Integrating the customer in the innovation process is believed to be a powerful means to reduce failure rates and to increase the revenue from new products. Although many companies have launched programs to enable such integration, the understanding of the mechanisms behind successful programs remains limited. Furthermore, the benefit of integrating customers in the innovation process has to be weighed against the costs. Virtual customer integration has been discussed as a way to limit these costs and bring the benefits of potentially unlimited scalability.

Using a sample of the Euro Stoxx 50 companies, we shed light on the various types of virtual customer integration platforms, their limitations, their benefits and the mechanisms that have to be put in place to make them succeed. Results indicate that only a limited number of platforms go beyond the sourcing of ideas. Especially the integration of the customer in the execution phase of the innovation process remains largely limited to digital goods.

Keywords: Virtual customer integration, customer-active paradigm, innovation management, lead user.

1 Introduction

The integration of customers into the innovation process is an important way to reduce uncertainty (Ernst 2002). The position of the customer has successively changed over the last 30 years from a passive recipient to an active co-designer in the creation of value. Successful innovators use competence within an extended network which particularly includes the competence of customers (Prahalad and Ramaswamy 2000). In this context, the ability to integrate customers is decisive. Iansiti and Clark understand this to mean the ability to allow information about customers and their needs to flow into the process of innovation on the basis of mutual learning processes (Iansiti and Clark 1994). This ability can be seen as a part of the broader network competence which makes it possible for companies to establish and successfully use relationships with external partners (including customers) within their innovation processes (Ritter and Gemunden 2004).

In this study we explore how large companies use the internet for virtual customer integration. Using the Euro Stoxx 50 companies we analyse where in the innovation process the virtual customer integration is used, if it is used primarily for exploration or exploitation purposes and what the major motivation sources exist for customers to participate in the scheme.
2 Theoretical background

2.1 Cooperation in the innovation process

The so-called MAP-CAP paradigm deals, from a theoretical point of view, with the interaction between manufacturers and customers in the context of innovation processes. Until the end of the 1970s the literature was dominated by the Manufacturer Active Paradigm (MAP) point of view. According to this, it is the manufacturer's task to identify target groups, discover customer needs and, building on this, develop and implement promising, innovative ideas. The customer's role within this paradigm is purely passive, in the sense of "speaking only when spoken to" (Von Hippel 1978a). Von Hippel developed a different view (Von Hippel 1978a; von Hippel 1978b) with the Customer Active Paradigm (CAP). According to this approach, the essential activities at the start of the innovation process are borne by the customers. The customer generates an idea for a new product, formulates a concept and implements the innovative idea as a prototype. The customer then transfers their development and knowledge to a manufacturer, who checks the market potential, develops a marketable innovation, produces and commercializes it.

The cooperative model by Gemünden (Gemuenden 1980) represents another model for interaction in the context of innovation. The core message is that a match should be achieved between the level of requirements aimed for with the solution and the degree of interaction between the manufacturer and customer, whereby for a large innovative step, particularly intensive interaction is to be recommended. While the idea of working separately is postulated in the CAP, Gemünden (Gemuenden 1980) prefers the idea of the manufacturer and the customer working together cooperatively. According to this, a balance between technology and benefits does not come from activities carried out separately, but rather from a learning process on both sides. This learning process is not just possible in the development phase but it is also possible, and makes sense, in the earlier and later phases of the innovation process (Herstatt 1991).

There are conceptual similarities to the "lead user" approach from von Hippel (von Hippel 1986). Lead users are particularly advanced customers who will especially benefit from the solution to a particular customer problem that is relevant for the future. They differ from average customers both in their ability to perceive the needs of the market at an early stage and in their significant interest in a solution to a problem, with the associated high motivation for cooperation (von Hippel 1986; Herstatt, Luthje et al. 2002). The lead-user approach is based on the basic idea of the CAP paradigm, but presumes a cooperative interaction between the manufacturer and selected, particularly innovative customers (Gruner and Homburg 2000). Numerous empirical studies support the CAP paradigm (Lettl, Herstatt et al. 2006), the cooperative model by Gemünden (Shaw 1985) as well as the lead-user approach (Lilien, Morrison et al. 2002). The literature thus speaks of a "paradigm shift in innovation research" in the sense of turning away from an innovation process purely dominated by the manufacturer (Herstatt 1991; Karle-Komes 1997).

