Customers as part of value webs: Towards a framework for webbed customer innovation tools

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Abstract

As the classical corporate boundaries are beginning to blur internally as well as externally and, in some cases, even dissolve, a new model is emerging: electronic networks and markets allow the break-up of what previously thought to be firmly controlled value chains or systems. The value chain looses its chain attributes, and is replaced by a web of fluid and flexible relations - the value web. This paper will extend the common view of value webs by defining customers as an important part of value creation. The close integration of customers’ capabilities and resources into a firm’s value creating system offers new possibilities to both increase operational efficiency as well as to define strategic uniqueness.

Within customer integration, an area offering large opportunities is innovation management. Often, innovations cause enormous investments, hence a failure in terms of accumulated flops could easily jeopardize the continuity of the whole company. Before this background, customer integration into innovation processes taking place within a value web (a process that will be coined “webbed customer innovation” in this paper) is discussed as a beneficial method to overcome some of the flaws and challenges of new product and technology development. The role of the customer is changing from a pure consumer of products or services to a coequal partner in a process of adding value - consumers are becoming co-producers and co-designers.

While this new role of consumers is already discussed in the literature to some extent, not only the practical application of webbed customer innovation lacks of systematisation, but also many research papers are characterized by mere descriptions and enumerations of different kinds of webbed customer innovation tools and methods without a consistent framework. Thus, we offer in this paper a framework for webbed customer innovation tools by introducing the concept of the customer-integration-cube (CIC). The CIC renders a systematisation of webbed customer innovation tools on the basis of specific dimensions, which were identified as most important, and serves as an originator to reveal possible lacks of webbed customer innovation attempts. In consequence, the potential of the CIC will be explored by applying its concept to a large sporting goods manufacturer.
1. Webbed customer innovation

“The classical corporate boundaries are beginning to blur, to change internally as well as externally, and in some cases, even dissolve” (Picot, Reichwald, Wigand 1997). This statement directly addresses the great shifts in today’s economy, such as the changes in the competitive situation of firms, the transition from vendor to buyer markets and the arising of innovative Information and Communication Technologies (ICT) accompanied by significantly lower procurement, processing, and information costs. Radical changes are spurred in the way companies operate internally as well as externally and cause the de-integration of industrial market structures. The results are smaller firms, virtual organizations and complex inter-organizational structures. A new business model is emerging: electronic networks and markets allow the break-up of what previously thought to be firmly controlled value chains or systems. The value chain looses its chain attributes, and is replaced by a web of fluid and flexible relations - the value web (Selz 1999).

Another important shift of focus is the rediscovery of innovation (Gruner, Homburg 1999). This paper focuses on product innovations in B2C industries, in terms of a “new product, which was not yet enclosed in the company’s current program” (Kieser 1984). This definition embraces radical innovations (Christensen 1996) as well as modifications with only a marginal degree of innovation (Herstatt 1992). Additionally, products are defined as bundles of properties, which support the corporate objective to satisfy the expected customer’s needs (Kotler 1989). Although innovations are considered as key factors for corporate wealth since the beginning of business research (Schumpeter 1934), a change in the strategic orientation of companies can be observed: Most often innovations cause enormous investments, hence a failure in terms of accumulated flops could easily jeopardize the continuity of the whole company (Christensen 2000). “Today no one needs to be convinced that innovation is important – intense competition, along with fast changing markets and technologies, has made sure of that. How to innovate is the key question” (Drucker 1998). Taking the rapid and progressive development of value webs and the increasing importance of innovations into account, customer integration into innovation processes is presented very often as the only loophole (Kleinaltenkamp et al. 1996; Urban / von Hippel 1998; von Hippel 1985; von Hippel 2001).

