Toolkits for Idea Competitions: A Novel Method to Integrate Users in New Product Development

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Research has shown that many innovations originate not in the manufacturer but the user domain. Internet-based Toolkits for Idea Competitions (TIC) are a novel way for manufacturers to access innovative ideas and solutions from users. Idea competitions build on the nature of competition as a means to encourage users to participate at an open innovation process, to inspire their creativity, and to increase the quality of the submissions. When the contest ends, submissions are evaluated by an expert panel. Users whose submissions score highest receive an award from the manufacturer, which is often granted in exchange for the right to exploit the solution in its domain. Following the idea of evolutionary prototyping, we developed a TIC in cooperation with a manufacturer of sports goods. The TIC was launched as a pilot in one of the company's markets. Submissions were evaluated using the consensual assessment technique. The evaluation of this study provides suggestions for further research, but also implications for managers willing to explore TIC in their organization.

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1. Introduction

To acquire information from (potential) customers about their preferences, requirements, and needs is routinely stressed as a prerequisite for successful new product development (NPD) (Katila and Ahuja, 2002; Urban, 2005; von Zedtwitz and Gassmann, 2002). The dominating measure to access this information is market research. But although sometimes enormous amounts are spend for market research, new product success is often the exception rather than the rule – even if highly sophisticated conjoint measurements or concept testing are performed (Henkel and von Hippel, 2005). Regularly, market research delivers not much more than heterogeneous trends. Besides problems of conducting market research in a proper way (Burke, 1996), it has been shown that the transfer from need information from customers to a manufacturer is often costly and difficult because this information tends to be *sticky*. Stickiness is defined as the incremental expenditure required for transferring a certain unit of information to a specified locus in a form that is usable to the information seeker (von Hippel, 1994; Ogawa, 1998). High information stickiness may be due to the attributes of the information itself, such as the way information is encoded (Nelson 1982; Rosenberg 1982). Alternatively, it can be due to attributes of information seekers and providers. For example, a particular information seeker may be able to acquire information only in a restricted manner because of a lack of certain tools – a lack of "absorptive capacity" (Cohen and Levinthal, 1990). For both of these interconnected reasons, users' need-related information is frequently highly sticky, which means that the information called upon by product developers can only be transferred at high costs. As a result, NPD managers tend to rely on assumptions about the market preferences or just to perform a revision of existing products.

Another limitation of many NPD processes is that manufacturers tend to see the innovation process as internal ("closed") activity (Chesbrough, 2003). They transfer customer requirement (need) information in a possible solution by using just the solution knowledge (technologies, materials, methods, processes) that is in their domain and that is known to them. As a result, the solution space is reduced to sources known to the firm. But in many cases, much more ideas, technologies, and applications may exist outside the manufacturer's borders. Recent literature thus demands to find new ways of opening the innovation process to the input of external sources (see, e.g., Chesbrough, 2003; Quinn, 2000; von Hippel, 2005; von Zedtwitz and Gassmann, 2002). The idea is that by incorporating a much larger variety of

ideas and knowledge in NPD, the performance of this process should improve and the resulting products should have a better fit with the market requirements. In this paper, we focus on one of the most important actors in a distributed (open) innovation process: *customers and users*. Research has shown that many inventions originate not from the manufacturer domain, but from the user (von Hippel, 1988). The term *user innovation* refers to an innovation where users have performed a substantial part of the problem solving process leading to a solution. Accordingly, a *"user"* is an actor who expects to profit from an innovation by consuming or using it, while a *"manufacturer"* expects to profit from selling or licensing an innovation (von Hippel, 2005).

The *objective of our paper* is to discuss a novel way for manufacturers to organize such a user innovation process: internet-based *toolkits for idea competitions (TIC)*. While this method has been successfully used in some companies, only little research documents the design and implementation of user competitions as a method to facilitate customer integration in NPD (Ernst and Gulati, 2003). New internet technologies allow today for a broad and continuous application of this method. Our research is based on piloting and evaluating a TIC at *Adidas Salomon AG,* a DAX 30 company from the sports goods industry headquartered in Herzogenaurach, Germany. The introduction of a TIC in one of its division was the first initiative of this company towards user integration in NPD. Thus, our research is *exploratory*. It aims to generate more underlying insights into the implementation, mode of operation, and performance of a TIC. In the next section, we take stock of what we know about user innovation. We will also build a conceptual understanding of the TIC method and discuss how different forms of these toolkits can be structured. Section three describes our research setting, method of data collecting, and the results of a pilot study of TIC implementation. Our paper ends with implications for managers willing to explore TICs in their organization and some suggestions for further research.

