lead to different types of ideas in regard to their innovativeness (incremental/radical). These are further related to the existing literature. The paper concludes with managerial implications regarding how to manage this type of user involvement in order to obtain either more incremental or more radical ideas.
Introduction

The service sector and its peculiarities concerning innovation have been increasingly pushed into the centre of economic policy and innovation management research (Djellal and Gallouj, 2001; Drejer, 2004; Gershuny, 1978; Miles, 1994; Sundbo, 1997; Tidd and Hull, 2003). The roles of innovation, technology and know-how in the context of economic development and technological change are here of growing interest and are widely discussed on different economic levels (Hipp and Grupp, 2005). In the more recent decades we have seen an increasing growth in technology-based services (Bitner, Brown, and Meuter, 2000; Dabholkar, 1996; Meuter et al., 2000), that is services based on technology and normally combining hardware (technology) and software. These services are, for example, embedded in our mobile phones, radio receivers, etc. They are consumed by man-machine-interaction. The underlying hardware is often rather standardized and fixed, whereas the services can be implemented by software in an almost infinite variety (Magnusson, In Press; Reid and de Brentani, 2004). Innovation in this context is often linked to increase user-value by providing services based on an existing, or an improved, technology platform. The knowledge regarding what brings value to the end users – ‘use knowledge’ – has its main locus among the end-users, whereas the knowledge regarding how to implement the services – ‘technological knowledge’ – is possessed by the professional developers (experts) in the developing firm. The ‘use knowledge’ and ‘technological knowledge’ need to be combined in order to attain innovation.

Traditional marketing methods are oriented towards trying to understand the ‘use knowledge’ by different modes of interrogation. There are, however, alternatives namely to let the users do the innovations themselves and try to stimulate the users’ creativity. Another method is to search for innovations already developed by so-called ‘lead users’ (von Hippel, 1986). Lead users are regarded to be in possession of both, ‘use knowledge’ and ‘technological knowledge’, and - combined with a strong motivation to innovate for their own benefit – being excellent innovators. Lead users have for long been recognized as valuable contributors of new ideas for innovation of new products (e.g. Franke and Shah, 2003; von Hippel, 1977, 1986).
There are, however, problems, mainly to identify lead users and engage them. For business-to-consumer (B2C) markets there is also the problem of knowing whether lead users are representative for the vast majority of the future market (Mahajan, Muller, and Srivastava, 1990; Martinez, Polo, and Flavián, 1998; Rogers, 1962). This brings us to exploring the potential of ‘ordinary users’, i.e. users that do not have any in-depth knowledge of the underlying technical system. Recently it has been advocated that ordinary users can give valuable contributions in the ideation process (Kristensson and Magnusson, 2005; Magnusson, Matthing, and Kristensson, 2003). There are, however, rather few studies investigating how different ways of involving users in the ideation process affect the quality of the created ideas. Most studies conclude that user involvement is positive, but the understanding of the ideation process on a micro level is a rather uninvestigated area (Dahl and Moreau, 2002; Moreau et al., 2005). However, Kristensson and Magnusson (2005) found that users’ technical knowledge of the underlying system was negatively related to their ability to produce original, technology-based service ideas. Furthermore, from more psychological research it has been found that ‘priming’ of the users has a decisive effect on the creativity of the outcome. However, managers aiming at utilizing the potential of user involvement for ideation have at the present very little guidance regarding how to do this in an adequate way.

This paper aims filling this knowledge gap by contributing to a better understanding of how users contribute to the ideation process of technology-based services. This is accomplished by investigating different ideation processes and their effects on the created ideas’ characteristics, in the context of mobile telephony services. We further investigate if the chosen ideation process or pattern is affected by the way the user is involved in the ideation process. More explicitly the research questions can be formulated as:

i) What different ‘ideation patterns’ can be identified among ordinary users involved in an ideation process?

ii) How does the ideation pattern, followed by the ordinary users, affect the quality of the created ideas?
iii) Is there any dependency between the strategy for involving ordinary users in the ideation process and ideation pattern they adopt?

The remainder of this paper is organized as follows. In the next section, the theoretical background is described. This section includes a discussion of the role of innovation and technology in service industries discussing the balance between incremental and radical innovation. Furthermore there is a review of creativity and ideation research regarding differences between experts and novices, and different ideation patterns. The third section of the article describes the quasi-experimental methodology of the empirical study. The fourth section presents the results and analyses, including the findings with respect to examining the research questions. The fifth section discusses the findings of the study, including a discussion structured around the research questions. The article ends with some concluding managerial implications.