Within customer integration, “consumers take part in activities and processes, which used to be seen as the domain of the companies” (Wikström 1996, p. 360). Customer integration (especially in B2C markets) is considered as a continuous development of the framework of value webs, which is reported in most of the literature as integrated value systems consisting of cooperating companies.
serving either other companies or private consumers. However, private consumers are generally not mentioned as part of a value web. Atkins et al. (2002) discuss the change of firms from a mode of „pre-partnership“ to a mode coined “customer performance partnership”. While in the first mode process improvement, root-cause problem solution, stakeholder orientation and cross-functional, customer oriented teams are important abilities, competencies of the latter mode are process integration, stakeholder involvement, and customer-supplier team-based activities. By moving from mode 1 to mode 2, firms are becoming more customer integrated.

While customers can perform activities at all levels of a value web, participation and integration in the innovation process is seen of predominant importance. We will coin the process of integrating customers (and users) into a value web within the innovation function as **webbed customer innovation** in the following. Webbed customer innovation refers to the systematical collection and preparation of information from customers and users to generate innovations, modifications or service specifications within a value web, which totally meet the customer’s requirements. With the help of modern ICT, customers are interacting with the suppliers within a value web by expressing, specifying and configuring their requirements for innovations. The role of the customer is changing from a pure consumer of products or services to a coequal partner in a process of adding value - consumers become pro-sumers and co-designers (Hippel 2001; Reichwald et al. 2003). Nevertheless not only the practical application of webbed customer innovation seems to show a great lack of systematisation, but also theoretical research, where often mere descriptions and enumerations of different kinds of webbed customer innovation tools and methods can be found (Cooper, Kleinschmidt 1995). Thus, the **objective of this paper** is to develop a framework for webbed customer innovation tools, the customer innovation cube (CIC). This framework shall serve as point of origin to reveal possible lacks of webbed customer innovation attempts. We will apply the concept in a case study with a large international sports good manufacturer (referred as “SpoCo” in the following, due to reasons of disclosure).
2. Research approach

This paper presents and discusses learnings from an ongoing explorative research project on B2C-webbed customer innovations. While our objective is to discuss approaches for bridging the boundaries between suppliers and their customers in order to build up individual and profitable relationships, the project itself bridges between management research and management practice in many respects. It builds on a long-term cooperation with SpoCo, a leading international sports enterprise, which represents the stable backbone of our research project giving access to current management problems and strategies at the webbed customer innovation interface. The trigger for the current research project was clearly rooted in the joint interest of SpoCo and our research team to learn more about the business challenges and potentials of webbed customer innovations. Started in 2000, this research cooperation gave us the chance to co-create a joint perspective and understanding of webbed customer innovation challenges and to stepwise develop and refine solutions to those challenges.

Our research methodology evolved as follows (see also Figure 1): Based on a conceptual pre-understanding of webbed customer innovations in the early beginning, we focused in the first step on intensive desk research in terms of studying in depth the available literature about webbed customer innovations (see Part 3 of this paper). Additionally, we explored the practical potential of webbed customer innovations by analysing successful practical applications in business to consumer industries (Part 4). Building on this early theoretical and practical in-depth studies, our research team was able to develop a framework for a systematisation of webbed customer innovation tools. The concept of the customer-integration-cube (CIC) will be introduced (Part 5). It renders a systematisation of instruments on the basis of specific dimensions, which were identified as most important for webbed customer innovation and serves as an originator to reveal possible lacks of webbed customer innovation attempts.

In a second step the concept of the CIC was applied to SpoCo (Part 6). Based on the results from this exploration, we are currently in the process of developing and implementing a webbed customer innovation tool, which will be piloted at the company in Quarter 3 and 4, 2003 (Part 7). Early results from this piloting phase are expected be delivered in early 2004.
In doing so, our research follows the *Munich School of Exploratory Research* aiming at the co-creation of knowledge in close collaboration between management research and practice (e.g., Reichwald 1984; Picot 1985; Koller 2000). The approach is rooted in the fundamental work of Eberhard Witte, a German management scholar, who established his school of empirical management research in the German business administration community in the late 1960s and early 1970s (Witte 1977; Hauschildt/Grün 1993). Witte's work emphasised the creation of knowledge in exploratory research settings. The exploratory management research presented in this paper follows this research strategy. It looks at management research as a "design science" that does not stop with normative design suggestions, but aims to pilot and evaluate design suggestions in field experiments in order to generate real world experience as a basis for theory development (see similarly Witte 1997; Gummesson 2000; van Aken 2001; Tranfield 2002).
3. Literature Review