This paper contributes to the literature by addressing the novel and relevant question how a firm can proactively enable and motivate customer participation in NPD, and what challenges and management tasks may result from this activity. This question is relevant for many companies operating in volatile markets where firm success is very much depended from managing NPD efficiently and effectively. Our research is novel as we take the perspective of a manufacturing firm organizing customer integration in NPD by the means of a toolkit for idea competitions (TIC), a new way to utilize customer input for innovation. We find empirical support from an exploratory pilot study that a TIC is a feasible way to supplement existing practices in NPD.

2. Literature review: User innovation and toolkits for idea competitions

Literature has emphasized since decades that users take an important role in NPD. Contrary to the dominating pattern in many firms just to listen to their customers, these researchers find that some users do not only express new needs but become active by their own. They are motivated by a need not fulfilled to their satisfaction by the recent offerings in a market, and start own problem solving activities to create a solution satisfying this need. For example, Rosenberg (1976) found that in the machine tool industry many new developments were initiated by users and not the machine tool providers. Von Hippel and co-authors have identified users as originators of major innovations in many industries, including scientific instruments (von Hippel 1976), semiconductors (Urban and von Hippel, 1988), pipe hanger hardware (Herstatt and von Hippel, 1992), or pharmaceuticals (DeMonaco *et al.*, 2005). Users are also innovators in consumer goods markets like mountain biking (Lüthje, 2003), windsurfing (Franke and Shah, 2003), or household goods (Ogawa and Piller, 2006). Recently, open source software development has been explored as a major model of user innovation (Lakhani and Wolf, 2005; Weber, 2004).

2.1 Organization of user innovation by the manufacturer

In most of the literature on user innovation, the perspective is on users motivated by their own impetus, and performing their problem solving activities autonomously and without any involvement of a manufacturer. It is then the task of the manufacturer to capture these ideas and transfer them into innovations of its own. But there is also a new view that manufacturers are organizing and facilitating the process of user innovation (Jeppesen and Molin, 2003; Nambisan, 2002; Ogawa and Piller, 2006; Prahalad and Ramaswamy, 2004). This perspective contrasts with earlier accounts of solitary and more disconnected users who innovate. By taking a firm perspective, we focus in the following on interactions between a manufacturer and its users in an innovation process that is initiated by the manufacturer, taking advantage of a technological milieu (foremost the internet) to create an arena where user innovation can evolve.

User innovation, however, has to be seen as a *supplementary means* to support the NPD process, and not as a substitute for conventional internal practices. Not all ideas and inputs coming from users are contributing to successful new products per se. Bower and Christensen (1995) have argued that manufacturers should not listen to their present customers as these

may show a tendency of repeating old procedures rather than looking for radical innovation. This may be true for the majority of a firm's users just following the mass. But there are also a (small) number of users with a set of distinctive characteristics differentiating them from the majority of users. These *"lead users"* are organizations or individuals who (1) face needs that will become general in a marketplace much earlier before the bulk of that marketplace encounters them; and (2) are positioned to benefit significantly by obtaining a solution to those needs (von Hippel, 1986; Lilien *et al.*, 2002; Lüthje and Herstatt, 2004). More specifically, lead users in consumer goods markets (which is the area of our empirical research) are innovative and trendsetting consumers in the respective product field (Lüthje, 2003). They regularly adopt new products earlier than the common consumer and also actively communicate experiences with a new product in their social network. They are dissatisfied with the way how existing products fulfill their needs, but as they possess a high degree of product-related information, they are able to come up with ideas how to improve an existing offering or with a solution for a functional new product.

Manufacturers striving to profit from lead user input have to identify these users. The literature has developed several methods how to screen and identify them (see von Hippel *et al.*, 2005, for a review). They can be differentiated in *screening* methods (identifying lead users from a population by looking for specific characteristics), *pyramiding* methods (asking a known innovative user to recommend suitable peers), and *self selection* (offering lead users a measure so that they can identify themselves to the manufacturer and prove their lead user abilities). While most of the existing research has focused on comparing screening and pyramiding (Morrison *et al.*, 2004; von Hippel *et al.*, 2005), we will explore in the following a new way for self selection.

2.2 Toolkits for idea competitions (TIC)

The main driver of a broad integration of user input into NPD is the *internet*. It has enabled larger groups of users to access information that was formerly almost exclusive to firms, to participate in the exchange of ideas (e.g., in online communities), and to share their own developments with others. Better access to information also motivates users to create a solution when existing offerings do not fit their needs. For manufacturers, internet technology facilitates a direct and rich interaction with their customers, bypassing intermediaries such as retailers or market research firms (Nambisan, 2002; Sawhney *et al.*, 2005). This is where the

idea of *toolkits for user innovation and co-design* originates. Toolkits shift development and design tasks from the locus of the manufacturer to the user (Franke and Piller, 2003, 2004; Thomke and von Hippel, 2002; von Hippel and Katz, 2002). Their application lowers the efforts and costs for users to co-create by supporting problem-solving activities and to share the results with others. Two types of toolkits can be differentiated:

- Some toolkits focus on getting *access to need information*. They facilitate the creation process by providing users the solution capabilities of a manufacturer. Instead of asking individual users what they want, these toolkits allow users (i) to design a novel product by trial-and-error experimentation (within the given solution space) and (ii) to receive an immediate (simulated) feedback on the potential outcome of their design. These toolkits basically transfer R&D capabilities which used to be in the hand of internal experts to the users (e.g. toolkits for developing application-specific integrated circuits for industrial users; Thomke and von Hippel, 2002). As users create within a given solution space of a manufacturer, a user design can often be produced fast and efficiently by the manufacturer.

- A second type for toolkits focuses on getting *access to solution information* and more generic innovative ideas in the user domain. These toolkits do not equip users with explicit capabilities to develop a solution by their own, but encourage them to think about a problem and to transfer an idea for a solution to the manufacturer. These toolkits provide first of all a purposive platform for communication and interaction. However, they go beyond just establishing an "open line" like a vanity number or special e-mail address where users can report innovative ideas. They also support feedback and learning-by-doing, but do so in a more open and less structured way compared to toolkits of the first type.

A core challenge for manufacturers when opening the innovation process is *how to incentivize users* to transfer their innovative ideas. For users of the first type of toolkits, the main motivator is the capability of the manufacturer to directly produce the individual solution for them (Franke and Piller, 2004). But in the second case, this motivation does not hold as strong as information provided here is often more general, includes solution information and ideas for process improvements, and the individual user will benefit only much later (if at all) from her contribution. Some companies thus promise cash rewards or licensing contracts for

innovative ideas, other build on non-monetary acknowledgments promising peer or company (brand) recognition and facilitating a pride-of-authorship effect.

Obviously, these rewards or recognitions are not given to everyone submitting an idea, but only for the "best" of these submissions. This leads to the idea of using a competitive mechanism as an explicit measure to foster and encourage user innovation. Economists have argued since the beginning of their discipline that it is *competition between economic actors* that drives economic progress (Smith, 1776). Accordingly, the idea of *toolkits for idea competitions* (TIC) is to ask a group of (competing) users to submit solutions to a given task within a given timeframe. The nature of a competition should encourage more or better users to participate, should inspire their creativity and increase the quality of the submissions (Hayek, 1948; Toubia, 2005). Submissions are evaluated by a panel of members from the solution seeker, and ranked accordingly to a set of evaluation criteria. Contributors whose submissions score highest receive an award from the seeker, which is often granted in exchange for the right to exploit the solution in the domain of the seeker. Intuitively, winning contributors should show lead user characteristics, making such a toolkit also a *measure for self selection of lead users* (identified users could be integrated in NPD by means of subsequent lead user workshops).

Previous examples of user idea competitions show a broad scope of application (these examples have been identified during the first stage of our research as described in Section 3.1). They can be structured along two continuums, as shown in Figure 1:

- *Task specificity* addresses the openness of the seeker's problem. If task specificity is high, seekers are looking for a solution for a precisely formulated problem. A good example provides *MathWorks* (www.mathworks.com/contest). The company asks for a solution of a highly specific mathematical problem and demands that users use a special software and representation of the solution. Or consider *Innocentive*. This company seeks for its clients, manufacturers from process industries, solutions for very specific scientific problems, for example a molecule meeting specific characteristics. It broadcasts this problem into its community of more than 80,000 international scientists, screens the submissions, and selects the best fitting solution. On the other side of this continuum is *P&G's YET2.com* idea competition. It asks continuously for any contribution that could provide interesting new technologies for one of the many divisions of P&G.

- The *degree of elaboration* addresses the quality and kind of user input the manufacturer is seeking for. P&G's *YET2.com* asks for ideas along very open problems, but demands that the solution is highly elaborated and proven by a working prototype. Stepping further down on this continuum is *Threadless.com*, a company entirely based on a continuous user contest where winning designs (for t-shirts) are transferred into mass products (Ogawa and Piller, 2006). Threadless demands some degree of elaboration for the submissions by requesting the usage of specific software that allows for an easy transfer of the chosen designs to manufacturing. The theme of the designs (task specificity) however is not defined at all. *Salomon Snowboards* is organizing an annual competition looking for new (aesthetic) snowboard designs (www.artworkcontest.com). But contrary to Threadless, users do not need to consider if and how a design could be printed easily on a board.