2.2 Integrating the customer

The active use of customer competence via the integration of customers is an essential characteristic of customer-oriented innovation processes (Lüthje 2000; Steinhoff 2006; Rohrbeck, Hölzle et al. 2009). Customer orientation is a critical factor both for
the success of the company (Singh and Ranchhod 2004) as well as for the success of
the new product (Kahn 2001). Despite this, a lack of customer orientation continues to
be a frequent phenomenon in the process of innovation (Mason and Harris 2005).

Overcoming the bottleneck factor of customer orientation translates into a
need for information. Both the generation of information by innovation market
research as well as the integration of customers into the process of innovation serve to
reduce uncertainty about the market (McDermott and O’Connor 2002). What,
however, is the difference between these two constructs? In literature, the dominant
understanding is that customer integration "is more" than market research (Jeppesen
2005). For example, Ernst differentiates between aligning the innovation to customer
needs (in the sense of innovation market research) and binding the customer as an
active designer in the process of innovation (Ernst 2002). This means that innovation
market research can be viewed as a type of manufacturer-dominated innovation-
process (Von Hippel 1978a), and customer integration can be interpreted as intensive
interaction between customer and manufacturer in the sense of a cooperative model
(Gemünden 1981) or the lead-user approach (von Hippel 1986; Steinhoff 2006).

In this paper, virtual customer integration is accordingly understood as a type
of intensive interaction between manufacturers and customers, which is more than
market research. In other words, selected customers adopt the role of active co-
designers of the process of innovation (Brockhoff 2003).

2.3 Risks and rewards of customer integration
From a commercial point of view, the question is about the relevance of customer
integration to success. Can success of an innovation be sustainably improved by
integrating the customer into the process of innovation? Research into success factors
looks empirically for factors which make the difference between the success and
failure of innovations (Ernst 2001). In the past, the concept of customer integration
has tended to be neglected in widespread studies in comparison to other factors
(Gemünden, Ritter et al. 1996; Millson and Wilemon 2002). Some synopses indicate
the positive influence of customer integration (Kottkamp 1998) or the carrying out of
test activities such as prototype tests (Lüthje 2000). In the literature there are
relatively frequent references to controversial results on customer integration (Ernst
2002; Van der Panne, van Beers et al. 2003). This is also reflected in the meta-
analysis by Henard/Szymanski, where no significant influence due to customer
integration can be determined (Henard and Szymanski 2001).

A significant reason for this can be suspected in that customer integration, in
the areas of uncertainty, resources and turnover, is not just associated with
objectives/benefits, but in addition with problems/risks (Kirchmann 1996). Relating to
the uncertainty dimension, benefits are listed in the literature such as a better market
understanding, higher product quality and more-innovative products (Campbell and
Cooper 1999; Enkel, Kausch et al. 2005). In contrast, the disadvantages of customer
integration related to uncertainty concern potential problems in identifying suitable
customers, internal barriers to acceptance and conflict during interactions (Athaide
and Stump 1999; Brockhoff 2003; Jeppesen 2005). Aspects concerned with resources
can be advantageous; such as access to missing resources, faster product development
and potential cost reductions (Enkel, Kausch et al. 2005; Bitzer, Schrettl et al. 2007).
At the same time they can also be disadvantageous, such as the high costs of customer
integration, inefficient product development and opportunistic customer behaviour
(Athaide and Stump 1999; Brockhoff 2003; Jeppesen 2005). The literature also
mentions turnover-related aspects of customer integration. This includes advantages
such as a higher product advantage, higher customer loyalty and potential multiplier effects through reference customers (Athaide and Stump 1999) and potential risks of excessive orientation towards a niche and negative image effects (Karle-Komes 1997; Alam 2006).

Customer integration should thus not be assessed as completely positive; it rather requires taking a more considered view (Ernst 2001). Some studies point out, that specific design options of customer integration can affect how successfully the construct can be applied. On the one hand, it is apparent that the affect of customer integration on success depends upon the intensity and the continuity of the customer integration. Successful innovation projects are thus distinguished by customers being intensively included in the very early (idea generation and concept creation) and very late phases (prototype testing and market introduction; Gruner & Homburg, 2000) or the customer integration ranges over the entire process of innovation (Millson and Wilemon 2002). On the other hand, empirical findings indicate that certain characteristics of integrated customers are relevant for success. Apart from lead-user characteristics, the customer being very commercially attractive and the closeness of the commercial relationship prove to be factors for success. To date, no significant influence could be attributed to the characteristic of technical attractiveness (Gruner and Homburg 2000; Lilien, Morrison et al. 2002).