Many authors demonstrate theoretically and empirically that webbed customer innovation can be a promising factor for successful innovations. Research on webbed customer innovation derives in varying research directions and understandings. Figure 2 presents an overview of different lines of research, of which we will review some explanatory works in the following.

<table>
<thead>
<tr>
<th>Author</th>
<th>Study</th>
<th>Year</th>
<th>Field</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franke, Nikolaus</td>
<td>Satisfying Heterogeneous User Needs via Innovation Toolkits:</td>
<td>2002</td>
<td>Apache (Open Source Software)</td>
<td>Instrument (Toolkit)</td>
</tr>
<tr>
<td>von Hippel, Eric</td>
<td>The Case of Apache Security Software, Research Policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management Science, Vol. 32</td>
<td></td>
<td></td>
<td>(lead user)</td>
</tr>
<tr>
<td>Herstatt, Cornelius</td>
<td>Anwender als Quelle für die Produktion, ADAG</td>
<td>1991</td>
<td>Anchorage system at Hilti</td>
<td>Phases of innovation, Instrument</td>
</tr>
<tr>
<td></td>
<td>Administration &amp; Druck, Zürich</td>
<td></td>
<td>(machinery company)</td>
<td></td>
</tr>
<tr>
<td>Brockhoff, Klaus</td>
<td>Der Kunde im Innovationsprozeß, Joachim Jungius Gesellschaft der</td>
<td>1998</td>
<td>Different examples from B2B</td>
<td>Phases of innovation, Customer characteristics</td>
</tr>
<tr>
<td></td>
<td>Wissenschaften, Hamburg</td>
<td></td>
<td>(e.g. Airlines, Automotive,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administration &amp; Druck, Zürich</td>
<td></td>
<td>EDV, Machinery)</td>
<td></td>
</tr>
<tr>
<td>Gruner, Kjell</td>
<td>Customer Interaction as a key to New Product Success, Wissenschaftliche</td>
<td>1998</td>
<td>German machinery industry</td>
<td>Phases of innovation, Contribution of customer, Customer characteristics</td>
</tr>
<tr>
<td>Homburg, Christian</td>
<td>Arbeitspapiere, Nr. W16, Institut für Marktorientierte</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unternehmensführung, Mannheim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engelhardt, Carsten</td>
<td>Dienstleistungs-Innovation durch Kundenintegration, FGM-Verlag,</td>
<td>1999</td>
<td>Service Marketing</td>
<td>Contribution of customer</td>
</tr>
<tr>
<td></td>
<td>LMU-München</td>
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</tbody>
</table>

Figure 2: Selected research directions of webbed customer innovation

Franke and von Hippel (2002) put a strong focus on the instrumental aspect of webbed customer innovation. In their study about Apache, an open source server software, they examined the question, if “toolkits for user innovation” benefit users. Toolkits as instruments for webbed customer innovation facilitate new product development by allowing producers to outsource certain design tasks to customers. They are able to attenuate classic innovation conflicts between time-to-market, product quality, and development costs to increase the likelihood of innovation success. A supplier provides customers with a toolkit so that they can design and develop application-specific parts of a product on their own by creating a preliminary design, simulate and prototype it, evaluate its function, and then iteratively improve it until they are satisfied (Thomke, von Hippel 2002). In this way, products are expected to be developed more quickly and at lower costs. Customers, in turn, most likely get exactly what they want – a custom product that suits their individual needs precisely (Franke, Schreier 2002). Von Hippel and Franke conducted a survey with 138 participants and evaluated it using a cluster
analysis. As a result they found that users, who created their own product were significantly more satisfied than users who only bought the standard products. In addition to toolkit-explorations Eric von Hippel is well established in lead user research focussing on the characteristics of customers. In the 80’s Hippel hypothesized, that lead user can contribute not only personal data but also ready-made product-concepts and designs (von Hippel 1982). This is because of two characteristics:

1. “Lead users face needs that will be general in marketplace - but face them months or years before the bulk of that marketplace encounters them, and

2. Lead users are positioned to benefit significantly by obtaining a solution to those needs.”

The first characteristic shows that lead users hold the necessary “real world experience” for future needs. Moreover von Hippel states, that those users “… who have experience with a need are more able to give accurate information regarding it than those without such experience” (Urban, von Hippel, 1988). The second characteristic aims at the fact, that lead users benefit the most from the new product and – what is more - are able to build prototypes on their own.

Herstatt (1992) focuses on the usability of the lead user concept at the different phases of an innovation. With the help of qualitative research methods, such as action research, case study and expert interviews he analyses the webbed customer innovation into the development of new anchorage system at Hilti, a machinery company based in Liechtenstein. Herstatt finds that the lead user concept could not be applied in all phases, moreover the idealized “von Hippel-concept” has to be adapted in every phase. Additionally he mentions that there are several circumstances in new product development, where the lead user approach fails completely, e.g. complex products in the chemical industry.

The study of Gruner and Homburg (1999) analyses the critical success factors of new product development. Thus, two aspects are focussed:

- the degree of consumer interaction in different phases of new product development
- the characteristics of the involved customers

The results of a survey among 310 managers of the German machinery industry were analysed with the help of confirmatory factor analysis (for measure validation) as well as cluster and discriminant analysis. It was found that the degree of customer interaction in early and late stages of a new product development process (not in the middle stages) increases success.
Similarly Brockhoff (1998) focuses on the characteristics of customers and on the phases of innovation. He introduces 5 different types of customers:

1. Customer as source for demand
2. Customer being actively involved in the development process
3. Customers as innovators (similar to lead user concept)
4. Customer as source for application knowledge
5. Customers helping to overcome intra-organisational resistances

Brockoff states that a strong integration of pilot-customers correspond to a “demand-pull-development”, which holds the risk of missing radical innovations. Moreover he finds that different types of customers become relevant in different phases of the innovation process. For example lead user are considered to be integrated best into the concept phase. Finally, Brockhoff concludes that not every customer is equally suited for integration, in addition the contributions given by different customers differ enormously.

Likewise, the character of the customer’s contribution in the innovation process is focused by Engelhardt (1999). Based on the statement that “…successful new services rarely emerge by mere happenstance” (Scheuing, Johnson 1989) research is done in the field of service engineering. Engelhardt states that webbed customer innovation into the development of new services help specifying the requirements initiate and determine the innovation process, and support decisions and evaluations during the design phase. Thus, the contribution of the customer can be:

- providing information
- making decisions and evaluations

In summary we found that literature on webbed customer innovation tools is often unsystematically in terms of containing either mere descriptions and enumerations of webbed customer innovation tools or highlighting one specific success factor of webbed customer innovation (e.g. the contribution of the customer) without any assignment to other variables, which have been identified as critical success factors for webbed customer innovation.
4. Case study research on webbed customer innovation