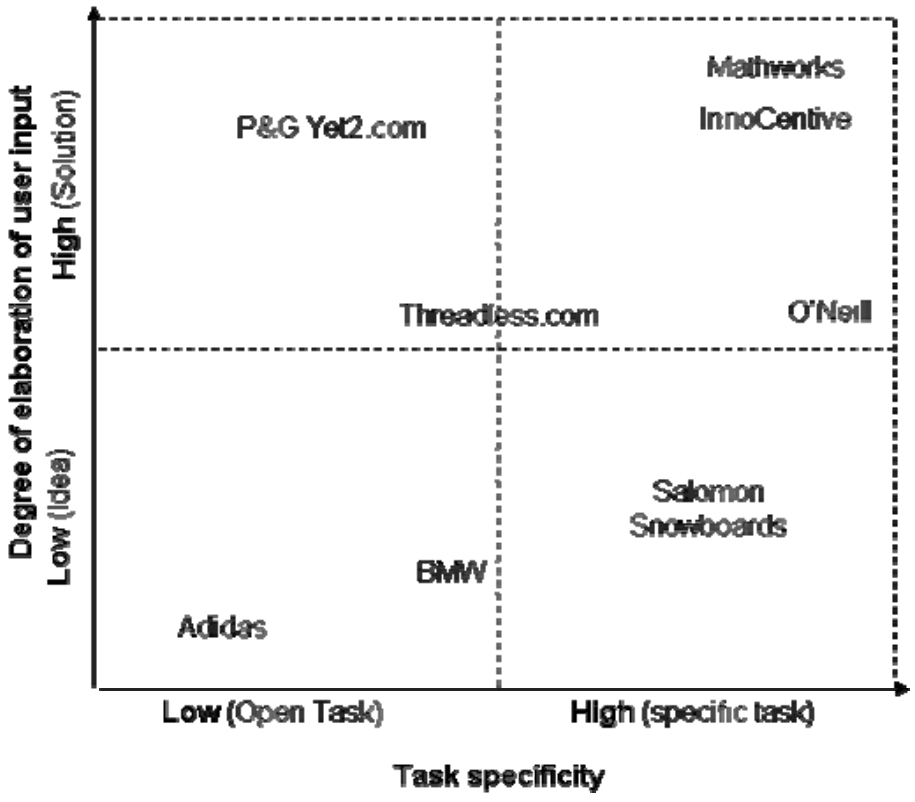

Figure 1: Mapping user idea competitions.

Further examples of TIC include *BMW's* initiative to include users in NPD of new telematics services for their cars (navigation, in care entertainment, security services, etc.). Users were asked for functional novel ideas for corresponding products in the future (www.bmw.de). Sports shoe manufacturer *O'Neill* operates a pilot where users can use a configuration toolkit to design their own sneakers (www.oneill-action.com/designyour-sneaker.php). Contrarily to similar offerings from Nike or Timberland, however, the custom designs are not mass customized for each user designer, but serve as input for the corporate designers to find new styles and products. The task specificity of this idea competition is very high, and the outcome is of rather high elaboration as the creative process is reduced to the selection of color options for given elements of a shoe.

3. Methods and data

While idea competitions sound like a familiar method to get access to input from external actors, we could find only very limited research that has studied these competitions in the context of NPD (Ernst and Gulati, 2003, Toubia, 2005). Further, many user competitions appear to be just an instrument of the marketing department to deepen the relationship between customers and the brand. Hence, the objective of our research was to explore the design and implementation of a TIC as a *method for NPD* and to evaluate its performance, i.e. the kind and quality of ideas generated with this method.

3.1 Research process

To reach this objective, we initiated a pilot study in cooperation with *Adidas Salomon AG*, the world's second largest manufacturer of sports goods (Adidas in the following). Our research team has a long history of collaboration with this company, following an action research approach (Argyris and Schön, 1978; Gummesson, 2000) of strong interaction and even job rotation between the university research team and the company's innovation management group since 1998 (Berger *et al.*, 2005). The project documented in this paper was part of this collaboration and followed three stages:

- *Exploration:* Exploratory interviews were conducted with core members of Adidas' NPD teams in order to generate an understanding of present practices of integrating customer input in NPD. In addition, we conducted interviews with experts on user innovation from

academia and practitioners who had run such a competition in other companies. Interviewees were identified by a pyramiding approach (Bijker, 1995). Interviews were conducted face-to-face, transcribed, and evaluated according to suggestions by Yin (1994) and the example of Homburg, Workman and Jensen's (2000) study of change in customer-focused organizations.

- *Prototyping and piloting:* Following the idea of evolutionary prototyping (Jörgensen, 1984), we developed a TIC for one of Adidas' divisions. After a pre-test with 50 users recruited from students and own research staff, and feedback evaluation by the expert group mentioned in the previous step, the TIC was launched as a pilot. A group of actual customers (n=136) used the TIC from June to December 2004.

- *Evaluation:* The user ideas were evaluated by a company expert panel following the rules of the Consensual Assessment Technique (CAT) by Amabile (1982, 1996).