2.4 Innovation process
In the literature there are many models for the process of innovation, which vary in the terminology used by the number of process phases, by the diversity of the structuring and presumptions about activities being sequential or in parallel. Generically and thus largely independently of the sector or situation, one can discriminate between the phases for the generation, selection, execution and commercialisation of ideas (Verworn and Herstatt 2002; Trommsdorff and Steinhoff 2007):

1) The idea generation relates to the search for ideas for innovations as well as any initial pre-selection. For market-pull innovations, demand presents the starting point for innovation, while technology-push innovations are initiated by technical ideas or inventions, which then result in a search for an application (Chidamber and Kon 1994). Creativity is required, which can be supported by creativity techniques, whereby apart from internal sources especially external sources such as customers come into question.

2) In the second phase, selection, the investigation of the feasibility and the return on investment of the innovation in the marketplace take priority. Selection means that ideas for innovations are reduced to those which could potentially be successful. To assess the commercial feasibility, particular care must be taken to see if and when the innovation will be accepted by the target customers (Ram 1989). The investment decision comes at the end of this phase; whether to further pursue the idea or whether to cancel the initiative. This decision is usually based on a business plan or a well-formulated concept.

3) In the execution phase, the emphasis is on development activities, which is generally dominated by the production and test of prototypes (Gruner and Homburg 2000). Iterative and parallel alternative paths are frequently pursued in order to solve a technical problem. The goal is to settle the essential functions of the innovation, the product benefits and the customer segment(s) to aim for. This phase is usually left, when the so-called "design freeze" is
reached, which means that all important product functions and the marketing concept have been decided.

4) The commercialization covers the introduction of the innovation to the market. As a rule, the product has already been successfully tested in pilot installations, so that in this phase the emphasis is on addressing the wider market. In the interests of designing the operational processes as efficiently as possible, product changes are now only marginal in nature. During the introduction, the marketing mix must be implemented referring to the strategy followed with the innovation. Communication takes a particularly prominent role here. Only when the product advantages are perceived by the target customers and are understood as beneficial, can the innovation succeed in the market (Rogers 2003).

2.5 Customer integration into the innovation process
During the various phases of the innovation, customers can take on differing roles and functions (Herstatt 1991; Alam 2006). Customers who initiate an innovation project, so-called initiators, provide active input to an innovation project in that they formulate concrete needs or problems during the phase of ideas generation, or are actively inventive. In the selection phase customers might take the role of advisor, formulate concrete requirements on the design of the innovation, or act as assessors of innovation concepts. The most intensive form of interaction consists in the function of the customer as a partner. Here, customers actively help to shape the process of innovation in that they participate during the execution phase in the design and development or act as a prototype tester (Herstatt 1991). For example, user toolkits for innovation (von Hippel 2001; Thomke and von Hippel 2002) enable customers to develop and test tailor-made products themselves. After all, during the commercialization, so-called marketers promote the acceptance of the innovation in the market through their function as pilot and/or reference customers (Herstatt 1991). Especially in the context of innovation with a high degree of innovation, it is necessary to reduce the resistance to innovation in the market (Ram 1989; Sandberg and Hansén 2004).

2.6 Virtual customer integration
In virtual customer integration (VCI) approaches the internet is used as the prime communication channel. Such communication can be unidirectional, e.g. the customer can post ideas for new products, or bidirectional, allowing for discussions between the customer and a development engineer. Also the level of richness can vary from simple text communication to multi-modal interfaces or user-innovation toolkits, where the customer can manipulate the final product. The internet supports peer-to-peer communication which makes company-to-customer communication as well as customer-to-customer communication easier. VCI tools can address customers individually or via online communities (Füller 2007). Such communities allow companies to learn about the wants and needs of specific customer segments (Dahan and Hauser 2002).

VCI platforms are expected to yield multiple benefits for companies. Using the internet companies can interact in a less costly manner with their customers and bypass intermediaries such as market-research firms (Ernst 2004); they can in-source creativity by enabling users to create and evaluate products (Füller, Bartl et al. 2006; Füller 2007); and through a VCI platform theoretically an unlimited number of customers can be integrated, resulting in a broader decision base for product
development (Füller and Matzler 2007). Integrating real customers into the product development has also been argued to be preferable to using mere representative customer segments, enhancing the richness of feedback (Pruitt and Adlin 2006).