Theoretical background

Role of innovation and technology in service industries

In much of the traditional literature on innovation, services are neglected because of the low technology-intensity and the inability to develop or to use technological innovations for products and processes (Pavitt, 1984). More recent studies, however, underline the interdependencies between the technical-economic paradigm in manufacturing and in particular services. Gallouj and Gallouj (1997) identify five different relations between services and technologies: 1) substitution relation (replacing human capital by technical capital); 2) identity relation (consubstantiality between tool and services, e.g. electronic mailing); 3) determination relation (technological innovation determines the emergence of new service functions); 4) diffusion relation (services help to diffuse technological innovations); and 5) production relation (services produce technological innovations). Especially the identity relation, the determination relation and the production relation are of importance in technology-based service companies like telecommunication services.
Companies producing and operating technology-based services are important agents in the development of new knowledge; they assist – among others - in the widening of use knowledge, as their interaction with customers and users leads to better understanding and adoption of new services as well as the underlying technology (technological knowledge). Due to their “boundary-spanning” role and their ability to create new and combine existing knowledge, technology-based services play a significant role as creative knowledge-generator and -broker in the innovation system of companies, industries, and nations (Hipp, 1999).

The nature of innovation in services

Traditional innovation literature often classifies innovations according to their grade of innovativeness. Often two types are used to distinguish this, e.g. incremental/radical, continuous/discontinuous, etc (e.g. Crawford and Di Benedetto, 2000; Tidd, Bessant, and Pavitt, 2005). Garcia and Calantone (2002) mean that these dichotomies are often ill defined and too binary. They therefore introduce the term ‘really new’ which is in between. Callahan and Lasry (2004) prefer the term ‘very new’ instead. The rational behind the division is that both types are necessary for a company. The incremental have a lower risk and better short term profitability, whereas the radical are more risky but are aiming for the future (Tushman and O’Reilly III, 1996).

Sundbo (1997) discusses the difference between radical and incremental services innovation in detail and concludes that, because service innovations are easily copied, a continuous innovation process is necessary, which in turn affects the initiation of radical innovations. In order to cope with continuous innovation it should not be the innovativeness that is prioritized, but rather different innovation paces for service innovation based on use knowledge and innovations based on the underlying technical system. Consequently, for technology-based services both incremental, short-term oriented and more radical, long-term and technology-based innovations should be of interest for the company. However, special attention is necessary to match the interfaces between new service applications and the underlying (existing or improved) technical platform.
Creativity among experts and novices

In many fields experts are shown to be able to recognize, store and retrieve meaningful information faster and qualitatively better than novices (Chi, Glaser, and Farr, 1988). Thus, experts generally solve problems more effectively than novices due to their well-structured and easily activated domain knowledge. However, in new product/service development, the requirement for more radically new products may require a very broad search for solutions, i.e. a solution that may reside outside the search space (the domain) where experts have their advantage. If novices are using a much broader and unexpected search strategy, novices may come up with ideas that are considered more creative and better than the experts’. In a study by Wiley (1998) this scenario was the case and experts was at disadvantage when they performed several creative problem solving tasks.

An important theoretical advancement regarding human mental reasoning capabilities concern commonalities in how individuals function when they are engaged in a creative problem solving. Commonly, prior knowledge plays an important role in structuring novel ideas when they are generated and the more prior (primed) knowledge one has, the less novel becomes the created solutions (Marsh, Ward, and Landau, 1999). Of interest here is the notion that prior knowledge is activated automatically and requires no intention. When an individual identifies that a certain type of prior knowledge will be useable in for a certain problem this prior knowledge acts as a stimulus that activates a set of predetermined response tendencies of which the individual will be unconscious about. Unconscious responses like this are generally referred to as ‘priming’ (Bargh and Chen, 1996).