3.2 Research setting: The Adidas TIC

The starting point for this research was the NPD process of Adidas' 'Performance' division which is responsible for about 80 percent the company's worldwide sales. Due to industry consolidation and new market entrants from the fashion industry, Adidas continuously has to find a way to outperform its competitors. Also, customers are increasingly demanding exceptional design and product performance. Product innovation is therefore the top strategic objective of the company. Each season, the company launches several thousands of new products and product variations. Given the emphasis in the innovation management literature on integrating customer input in the innovation process, we expected to find at least some of these methods in use at Adidas – especially when considering the company's brand consciousness and marketing power. But our interviews revealed that input from users is used only rudimentarily and not collected in an organized manner. Most products are based on a revision of the existing assortment and feedback from Adidas' international subsidiaries and distribution partners. Lead user testing is performed by some of the professional athletes sponsored by Adidas. But from an overall perspective, the Adidas innovation process can be regarded as a typical example of a closed innovation system.

The decision to open its innovation process and to explore how customer input could contribute to NPD was triggered by two events: First, management recognized that other large

German companies (Audi, BMW) and one of their core competitors (Nike) were experimenting with toolkits for user innovation. They were further inspired by the experience of Salomon, an affiliated company during the time of our research, organizing an annual design competition as described already in Section 2.2. After discussions with the research team, Adidas' management decided to pilot a tool for customer integration in NPD. The TIC was jointly conceptualized by the research team and Adidas (coding and graphic design was outsourced to a multimedia company), building on earlier research on the design of toolkits for user innovation (Füller *et al.*, 2004; Nambisan, 2002; von Hippel and Katz, 2002). Its development addressed the following requirements:

- *Inspire creativity:* The creation process spanned the total customer experience with the company. Structured in twelve zones, users could generate and evaluate ideas for, e.g., the pre-sales phase, the sales process, the usage phase, but also with regard to additional services Adidas should offer in the future (see Figure 2). To support and foster creativity, several techniques were applied to enrich the users' imagination. For instance, different future scenarios or some vague drafted solutions were presented as catalysts of brainstorming for new ideas. In addition, users had the possibility to return to a previous design stage in order to modify their input ("trial and error"-learning).

- *Community functionality:* The benefit of interactions in communities is that its members can take up, enhance or just comment on new product ideas and work on them collaboratively (Franke and Shah, 2003; Nemiro, 2001; Sawhney and Prandelli 2000). Accordingly, cross-evaluation of user ideas was one of the central features of the toolkit. Users could add comments to other contributions. Comments could be a pure annotation, but also an innovative continuation of the existing idea.

- *Increase efficiency:* The toolkit allowed for evaluating and clustering user input automatically and represented the user feedback in such a way that rather less human editing work was required. Of course, the ideas had to be read and evaluated by the expert panel once the competition had ended, but grouping and clustering of these ideas was automated.