2.7 Motivation sources of participating customers

From open-source software development projects, we have learned that the prime reasons for participation are non-monetary. These motivation sources can be differentiated into social and hedonistic on the one hand and target-oriented, like reputation and learning, on the other (Shah 2006; Wu, Gerlach et al. 2007). Füller showed that virtual participants in innovation processes are driven by similar drivers, and identified 10 different motivation sources (Füller 2007). For this study we integrated Füller’s sources into four clusters:

- **Entertainment and curiosity** is the motivation source that builds on pure enjoyment of the interaction itself. VCI tools might allow customers to interact with a wide spectrum of multimedia impressions, offering detailed information about a new or potential product. The tool itself might thereby satisfy the customer’s need for entertainment and curiosity. Users perceive participation in such VCI activities as an enjoyable activity which is seen as intrinsically rewarding (Füller 2007).

- **Social recognition** has proven to be the prime driver of participation especially in the field of open-source software development (Bitzer, Schrettl et al. 2007). People identify themselves with a social network in which they act altruistically and follow the rules of the community for the sake of being part of the group and being recognized by their peers (Piller 2003; Wu, Gerlach et al. 2007).

- **Personal need and product usage** are motivation sources identified by von Hippel in lead users (von Hippel 1986). Such users participate in order to solve a specific problem or meet a specific need (Füller 2007) and they benefit directly from the output (e.g. software) by being able to use the new or enhanced product.

- **Monetary incentives** can be immediate as well as delayed payoffs, for example when a product enhancement has proven meaningful for other users or a product idea has been taken up by product development (Füller 2007).

Another potential motivation source identified in open-source software development is the development of professional skills and the signalling of personal competencies to potential employers (Bitzer, Schrettl et al. 2007; Wu, Gerlach et al. 2007). For our study these motivation sources were excluded because none of the VCI tools could be associated with this aim.

3 Research approach

3.1 Research strategy

Past research has identified different kinds of VCI platforms, their value contribution along the innovation process (Ernst 2004) and different motivation sources for participation (Füller 2007). With our study we want to extend this knowledge by creating a typology of VCI platforms and pave the way for quantitative research. To allow a cross-industry comparison and ensure consistency we used the Euro Stoxx 50 companies as our sample. We address three major research questions:

1) To what extent do the Euro Stoxx 50 companies use VCI (within the innovation-process phases and with what intensity)?
2) What are the means by which customers are motivated to participate?
3) What possible extensions and enhancements of VCI practices exist (building on the best-practice cases)?

3.2 Data collection
Different search strategies were utilized in order to find VCI tools within the Euro Stoxx 50 sample. Firstly, the company’s website was searched for any elements that offered users’ interaction with the company. Secondly, the company’s website as well as the annual report was scanned for innovation activities, awards or customer integration programs. Thirdly, the corporate website was searched for the keyword ‘feedback’. Fourthly, a query in an internet search engine was executed which contained company and brand name and the keywords ‘customer integration’, ‘crowdsourcing’, ‘open innovation’ and ‘feedback’. In addition to the Euro Stoxx 50 companies we identified and assessed 15 best practice cases to define the set of criteria for assessment of the level of proficiency of Euro Stoxx 50 companies. The best practice cases were also used for a cluster analysis to identify generic typologies of VCI platforms.

3.3 Data filtering
In order to qualify a customer integration initiative to be a VCI platform three criteria had to apply:
1) The tool had to address customers from outside the company. Excluding initiatives that refer exclusively to the company’s own employees (e.g. the “ideas to success” project by Allianz) were out of scope, as they do not aim at integrating customers.
2) The tool had to enable systematic collection, evaluation and channelling customer input into the innovation process. For example pure product-configuration platforms—such as offered by car manufactures—which allow customers to customize their product (von Hippel and Katz 2002), have been excluded, because they lack the objective to use the information in the innovation process.
3) The tool had to permit a rich virtual interaction. The provision of an e-mail-address or feedback forms, were considered as substitutes for paper-based communication and excluded.

3.4 Data interpretation
In order to analyze differences in the virtual integration platforms, we differentiated the identified platforms concerning the relevant phase of the innovation process and applied motivation sources.