In order to obtain exploratory insights into applications of webbed customer innovation and to explore its potential we conducted a large-scale analysis of practical examples in business-to-consumer industries. In such an environment, in-depth case studies are seen sufficient to provide exploratory insight into business mechanisms, value drivers, and success factors (Bettis 1991, Kotha 1995). Starting point of our research is a database of roughly 220 qualitative case studies in the field of customer integration, (mass) customization and relationship marketing. The cases were collected and documented by our research institute since 1995. Data was gathered by secondary sources such as reports, databases as well as internet publications and - when secondary data was not sufficient - by primary sources such as semi structured interviews with managers, academics and consultants (see Piller 2003 for a more detailed documentation of this database). From this database, we selected companies for the research presented here according to the following structure: First, we selected companies, which integrate customers explicitly into their innovation processes. Secondly, we reduced this field to companies operating in business-to-consumer markets and, thus, integrating private end-consumers. Thirdly, we tried to identify firms reported to exhibit promising practice within their industry or companies, which are often quoted as a leading example in the literature. This selection step is rather subjective. In order to increase reliability, this evaluation was based on a process of group discussions within the research team (c.f. Gummesson 2000). As a result, we could identify roughly fifteen firms meeting our requirements. Figure 3 gives an overview of five exemplary cases using different tools and methods for webbed customer innovation quoted often in the literature (Piller 2003; Reichwald et.al 2003; Thomke/von Hippel 2002; von Hippel 2001; von Hippel/Thomke/Somnak 1999).
<table>
<thead>
<tr>
<th>Company</th>
<th>Examined Product</th>
<th>Tool / Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 M (<a href="http://www.3m.com">www.3m.com</a>)</td>
<td>Surgical Hygiene Products</td>
<td>Lead User</td>
<td>New product development with the help of the lead-user (LU) method was conducted in 4 phases: (1) Definition of the research objective, (2) Expert interviews, (3) Identification of LU, (4) Workshops with LU and development of concepts. As a result not only new products but new product-lines were developed in 7 departments of the company.</td>
</tr>
<tr>
<td>Federal Ministry of Health and Social Security, Germany (<a href="http://www.bmgs.de">www.bmgs.de</a>)</td>
<td>Anti-Aids Campaign</td>
<td>Idea Competition</td>
<td>To support the German &quot;no chance for aids&quot;-movement the Federal Ministry of Health and Social Security has created an idea competition for advertising a &quot;pro-condom&quot; campaign in the time June to September 1999. Target group was the whole population of Germany. For that reason free postcards were offered at public places, which ought to be designed. Condom-shaped stickers on the back, could be glued on the front and added with individual drawings and slogans. The participation was immense, a jury judged the best idea, which was enlarged to large-area billboards in whole Germany. Empirical research has shown that the perception of the campaign increased significantly after the idea competition.</td>
</tr>
<tr>
<td>Epic Game, Infogrames, Digital-Extremes (<a href="http://www.unrealtournament2003.com">www.unrealtournament2003.com</a>)</td>
<td>&quot;Unreal Tournament (UT)“, Computer Game</td>
<td>Community</td>
<td>A virtual community was found for the development of UT 2003 (&quot;Unreal developer network&quot;). The online platform offers several functions, such as forums, chats, documentation, source-code access and training-sites. With the appropriate hardware every user is able to run his own game server. A special 3D-modelling tool enables the user to create own scenarios. A few weeks after the release more than 700 sites existed, although only 42 were developed by the company. Stock market awarded this promising development.</td>
</tr>
<tr>
<td>Swarovski (<a href="http://www.swarovski.com">www.swarovski.com</a>)</td>
<td>&quot;Chrystal Tatoo&quot;, Costume jewelry</td>
<td>Tool kit, Idea competition</td>
<td>A idea competition for new &quot;crystal tattoo&quot; (=pearl configurations, that can be glued on the skin) designs was conducted in 2002. With the help of a web-based toolkit customers were able to design their own arrangements of pearls. After 3 weeks the website was closed, the received designs were assessed by a professional jury and the winners were awarded. As as a result the winning design was mass produced.</td>
</tr>
<tr>
<td>Freitag (<a href="http://www.freitag.ch">www.freitag.ch</a>)</td>
<td>Customized bags</td>
<td>Configurator</td>
<td>The Swiss company Freitag sells fashionable shoulder bags made of used truck tarps and safety-belts. The bag consists of 4 main-parts. With the help of an online configurator sewing patterns of these parts can be placed and moved on photos of the tarps. Simultaneously the selected part of the tarp appears on a outlined drawing of the bag. Every movement of the pattern is shown in real-time on the bag. If the customer has designed the bag completely, it can be ordered online.</td>
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</table>