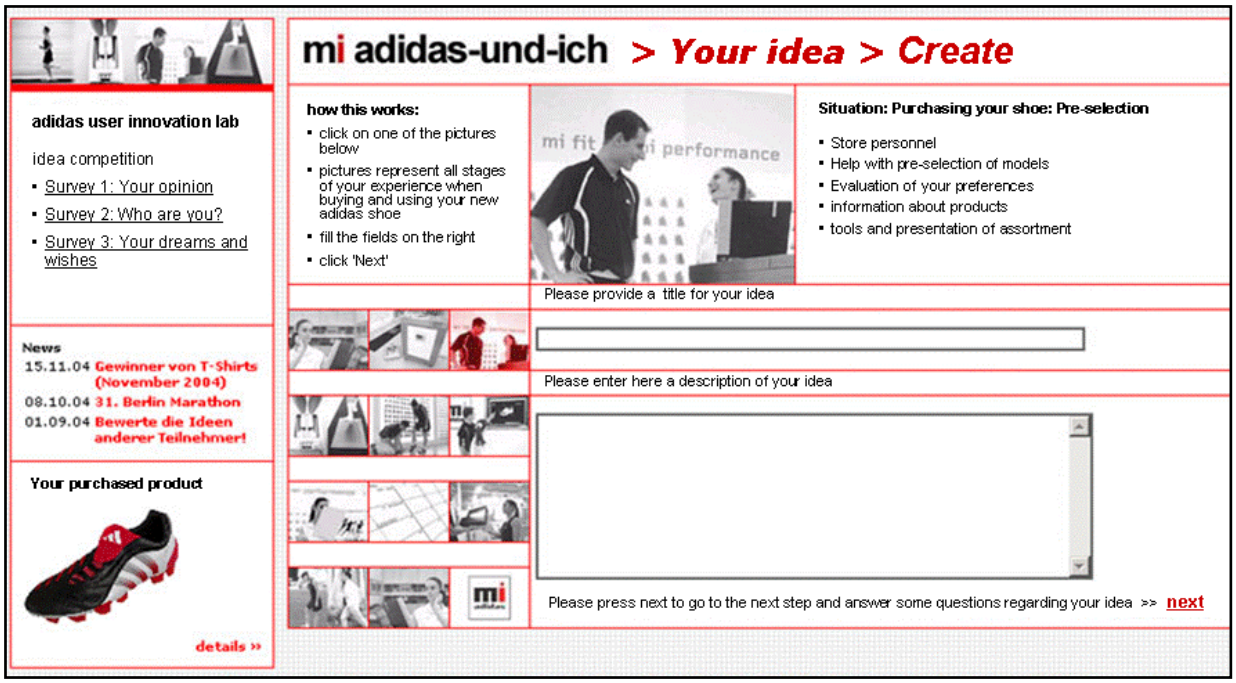

Figure 2: Exemplary screenshot of the Adidas TIC.

3.3 Data and sample

The TIC was piloted with customers of selected Adidas products. The products were top-of-the-line sports shoes which are purchased primarily for exercise and performing competitive sports. We hypothesized that their customers were better able to develop and submit an innovative idea and also more willing to reveal their ideas compared to customers of more basic products, as they might have a higher product and application knowledge (Lüthje, 2003). Customers were randomly selected at the point of sales (in selected stores) and asked to participate in the project. Customers willing to participate received a personal access code to the project's website. There, on a welcome page, users were addressed personally and a clickable picture of their purchased shoe was provided (due to the character of a competition, anonymity of subjects was not an issue).

Users had to accept a legal disclaimer (granting all property rights of the submissions to Adidas). The incentive mechanism of this TIC followed the idea that the fun and challenge of participating, peer recognition, brand involvement, and awareness of the company would be the major factors motivating users to contribute (Lakhani and Wolf, 2005; Schreier, 2006). To increase participation, a sweepstake of ten tickets for premier-league soccer matches was drawn among all users. The contest was open from June to December 2004 (6 months). The

authors of the three "most innovative" submissions were invited to visit the corporate headquarters and got a 250 Euro voucher for Adidas' products.

During the piloting period, 774 customers were invited to participate, and 136 visited the TIC website (17.6% response rate). Of those users, 57 actively participated in the idea competition (41.9% of responding customers) by contributing 82 submissions. 93 (of the 136) users participated in scoring and commenting contributions of other users (482 evaluations and 97 continuative comments). The additional comments and user evaluations were a helpful measure in a later stage of the project when the implementation of selected ideas was discussed. Evaluations and feedback from other users helped also the ideas' originators to refine their ideas during the course of the contest in order to raise the overall quality of the submissions. In the following, we will use the 82 idea submissions for our evaluation.

4. Results

We were surprised by the rather high willingness of customers to participate. This may be the result of the pre-selection (high involvement product categories), but is also an indicator for the general applicability of an internet-based user design competition. In the end, however, not quantity but quality of submissions is crucial for the method's success. We measured performance of user contributions with the *consensual assessment technique* (CAT), developed by Amabile (1982, 1996). CAT basically is a generic measure for *creativity*, but has been successfully applied to evaluate the innovativeness of a product or response in situations where functional measures like technical performance are not available (Collins, 1992; Conti *et al.*, 1995). Hence, CAT seems to be an adequate method to evaluate user submissions in idea competitions characterized by low task specificity and open requirements with regard to the elaboration of the submission (lower left field of the TIC structure in *Figure 1*). The Adidas TIC is exactly positioned in this field.

CAT originates from Amabile's analysis of empirical studies of creative behavior. She found that while a consistent definition of "being creative" does not exist and many persons have a different understanding of creativity, the same persons still tend to evaluate the same criteria as "creative". Amabile thus developed a technique based on the subjective assessments of experts (appropriate observers) to measure whether a product or response is creative or not. A product or response is creative to the extent that appropriate observers independently agree it

is (Amabile, 1996). Appropriate observers (judges) are those highly familiar with the domain in which the product was created or the response was articulated. The number of jury members should be between three and ten. For our project, we recruited an interfunctional group of five experienced Adidas managers (innovation, product management, communication) from different hierarchies in the organization.