3.4.1 Innovation-process phases
As described in detail in the chapter ‘innovation process’, we used a four-phase-model to systemize the innovation process: idea generation, selection, execution and commercialization.

In each phase, we specified constitutive items (i.e. functions) that had to be present in order to classify the cases into the different phases. For the first phase the items include e.g. the possibility to post and read ideas posted by other customers. For the second phase functions such as the possibility to comment on ideas of others (e.g. in blogs or forums) and the request to select or rate given ideas were searched. For the execution phase a tool had to allow users to actively contribute their own solution or
even fabricate prototypes by themselves. For the commercialization phase we looked for functions that request opinions on existing or upcoming prototypes, allow the user to commercialize their own prototypes or engage the user in marketing or distribution activities.

3.4.2 Motivation sources for participation

In our study, four categories of motivation sources were differentiated, as described in the chapter ‘motivation sources of participating customers’: Entertainment and curiosity, social recognition, personal needs and product usage and monetary incentives.

In order to identify the motivation source category that was used primarily in the VCI tools we searched for predefined characteristics. For entertainment and curiosity we searched for multimedia elements and the easiness of access. A tool was judged as entertaining when it had a playful task or a trial-and-error functionality. It was scored as sparking curiosity when it was related either to customers’ potential free-time activities or to their private everyday life. The characteristics for social recognition were awards, support of communication and interaction among users, any kind of rankings (e.g. based on page hits, number of contributions, ratings, etc.) as well as platforms that create a feeling of belonging. The motivation source personal needs and product usage was perceived to be relevant when customers can use the product or service they helped to develop. A monetary driver can be the payment either in real money, in virtual money, by a voucher or by the offering of free goods, such as free software for a developer community.

3.4.3 Intensity of interaction

In addition to assess the VCI platforms concerning step in the innovation process and source of motivation, we aimed at establishing an understanding about the intensity of interaction. To do so the best-practices were analysed and a set of three to five criteria was defined for each dimensions of analysis (i.e. the innovation-process phases and the motivation sources for participation). For scoring three-point scale (0=no interaction to 3=maximum interaction) was used. This allowed measuring the intensity in a transparent and objective way.

3.4.4 Cluster analysis

To enhance the understanding of goals and impact of the different platforms a cluster analysis was used to identify generic types of platforms. A cluster analysis is ideally suited for defining groups of objects with maximal homogeneity within the groups, while also having maximum heterogeneity between the groups. In consequence the cluster analysis determines the most similar groups that are also most different from each other. As input data for the cluster analysis we used the innovation process phase and the motivation sources including their intensity. For the choice of algorithm we have chosen a hierarchical clustering methods following Bühl’s argumentation that hierarchical methods are best suited for small sample sizes (Bühl 2006).

3.5 Data validation

For both, tool classification and intensity rating, we used two iterations by two researchers: In the first iteration the classification and rating were carried out, and in the second iteration a different researcher validated the first classification and ratings. Differences in rating were discussed and a joint rating was made. This approach was used to enhance the objectivity and ensure consistency of scoring.
4 Research findings

Within the sample of Euro Stoxx 50 companies, 13 had introduced a VCI platform. Of these four companies had even deployed multiple VCI platforms for specific purposes. All of these platforms have been analyzed by scoring the intensity concerning the innovation phase/-s and the motivations sources.

4.1 Usage of VCI tools within the Euro Stoxx 50

4.1.1 Focus on idea generation

From previous studies it was expected that the usage of VCI tools along the innovation process would vary (Reichwald and Piller 2005) and that the focus would be on the idea-generation phase (Ernst 2004). Dahan and Hauser noted: “While virtual customer methods may be used at every stage of product development, not every method will be used at every stage” (Dahan and Hauser 2002).

![Figure 1: Usage of VCI tools along the innovation process](image)

This hypothesis was sustained by our study which shows a significantly higher number of VCI platforms that are active in the idea generation phase than in the others (see Fig. 1). In all VCI platforms the sourcing of ideas is intended, although the functionalities have a varying degree of intensity. In the selection phase, 7 out of 13 VCI platforms showed significant functionalities. Tools that support the execution phase allow the customers to contribute or comment regarding the development of the product. 4 out of 13 companies run platforms that support such functions. The integration of customers in the commercialization phase can be used for comments on the products and/or collaborative product marketing. 5 out of 13 cases proved to offer functions in this respect.