**Figure 3: Exemplary cases for webbed customer innovation**

Analyzing the case studies, we state the following assumptions:

- Successful examples show that the concept of webbed customer innovation could work for all stages of the innovation process (see discussion below). Webbed customer innovation may not work only in the early and late stages (idea generation and concept proofing, respectively), but could be also a feasibly concept within the middle stages of the innovation process (prototyping).
• Not only lead users or advanced customers seem to be able to deliver high quality input for new product development. Also “ordinary customers” can have the competence and ability of being innovative.

• Successful webbed customer innovation in business-to-consumer industries is not straitened to specific branches or product characteristics. User driven innovation tools could be used for jewelry as well as computer games.

• Customers are often highly motivated for being integrated in the innovation process of companies even without financial rewards.

• Companies are using dedicated tools (often internet based systems) to perform webbed customer innovation. These tool-kits enable customers to both express their input and to find creative ideas for a desire or need. The success of an initiative to perform webbed customer innovation is depended from the performance of these tools.

5. Towards a framework for webbed customer innovation

As both the literature review and the case study research have shown, several varying research directions and understandings concerning successful webbed customer innovation can be found. Nevertheless, webbed customer innovation seems to show a lack of systematisation. Often, mere descriptions and enumerations of different kinds of user-driven innovation tools can be observed. Figure 4 provides an overview of various tools for webbed customer innovation. Another aspect of lacking systematization is the role of the innovating customer. While some authors highlight, for example, the contribution of the customer as the most critical success factor of webbed customer innovation (Cooper 1995; Engelhardt 1999), others identified the customer characteristics to be most important (Brockhoff 1998). While research often focuses on just one success variable, assignments to other critical success factors are neglected.

<table>
<thead>
<tr>
<th>Survey</th>
<th>Testmarket</th>
<th>Lead-User-Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reclamation-Management</td>
<td>Community</td>
<td>Group Discussions</td>
</tr>
<tr>
<td>Idea Competition</td>
<td>Tool Kit</td>
<td>Brainstorming</td>
</tr>
<tr>
<td>Workshops</td>
<td>Configurator</td>
<td>Customer Idealized Design</td>
</tr>
<tr>
<td>Concepttest</td>
<td>Open Source</td>
<td>Focus Groups</td>
</tr>
</tbody>
</table>

*Figure 4: Observed tools for webbed customer innovation*
Given the lack of systematization in the literature, we will develop in the remaining of this paper a framework for webbed customer innovation. Our objective is to classify various webbed customer innovation tools in a more systematic way. Using the findings of literature review and case study explorations, we have identified three important dimensions, which will be discussed in larger detail in the following:

- (the use of the tool) in a particular phase of the innovation process,
- the nature of the customers’ contributions, and
- the characteristics of the integrated customers.

5.1 Phase of innovation

“The innovation process can be divided into temporal segments, whereas the procedure of problem solving noticeably differs in each phase” (Hausschildt 1997). On the one hand this statement postulates a clear differentiation between the actions in each phase, on the other hand an exceeding distinction should be avoided (Gruner, Homburg 1999). Within innovation research, a huge amount of different (mostly linear) models can be found. The number of phases differs from three (Thom 1976) up to 67 (Gisser 1965, Saren 1994). Most models can be easily transferred one in another. We will use in the following a phase model based on the findings of Crawford (1994), Holt (1988), Myers/Marquis (1969), Trommsdorff/Schneider (1990) and Lüthje (2000). Also, Biemans’ (1992) claim that each phase contains construction as well as test, evaluation and decision was taken into account. As a result, we divided the innovation process into four phases: idea, concept, prototype and market (Figure 5).