The CAT construct of creativity consists of several dimensions which were proven to be reliable and valid in previous studies. Dimensions include the *novelty* or *originality* of a submission, its *usefulness (utility)*, and the *level of elaboration* of the submitted idea (Amabile, 1996; Amabile *et al.*, 1997). Usefulness was differentiated in our study in two scales, *expected customer benefits* and *number of expected beneficiaries* of the idea. All dimensions were measured on a 7-point-Likert scale reaching from 0 (no value) to 6 (highest value). CAT is characterized by the requirement that only the dimensions should be presented to the evaluators, but no further explanations should be given. All judgements are expected to be based on the experts' own comprehension of the dimensions. Amabile (1996: 74) asks evaluators to "use your own subjective definition of creativity, rate the degree to which the idea is creative relative to the others." Accordingly, evaluators are not allowed to discuss their judgments during the evaluation phase to prevent biases due to group dynamics, social acceptability, or their hierarchical status. Experts are further not allowed to ask any questions during the evaluation process to avoid any bias caused by additional information. Respectively, the research team is not allowed to give any biasing instructions. To fulfil this requirement, experts evaluated the ideas at the same time, but in different rooms.

After all evaluations were collected from the expert panel, the *consensus of the evaluations* was measured. Consensual assessment indicates the quality of the evaluation. If consensus is high, the evaluation can be seen as reliable and valid. Previous literature suggests to measure consensus with the *Intraclass-Correlation-Coefficient* (ICC) (McGraw and Wong, 1996; Shrout and Fleiss, 1979), which builds on Pearson's correlation coefficient. ICC values above 0.7 indicate a high degree of consensus. In our study, the ICC for all dimensions was beyond this threshold (Table 1). Combining all scores of all five experts in regard to one idea, an *overall score* could be calculated for each idea. As all dimensions were weighted equally, this combined score has a value between 0 and 120 (5x4x6). Calculating this score for all ideas provided us with a ranking of all ideas. The best ranked submission scored 107, the minimum score was 51. Ideas were arranged within 5-point intervals as shown in Figure 3. The chart

indicates that the creativity distribution of all ideas follows a Gaussian distribution (*Kolmogorov-Smirnov test*, p= .456). A few contributions (10%) were evaluated as only marginal creative. They were classified as *comments*. The majority (80%) of the contributions can be seen as suggestions for *improvements* concerning the current offerings of Adidas. They are building on existing products, but do not radically expand the company's solution space. Ten percent of the ideas, however, were evaluated as radical *new ideas*, bearing the potential to expand respectively change Adidas' business spectrum (for the obvious reason of trade secrets, we cannot reveal these ideas here).

Table 1: ICC values for the creativity measures used to evaluate users' ideas.

Originality	Customer benefit	Number of beneficiaries	Level of elaboration
0.81	0.79	0.74	0.80

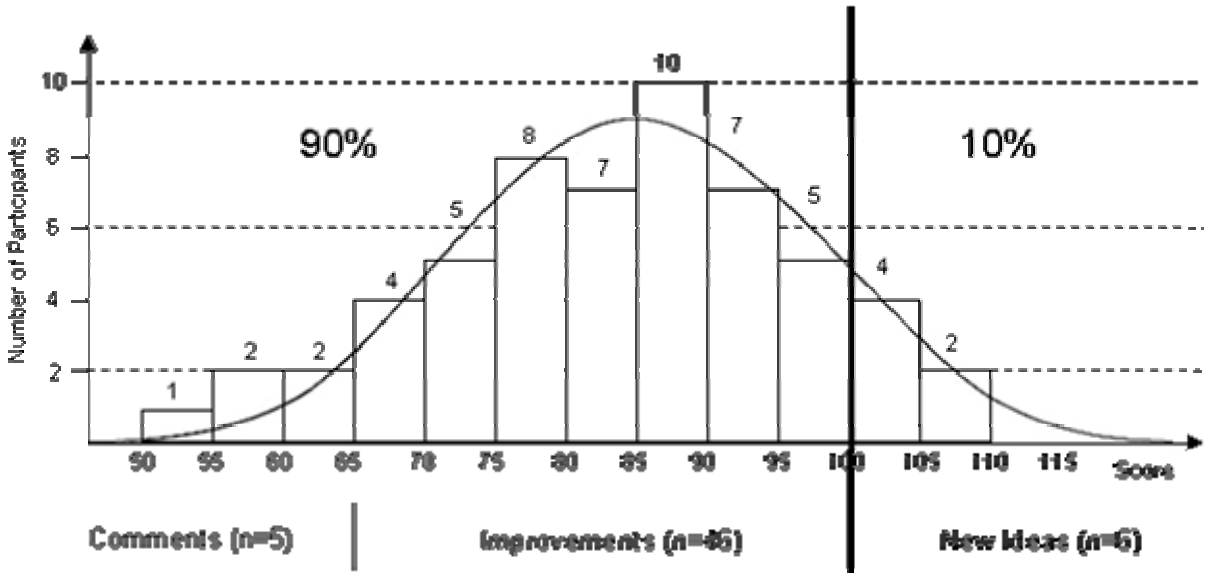

Figure 3: Number of ideas per creativity-score interval.