4.1.2 Non-monetary motivation sources make it work

From empirical evidence from the open-source software development and previous research on VCI it was expected that little emphasis will be on monetary incentives (Füller 2007; Wu, Gerlach et al. 2007). Concerning the non-monetary motivation sources, little knowledge existed on what source might be dominant.
In consensus with previous findings, platforms in our sample used little monetary incentives to motivate the participation of customers (see Figure 2). Only two out of 13 companies used monetary incentives to motivate customers to participate. In both of these cases the monetary incentives were accompanied by non-monetary ones. In the group of the non-monetary incentives, entertainment & curiosity is the strongest with ten companies out of 13 scoring high or medium on the intensity scale. Social recognition which is the strongest in open-source software development (Wu, Gerlach et al. 2007) has also been used by nine out of the 13 companies. Product usage & personal need is the key driver in two companies and an additional six companies use it to a medium and low degree.

4.2 Platform Typology

In order to better understand the commonalities and differences in the identified VCI platforms a cluster analysis was used to develop a typology of VCI platforms. The resulting four clusters are described in Table 1.

<table>
<thead>
<tr>
<th>Type</th>
<th>Innovation-process phases</th>
<th>Motivation sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Innovator</td>
<td>All phases High intensity</td>
<td>Non-monetary (emphasis on curiosity and product usage)</td>
</tr>
<tr>
<td>Outsourcer</td>
<td>Idea generation and execution phase Medium to high intensity</td>
<td>Monetary (and in some cases also product usage)</td>
</tr>
<tr>
<td>Idea Seeker</td>
<td>Idea generation and selection High intensity</td>
<td>Non-monetary (emphasis on entertainment, curiosity and product usage)</td>
</tr>
<tr>
<td>Experimenter</td>
<td>Various phases Low intensity.</td>
<td>Non-monetary (emphasis on product usage and entertainment)</td>
</tr>
</tbody>
</table>
4.2.1 Open Innovator

Open Innovators are platforms that support all phases of the innovation process with an overall high intensity. For example, Vodafone’s ‘βvine’ portal consists of the three sections: ‘Play’, ‘Develop’ and ‘Interact’. The section ‘Interact’ contains forums where consumers can post ideas for future applications. In the ‘Develop’ section, a variety of resources is offered to professional and non-professional application developers. In the ‘Play’ area, these applications can be installed, tested and further developed by other users. Therefore, ‘βvine’ is a platform that supports idea generation, by allowing users to post ideas; selection, by using explicit customer feedback and download numbers of the new application; execution, by providing a developer toolkit where new applications can be developed; and to a certain extent also commercialization, by allowing users to purchase the new applications and services from Vodafone.

Open Innovator platforms use primarily non-monetary motivation sources. Entertainment, curiosity and product usage are the dominant ones. Testing software offered on ‘βvine’ is expected to have a strong entertainment aspect, while for example the ‘BrowserVodafone’ for mobile phones has a high product-usage value.

4.2.2 Outsourcer

Platforms that are categorized as outsourcers integrate their users into the idea-generation phase as well as the execution phase, while excluding them from the selection phase.

On ‘Forum Nokia’, software developers can find resources and technical services required for programming software that is compatible to Nokia devices. In addition, developers can share their ideas and post their questions in multiple online communities such as discussion boards, wikis and blogs. In contrast to Vodafone’s ‘βvine’, ‘Forum Nokia’ does not allow users to rate or comment on applications and thus is not supporting the selection phase, but the support for the commercialization phase is much more pronounced by the ‘Go To Market’ section of the portal, where developers can find information and advice about bringing their applications to the market.

Participants of outsourcers obtain their motivation from more tangible sources such as monetary-participation schemes. To a smaller extent, improving a product according to customers’ individual requirements can be judged as motivating in the sense of our product-usage-motivation source.

4.2.3 Idea Seeker

Idea-seeker platforms involve customers intensively in the idea generation and the selection phase of the innovation process. The applicability of users’ input can vary from platforms in which the customer offers a concrete product idea (e.g. submission of t-shirt layouts in Threadless) to platforms which generate very broad ideas (e.g. Philips Electronics’ discussion platform ‘Live Simplicity’). The motivation sources are a combination of the customers’ wish for a new or a better product and the overall interest of the product and its environment.