More specifically, there are two findings that explain this situation (and appear interesting in light of the research questions posed in this article). First, Marsh, Landau and Hicks (1996) discovered that ideas generated by individuals’ conform to examples that they have been showed before they were engaged in a creative problem solving, i.e. participants reduced their creative performance by thinking in a convergent manner. From a theoretical stand point-of-view people seem to take a path of least resistance by retrieving existing solutions or information that seem
probable to immediately contribute to a future solution (Ward, 1994). One reason for mental shortcuts like this may be that creative problem solving is considered as a mentally very demanding task. Thus, in order to maximize creativity it seems better to not have too much prior knowledge or easily retrieved examples at hand. This conclusion is supported by Dahl and Moreau (2002) who reports from an experiment where participants who received closely related analogies performed worse than participants who received distant or far analogies. Secondly, in a follow up study Marsh (1999) showed that people use prior knowledge inadvertently when they are generating creative solutions. This means, that once people have been showed examples, have required some type of information that may be related to the problem in questions or possess prior knowledge, they cannot avoid the usage of this information or knowledge – i.e. they are being caught to search for solutions within a predefined box.

**Ideation patterns**

Goldenberg, Lehmann and Mazursky (2001) maintain that the marketing literature has paid little attention to the way ideas are generated, in our paper named ‘ideation pattern’; nevertheless research has shown that the ideation pattern affect the qualities of ideas. Drawing on previous research (Finke, Ward, and Smith, 1992; Smith, Ward, and Finke, 1995) Goldenberg et al. (ibid) propose that ideas are composed of ‘functions’, and ‘forms’. Functions are related to consumer needs, whereas forms are solutions to the user needs. Function and form are thus related to two type of knowledge ‘use knowledge’ (function), and ‘technological knowledge’ (form). Depending on the genesis of the idea they classify different patterns: (1) need spotting – need identification precedes the solution development (form); (2) solution spotting – identification of a technology and the inventor search for meaningful user applications; (3) mental invention – represents the cases where need and solutions are identified concurrently. In addition to these three, they also name two more market research for new products, and following a trend, these can in our mind be regarded as variants of (1) and (2) above.
**Method**

**Research design**

To investigate the research questions a comparative quasi experimental design of involving users in the ideation phase was used. Four different ideation conditions (user involvement strategies) were conducted; three different user conditions and one control condition using professional developers. The task for all conditions was to derive service ideas for an existing service platform for mobile telephony services. All conditions lasted for twelve days where the participants were equipped with mobile phones prepared with eleven sample services that illustrated the potential of the available services platform. In total 354 ideas were collected and assessed in three dimensions (originality, user-value, and producibility).

**Participants**

The first condition, ‘professionals’, consisted of 12 professional service developers all recruited from Telia Mobile (Sweden’s largest mobile telephony operator). All of them came from an R&D unit responsible for developing new non-voice mobile services, i.e. services based on SMS, WAP, GPRS and suchlike. Their professional experience in the field varied between 1 and 10 years. The other three conditions consisted of ordinary users who were volunteering students from the Karlstad University. All participants were students in non-technical study programs, e.g. social science, teacher training, business administration, etc. The main reason for choosing students was that they represent one of the most frequent SMS user-groups, thus representing users in general and an target customer group of great interest for mobile service providers. The students were randomly divided into the three conditions.

Condition two, ‘ordinary users’ (19 persons) managed idea creation by themselves, while the third condition (20 persons) consulted service development experts during two controlled meetings. Group three will henceforth be referred to as ‘consulting users’. The last group, ’creative ordinary users’ (17 persons), had before entering the trial participated in a university course were they
practiced different creativity techniques, e.g. Brainstorming, Slipwriting, Random input, Six thinking hats to name but a few.