5. Discussion

Adidas' management was very satisfied with the quality of the submissions in general, and rather enthusiastic about the winning ideas. Two of them are presently in the state of implementation. Winning users were invited to participate at subsequent (conventional) lead user workshops, generating even more innovative output. Overall, the willingness of customers to participate was surprisingly high. This could be explained by high involvement, brand awareness, and demand for peer recognition by the participating users (this research on user motivations cannot be covered here due to space restrictions). For Adidas, a continuous implementation of a TIC could thus become a tool supporting NPD while deepening the relationship with its customers at the same time – a marketer's dream.

But to open the internal NPD process continuously for user input, Adidas – as most other organizations – has to establish more formal organizational structures supporting this practice. From discussions with Adidas' management we conclude that internal change management and cross-functional acceptance to make user innovation a permanent part of NPD will strongly influence the long-term success of this initiative and its scalability. An open innovation system consists not only of platforms like toolkits for user innovation, but demands adequate organizational values, norms, and rules (Prahalad and Ramaswamy, 2004; Ramirez, 1999). The NPD organization has to increase its ability to access, value, and utilize external resources (user input). Otherwise, a new kind of “not-invented-here” (NIH) syndrome (Katz and Allen, 1988) may prevent that user contributions are exploited by the NPD team (Biemans, 1991).

Another point demanding further consideration from management and researchers alike is TIC usability. Research has only recently begun to study usability and interaction methods of conventional toolkits for user innovation and co-design (Franke and Piller, 2004; Füller *et al.*, 2004). The performance of an idea competition may be significantly influenced by the design of the TIC's user interface, the procedure of idea formulation, features for collaborative idea creation, and so on. This includes also the development of methods for pre-screening the ideas when submission numbers go beyond a few hundreds and reach thousands of contributions. Such a method could be modeled on the practices of Japanese firms to screen large numbers of suggestions from their employees as part of a continuous improvement program (Reinmöller, 2002). Toubia and Flores (2005) suggest to include also users in the idea

screening process. In a field experiment, they find that there are some fundamental differences between consumer and expert evaluations of ideas. In particular, experts appear more sensitive to “solution information” and consumers more sensitive to “need information”. As a result, product concepts based on expert-screened ideas are likely to be more sophisticated, but may not address consumer needs better than concepts based on consumer-screened ideas. This finding provides an important input for further research.

Further, our study explored the capabilities of idea competitions as a supplementary means to identify lead users by screening or pyramiding. Idea competitions are often faster and less expensive compared to *screening* lead users from a large sample, which demands the development of a context specific scale and measurement instrument and surveying potential participants. Also *pyramiding* is a rather laborious process, demanding intensive face communication activities. The application of a TIC, however, works with rather limited costs once the toolkits has been implemented in the company. But, most importantly at all, the lead user identification process is just a by-product of a larger objective: the immediate generation of innovative ideas. We also assume that idea competitions perform the lead user selection process with a higher quality. Both screening and pyramiding identify lead users as the result of *ex-ante* assumptions about the potential user participants. The real capability of these users can only be evaluated after a lead user workshop took place. On the contrary, idea competitions are based on a two stage selection process and perform lead user selection *ex-post*: First, potential users show their motivation and perceived capability to contribute to the innovation process by their sheer participation at the idea competition (*self-selection*). In ex-ante selection, this behaviour is subject of assumptions about the behaviour of users, measured by multiple screening scales. Second, the quality of their submissions is a direct indicator of their innovativeness and application or product knowledge. So these users have already shown that they bear lead user characteristics in regard to the specific company context. This makes them ideal participants for further activities of customer engagement in product innovation by the manufacturer.

Our study, however, has some limitations which can become starting points for further exploration and research: While the TIC supported self selection of lead users efficiently, it was limited by the way how the sample was drawn. Participation was limited to customers of specific (rather expensive) Adidas shoes in selected retail outlets. This excluded not only those customers without the willingness-to-pay for these shoes, but also users of other

footwear brands. Providing open access to the TIC (e.g., by placing it openly on the website) would increase the scope and scale of participants and in return the possibility to generate more creative ideas. Further research could also replicate the selection process by other lead user identification mechanisms (for example, perform an initial screening of users, and then invite identified users to participate in an idea competition).

Another limitation is the use of CAT to evaluate the quality of user submissions. Our evaluation board was selected according to the requirements stated by Amabile (1996). But it did not include external experts. Evaluators from the organization initiating the competition may be biased by company culture or existing structures – another mutation of the NIH problem. It would have been insightful to include external experts and analyze the effects on the consensus of the evaluations (ICC measurement). Company policy however prevented this inclusion of external evaluators. Further exploration of the design and operation of toolkits for idea competitions should provide more insights into different forms of evaluating the ideas. Despite these limitations, our findings suggest that toolkits for idea competitions are a capable response to the difficulties and uncertainties that today are faced by many new product development initiatives.

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