A good example for the efficient combination of the generation and selection of ideas is Dell’s ‘IdeaStorm’. Customers are invited to post and discuss ideas for new Dell products or services. An easy-to-use ranking system allows users to rank these ideas as positive or negative. In this way, Dell not only obtains customer ideas for new products or product improvements, but they get valuable support for selecting the most promising ideas. Users do not receive any monetary reward for registration and
sharing their ideas, therefore product usage is expected to be the prime motivation source for participating. In addition, rating ideas is expected to motivate to a certain extent in terms of curiosity.

4.2.4 Experimenter

Experimenters are VCI platforms that support various phases of the innovation process with only a low intensity. These platforms are generally motivated by non-monetary sources, such as entertainment or product usage.

Within the group of experimenters no clear pattern to explain the low intensity of activities has emerged, hence the name, referencing to the perception that the VCI activities have experimental character and are merely the first step for the establishment of a VCI platform. One example is Deutsche Börse’s (German Stock exchange) ‘Börse Frankfurt-Weblog’. Within this Webpage customers can post thoughts and ideas which can be commented by anyone. The blog does not contain any multimedia elements and the only form of interaction with the customer is his or her textual comment. Implementing a blog can be done without much effort and can therefore be an appropriate starting point for VCI activities. The company gains experience about the quantity and quality of customers’ interaction and their interest and needs for interaction. Simultaneously, the customers get accustomed to being involved with the company and experiment with the influence which they can have on the company’s process innovations.

5 Discussion and conclusion

5.1 Limitations and Future Research

When interpreting the results of this study, some limitations should be considered. Although the sample of Euro Stoxx 50 companies has its strength in its transparency, it also has a weakness in terms of consistency over time, as the Euro Stoxx 50 is subject to change, and in consequence the reliability of the findings is subject to a certain limitation.

Furthermore, the process of finding VCI platforms has a limited reliability as some companies run their platforms under a different name or brand, resulting in them not being identified by our study. This limitation could be reduced by establishing direct contact with the companies or sending out questionnaires.

An interesting extension for further research would be to differentiate the degree of innovation, which results from virtual customer integration. Platforms such as ‘IdeaStorm’ by Dell might suggest that incremental innovation is the mayor target, while Philips Electronics’ platform ‘Live Simplicity’ targets more-radical innovations by engaging the customer into discussion on long-term, social-economic developments.

5.2 Implications

There are several managerial implications which can be derived from our results:

- **Further development potential for VCI tools.** Our study showed that currently only 26% of the Euro Stoxx 50 companies use VCI platforms. Therefore, there is still a potential for 74% to use VCI platforms for improving the innovation process. Our study also suggests that there is not a limitation to certain industries, as even companies from industrial areas such as the financial sector have successfully introduced some VCI functions.
• **Understanding the motivation sources of the users is key.** Beyond the Euro Stoxx 50 sample, best-practice cases exist that created highly frequented VCI platforms. For instance “BBC Have Your Say” or the InnoCentive Inc., have more than 135,000 registered participants. In comparison, most platforms from the Euro Stoxx 50 sample have not mastered the creation of a functioning, i.e. highly frequented, platform with active users. It is expected that it takes multiple iterations and platform improvements in order to understand the needs of users as well as their preferences in terms of interaction functions and content of the VCI platform.

• **Valuable contribution to the innovation process for low costs.** Particularly the best-practice cases show that there is value to be extracted from VCI activities. Dells ‘IdeaStorm’ has a pool of almost 9,000 user-generated ideas with around 67,000 comments. Popular ideas are rated up to 18,000 times. In consequence Dell gains a very clear picture of customers’ needs at a much lower cost than through traditional market research or even employing R&D staff to generate, formulate and rate the ideas themselves.

6 References


## Appendix A: Referenced VCI Tools

Full list of identified VCI tools in alphabetical order.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Tool Name</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcatel S.A.</td>
<td>Xtreme Innovation Contest</td>
<td>see <a href="http://www.sys-con.com/read/448446.htm">http://www.sys-con.com/read/448446.htm</a></td>
</tr>
<tr>
<td>Allianz SE</td>
<td>Dialogcenter</td>
<td><a href="https://fachmann.allianz.de/dialog_app/intranet/dialog/start.html">https://fachmann.allianz.de/dialog_app/intranet/dialog/start.html</a></td>
</tr>
<tr>
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