There were no significant differences between the four conditions regarding any of the background variables – age, experience of mobile telephony, and SMS usage. Neither were there any significant differences regarding the three personality tests: (i) FS-test, a Swedish test, correlates to a person’s creativity (Holmquist and Ekvall, 1986); (ii) LOT (Life Orientation Test) indicates whether a person has a positive or negative disposition, (Scheier and Carver, 1985), and (iii) TR (Technology Readiness), indicates a person’s willingness to adopt new technology. (Parasuraman, 2000). The groups’ scores, including descriptive data, are shown in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Pro-fessionals (N=12)</th>
<th>Ordinary Users (N=19)</th>
<th>Consulting Users (N=20)</th>
<th>Creative Ordinary Users (N=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS-test M</td>
<td>5.92</td>
<td>6.37</td>
<td>4.55</td>
<td>5.76</td>
</tr>
<tr>
<td>SD</td>
<td>1.56</td>
<td>1.77</td>
<td>1.23</td>
<td>1.86</td>
</tr>
<tr>
<td>LOT M</td>
<td>23.08</td>
<td>24.53</td>
<td>23.50</td>
<td>23.47</td>
</tr>
<tr>
<td>SD</td>
<td>3.70</td>
<td>4.34</td>
<td>3.75</td>
<td>5.04</td>
</tr>
<tr>
<td>TR M</td>
<td>8.00</td>
<td>5.79</td>
<td>4.65</td>
<td>1.88</td>
</tr>
<tr>
<td>SD</td>
<td>4.11</td>
<td>5.92</td>
<td>4.97</td>
<td>6.06</td>
</tr>
<tr>
<td>Age M</td>
<td>36.50</td>
<td>23.79</td>
<td>22.10</td>
<td>27.53</td>
</tr>
<tr>
<td>SD</td>
<td>8.13</td>
<td>2.18</td>
<td>2.02</td>
<td>9.07</td>
</tr>
<tr>
<td>Gender Females 2 (17%)</td>
<td>4 (21%)</td>
<td>8 (40%)</td>
<td>9 (53%)</td>
<td></td>
</tr>
<tr>
<td>Males 10 (83%) 15 (79%)</td>
<td>12 (60%)</td>
<td>8 (47%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mob. tele. experience (years) M</td>
<td>10.42</td>
<td>3.60</td>
<td>3.88</td>
<td>4.32</td>
</tr>
<tr>
<td>SD</td>
<td>6.04</td>
<td>2.33</td>
<td>2.50</td>
<td>3.28</td>
</tr>
</tbody>
</table>

**Dependent variables**

The literature mentions numerous criteria that can be used in order to evaluate the ‘quality’ of an idea; however, there are no uniformly accepted criteria (Balachandra and Friar, 1997; Cooper, 1993), and it would seem that criteria should be chosen according to the context (Hart et al., 2003; Hauser and Zettelmeyer, 1997; Tzokas, Hultink, and Hart, 2004). The lack of established criteria for assessing ideas for products and services reflects the fact that an idea can be perceived as the ‘most innovative’, or the ‘easiest to use’, or the ‘cheapest to implement’, and so on. In the ultimate, what is judged most ‘important’ depends on the business context; this will in turn decide whether
emphasis should be on more incremental, or more radical ideas. To enable a comparison of ideas (i.e. dependent variable) without taking different business contexts into account, the present study derived criteria that were product specific, irrespective of context. This was achieved using a focus group of five experts from Telia Mobile who were experienced in assessing mobile telephony services. Following a discussion of the intrinsic factors that differentiate successful mobile telephony services from less successful services, the participants individually and collectively suggested the following three dimensions: (i) originality, the newness of the service idea; (ii) user value, the value from the user’s perspective; and (iii) producibility the ease with which the service can be produced thus taking the producer’s perspective. It should be noted that the first two criteria corresponds to the definition of creativity (see e.g. Amabile 1996) which supports the validity of our three dependent variables.

Procedure

The experimental procedure consisted of four stages: (i) initiation; (ii) idea creation; (iii) delivery; and (iv) evaluation. Each trial lasted for twelve days.

Initiation stage. In the initiation stage, participants were given an assignment to create one or more ideas for SMS-based services. Users were asked for proposals for new services that would be of value to them, whereas the professionals were asked for proposals that would of use to the participating users; all groups thus had the same target group for their ideas (students at the university).

Participants were free to collaborate if they wished; if so, the co-creators were noted. The ideas were expected to include at least one new service idea that utilized the existing application platform (AP), which was essentially a converter between SMS messages and http calls on the Internet; that is, the AP enabled access to information on the Internet by sending and receiving SMSs.

To give the participants a sense of how these services worked and to provide inspiration, users were given access to a sample of about ten implemented services (sample services). They were also
equipped with a mobile phone with a pre-paid card allowing approximately 150 SMSs. All participants received hands-on training in how to use the phone by testing the sample services.

**Idea-creation stage.** The idea-creation stage of the study lasted for 12 days. The only condition having any interaction with the researchers was the ‘consulting ordinary’. The other conditions managed the creation process without assistance. Each participant was given a diary (notebook) in which they were instructed to document the ideas that came up, as well as the activities that triggered the idea creation. The diary data could be used for gaining a deeper understanding of the individual idea creation process, but could also be used for triangulation, i.e. making explicit the factors that influenced the creation of the ideas and solutions.

**Delivery stage.** After the 12 days of idea-creation, each group was gathered together and the ideas were delivered in a predefined format together with the diaries. All participants were also interviewed within the next two weeks, the interview being semi-structured in nature. The interviews were tape-recorded and transcribed into print. The purpose of the interviews was to trace relevant process data, such as important incidents that made the participants come up with especially good ideas. Accordingly, much of the time during the interview was used for discussing how the submitted service ideas had been triggered.

**Evaluation stage.** The Consensual Assessment Technique (CAT) (Amabile, 1996) was used in the evaluation stage. Six experts, all of whom were experienced in evaluating service ideas for mobile communications, independently assessed the service ideas. Three of the judges were engineers employed in the R&D department of Telia Mobile. All three had more than five years of experience from assessing mobile services; all three were engineers employed at the R&D department. The other three judges had a mix of technical and marketing experience outside Telia Mobile.

The ideas were ranked on a scale of one to ten on all three dimensions—originality, user value, and producibility (see Dependent variables)—with a score of one representing the least
original, least valuable, and hardest to produce, and a score of ten indicating the most original, most valuable, and easiest to produce.

A test round was conducted to calibrate the judges’ assessments. In this test, five ideas were chosen for individual assessment by the judges, followed by a discussion of the results among the judges. If any individual assessment was found to differ markedly from the others, this was discussed and anomalies in judgment were addressed. After completion of this test round, the service ideas of the participants were formally evaluated. Each assessment was made individually, and no discussions were allowed among the judges.

Analysis and Results

Identification of different ‘ideation patterns’

All 354 ideas were first analyzed to identify possible ideation patterns using an inductive approach. The basis for the analysis was to investigate to what extent the participants utilized the available sample services in their ideation process. This resulted in the identification of four different typical ideation patterns: (i) ‘Improvement’ is an improvement of one of the available sample services. The intention is to make a slight improvement of the efficiency or add some minor function. For instance, one of the sample services was an electronic live bus timetable. Several suggestions were proposing improvements of this. (ii) ‘Context translation’, ideas where it is traceable that one of the sample services was the trigger for proposing the same type of application in a new context, i.e. extending the application context. An example of this is the previously mentioned bus timetable that was proposed to be translated into a train timetable. Both previously described ideation patterns did thus originate from one of the sample service’s functions, i.e. a type of priming. Another type of priming was also found among the ideas. These were cases where the participants adopted an existing application outside the sample services (often web-based), and proposed that is should be implemented on the application platform; we name this ideation pattern (iii) ‘application adoption’. The fourth and final ideation pattern we call, (iv) ‘unprimed application’, a disruptive idea which
cannot be traced to neither any of the sample services nor any other pre-existing service. These ideas seem to have “popped-up” during some creative instance during the trial period, and being either the solution to an encountered problem or a spotted opportunity. The distribution of ideation patterns are presented in Table 2.

<table>
<thead>
<tr>
<th>Ideation pattern</th>
<th>Improvement</th>
<th>Context</th>
<th>Application</th>
<th>Unprimed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionals</td>
<td>7</td>
<td>4</td>
<td>32</td>
<td>12</td>
<td>55</td>
</tr>
<tr>
<td>Users</td>
<td>46</td>
<td>35</td>
<td>125</td>
<td>93</td>
<td>299</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>39</td>
<td>157</td>
<td>105</td>
<td>354</td>
</tr>
</tbody>
</table>

**Table 2**

Distribution of Ideation Patterns

*Ideation pattern’s effect on the characteristics created ideas*

To investigate the characteristics of the idea and whether they can be classified as more radical or incremental two different indexes, based on the three evaluated dimensions, were computed as proposed by Magnusson (In Press). For the operationalization the following formula was used:

\[
\text{Type of innovation} \leftrightarrow (\alpha \ast \text{Originality}, \beta \ast \text{Producibility}, \gamma \ast \text{User value})
\]

The coefficients \(\alpha\), \(\beta\), and \(\gamma\) were determined according to the type of innovation (incremental or radical). For *incremental* innovations, ‘producibility’ and ‘user value’ are most important (that is, the service should be both easy to implement and valuable), whereas ‘originality’ is (by definition) low. For more *radical* ideas, ‘originality’ is the most important factor, at the cost of ‘producibility’; ‘user value’ is not unimportant, but this dimension can be accorded a lower weighting (compared to an incremental innovation) because the actual user value can be rather difficult to establish in the idea stage of a new original idea. On the basis of this rationale, the following values were assigned to the coefficients for the two types of innovation:

**Incremental_index** \(\leftrightarrow 0.475 \ast \text{producibility} + 0.475 \ast \text{user value} + 0.05 \ast \text{originality} \)

**Radical_index** \(\leftrightarrow 0.10 \ast \text{producibility} + 0.35 \ast \text{user value} + 0.55 \ast \text{originality} \)
The two indexes were used to analyze if the different ideation pattern lead to more radical or more incremental ideas. A one-way ANOVA for the four ideation patterns yields significant differences regarding both incremental_index ($F_{3,350}=13.805$, $p<.001$), and radical_index ($F_{3,350}=23.150$, $p<.001$). Scheffé’s (Scheffé, 1959) post hoc multiple comparison test was used to investigate significant differences between the groups; the results are shown in Table X. In accordance with the recommendation of Scheffé, the significance level ($\alpha$) was set to .01 (Scheffé, 1959, page 71).

<table>
<thead>
<tr>
<th>Table 3: Comparison of innovation indexes between ideation patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Radical_index:</td>
</tr>
<tr>
<td>Improvement</td>
</tr>
<tr>
<td>Context translation</td>
</tr>
<tr>
<td>Application adoption</td>
</tr>
<tr>
<td>Unprimed application</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Incremental_index:</td>
</tr>
<tr>
<td>Improvement</td>
</tr>
<tr>
<td>Context translation</td>
</tr>
<tr>
<td>Application adoption</td>
</tr>
<tr>
<td>Unprimed application</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
The ‘unprimed application’ pattern scored best for the radical_index, and was significantly better than both ‘application adoption’ and ‘improvement’. Although better than the ‘context translation’ the difference between the two was not significant. A third significant difference was found, namely that ‘context translation’ scored better than ‘application adoption’.

For the incremental_index, it was instead the ideation pattern ‘improvement’ that dominated by being significantly better than all three other ideation patterns. Further, the ‘application adoption’ was significantly better than the ‘context translation’. Of practical interest is of course how managers can guide the participants to adopt the desired ideation pattern. This issue is addressed in the third research question.

**Dependency between user involvement strategy and ideation patterns**

It should be noted that the groups had not been instructed to adopt any specific type of innovation pattern. Anyhow, the groups adopted different patterns depending on the involvement strategy used, see Table 5.
As seen from Table 5, several significant differences could be identified in the cross tabulation. The professionals showed a tendency to prefer the ‘application adoption’ ideation pattern. A similar behavior could be observed for the ‘consulting users’ group. Both these groups thus identified existing applications and suggested these to be adopted.

The ordinary users on the other hand seemed to was rather primed by the available sample services and there ideation pattern was relatively to the other groups dominated by the ‘improvement’ pattern.

The ‘creativity trained users’ had two dominant ideation behaviors, namely ‘unprimed application’ and ‘context translation’. The first pattern is actually the only pattern that is totally unbound from any priming of existing applications.

**Discussion**

**Different idea patterns**

The four identified ideation pattern do conform to a large extent to the ones proposed in the literature (Finke, Ward, and Smith, 1992; Goldenberg, Lehmann, and Mazursky, 2001). An
important contribution with this study is that the ideation process was performed in a natural yet controlled setting, and not in a laboratory as the case for most other studies. Two of the patterns were directly primed (i.e. automatically influenced without intention) by one sample service (an existing solution) and triggered either an improvement process or a context translation process. This is thus an extension of the ‘solution spotting’ discussed by Goldenberg et al. (2001). From an innovation perspective this extension is relevant, as improvement can be regarded as a type of customization suggestion whereas context translation is a type of analogical thinking process, where the “inventor” is stimulated by a sample service into imaging new use contexts. For the ‘application adoption’ pattern the participants seemed instead to be primed by an idea outside the sample services which they thought would be useful for themselves and proposed an adoption of the service to the technical platform at hand; this pattern can be regarded as a type of ‘need spotting’ (Goldenberg, Lehmann, and Mazursky, 2001). In the fourth ideation pattern no direct priming effects can be found in the sense that it is neither a need spotting nor solution spotting process. It can however be presumed that the participants were indirectly affected by the sample services’ opportunities in a way that stimulated their creativity to come up with ideas that were not directly primed to the samples.

**Different patterns leads to different types of innovation**

The different ideation patterns seem to be better suited for different types of innovation. To obtain more radical ideas, it was preferable to adopt an ideation pattern of type ‘unprimed application’ or alternatively ‘context translation’. Common for both these patterns are that they are aiming at new applications compared to the sample services, the inventor thus need to create, or activate, new use knowledge.

To obtain more incremental ideas the ‘improvement’ or ‘application adoption’ patterns seems most suitable. Common for both these is that the ideation is based on an already known application which is either improved, or transformed into a new technical platform.
It should be noted that both types of innovations, as previously concluded, are beneficial to the innovating firm. This implies that a firm should try and stimulate the involving users into a variety of ideation patterns. The problem is, however, for managers to guide the involved users into a certain ideation pattern. The present study does indeed contribute to a better understanding regarding how to actually tune the involved users towards either producing more radical or more incremental ideas. Investigating the three user involvement strategies, and the control condition (professionals) showed a dependency between involvement strategy and adopted ideation pattern. The reasons for this are intriguing.

**Propensity of adopting a certain ideation pattern**

Both the ‘professionals’ and the ‘consulting ordinary users’ had a propensity to use the ‘application adoption’ pattern. The behavior is comprehensible for the professionals as these have a limited understanding of the ‘use knowledge’, i.e. what kind, non-existing, applications that might be of interest for the target group. A safe way to come up with service ideas is therefore to focus on existing applications and hope that it will be successful also for a new platform. This is of course not necessarily true, as the interface of a mobile phone has totally different characteristics than those of a PC for instance. Further, if for instance a web application is adapted for a mobile phone it will likely not utilize the “mobility” of the mobile phone. The consulting users’ behavior is, however, harder to understand. These ought to understand what type of applications the users would desire. Anyhow, they were locked into a similar ideation behavior as the professionals. It could actually be that the closer interaction (two face-to-face meetings during twelve days) between these users and the professionals induced this behavior.

Notable is also the fundamental difference in ideation patterns between the ‘ordinary’ and ‘creative ordinary’ users. The ‘ordinary’ adopted an ‘improvement’ ideation pattern whereas the ‘creative ordinary’ had a propensity for ‘unprimed application’ and ‘context translation’. It should be reminded that the main difference between the groups was the creativity training course that the latter group had received. A plausible explanation for the ‘creativity trained users’ adoption of
ideation pattern may be that they did not enter their creative process by considering what had previously been invented or what already existed, thereby they avoided being trapped in being limited by prior knowledge. In terms of theory, their search patterns seemed to lie outside of what would be the traditional search space and there were no easily retrieved paths of least resistance (Ward, 1994; Wiley, 1998). In their creativity training one important feature had been to use totally unrelated events and features and try to connect these to the problem in questions, i.e. their reasoning used a divergent thinking approach where their task was to (for example) combine essential features of a hotel visit with mobile phone services. Compare this approach with a more traditional one where individuals would be more likely to start their reasoning by considering already existing mobile phone services and try to improve them directly. Naturally, it is difficult to be totally free from prior knowledge which explains that some ideas from this group also showed an innovation pattern of ‘context translation’.

To conclude, although none of the groups were explicitly instructed how to perform the ideation procedure they did adopt different ideation patterns. This is an important finding as it can be utilised to actually manage the involved users towards a specific ideation pattern.

**Conclusions and managerial implications**

The present study has provided useful insights and practical guidance for managers with respect to the involvement of ordinary users in idea generation for technology-based services. The study finds that different ideation patterns have a propensity to give either more incremental or more radical ideas. If the objective is to obtain more incremental ideas, managers should consider the users to adopt an ideation pattern of type ‘improvement’ or ‘context translation’. A direct way to obtain this would be to present sample services, or prototypes, and explicitly ask the users to actually come up with improvements or find an analogous use.

On the other hand, if the company is aiming for more radical innovation, the ‘unprimed application’ pattern seems most preferable. In this case the firm should instruct the participants to
actually think more freely in order to not be stuck, primed by the sample services. It seems that to obtain this it might preferable to actually have some kind of creativity training for the participants.

Under all circumstances, should an ideation pattern based on application adoption, be avoided when involving ordinary users for ideation. This will minimize the creative outcome, and can moreover be done by the professionals without involving any users in the process.

References


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