![Figure 5: Phases of webbed customer innovation](image)

**Idea:** In this first stage of the innovation process, companies expand their knowledge base and access information in order to increase the number of new product and new process ideas. A variety of ways exists of doing this, ranging from mining research labs to soliciting creative inputs from manufacturing, marketing, customers and suppliers. After generating a bundle of alternative ideas for new products the second challenge is to screen them to focus resources on the most attractive opportunities. This
process is based on a set of screening criteria that fit the company’s technological opportunities while making effective use of its development resources in meeting strategic and financial needs (Wheelwright, Clark 1992).

**Concept:** At the concept phase of the product development process potential ideas are transformed and conceptualized within a product concept review in terms of bundling all current technical, organisational and economic pieces of information. Based on this, feasibility studies are carried out and chances and risks of the new product development are balanced. Early screens tend to be primary technical in nature, focusing on technical feasibility and proof of concept. Later screens then shift to emphasize manufacturing feasibility and fundamental economics (Wheelwright, Clark 1992).

**Prototype:** Potential new products, which meet the requirements of the concept review are prototyped in this stage of the product development process. A real functional mock-up model is built prototypically. The prototype should meet the requirements of comprehending all specifications of the concept-phase, working exactly under real world conditions and being producible with given budget (Horvath et al. 1994). As commercial production draws near, screens include added consideration of specific customer preferences, distribution channel concerns and financial return expectations.

**Market:** In a last step, successful prototypes are transferred into the mass production process. Test – and pre-test markets are used to reduce uncertainty about entrance, sales-forecast and additional marketing objectives. After the market introduction companies focus e.g. on improving the quality and/or lowering the production costs of existing products to stay competitive. Further, new ideas for product modifications or fine tunings are generated.

### 5.2 Contribution of the customer

As stated above, tools for webbed customer innovation include customers within numerous activities of contribution. Nevertheless the actual contribution of the customer is specified only by a few authors (Engelhardt 1999, Gruner, Homburg 1999). We have identified three different kinds of customer contributions: decision, information and creation. Figure 6 shows a classification of webbed customer innovation tools according to these categories.
Within decision activities, customers are only able to decide or evaluate given facts. Besides dichotomous decisions (e.g., yes/no), customers are able to assess the potential of a product idea, concept, or prototype on the basis of e.g., nominal scaling. Additionally, given products can be ranked corresponding to the customers’ preferences. Closed-questionnaire surveys or standardized voting present examples of decision-based customer contributions.

Information refers to the possibility that customers are able to articulate preferences or solutions regarding a specific challenge of the product development process. In doing so, customers are not restricted to pure decision-making. Giving information allows customers to express their personalities, needs, preferences, or solutions to a specific problem. Thus, giving information offers customers a much higher degree of freedom in terms of the possible solution space. Focus groups, idea competitions, or feedback hotlines are examples of information-based customer contributions.

Creation implies that customers are able to be creative on their own in the way that instead of giving information or deciding how to solve a specific innovative challenge, customers come up with their own creations as a solution. In doing so, customers become real co-designers. First prototypes, which are built by customers or toolkits for the configuration of products are examples of creation-based customer contributions.

### 5.3 Customer characteristics

Customer characteristics refer to specific attributes, which qualify customers for being successful contributors in terms of an integration in the innovation process. Following the approach of Lüthje (2000), application and object knowledge of customers are the two dominant customer characteristics.

**Application knowledge** refers to practical experience with a product through intensive usage. Professional runners for instance have a high application knowledge in using (and possibly co-
designing) running shoes. **Object knowledge** focuses not on practical experiences with a product, but on knowledge concerning e.g. the technology, procedure or material of a product (physical conditions of the product and how single components work together coactively). Remaining with running, customers with high object knowledge know about the complexity of designing the shoe (e.g. materials and technology). While Lüthje (2000) argues that only advanced customers with high application and object knowledge qualify for webbed customer innovation, our exploration showed that it is not just the advanced customer, who is able to deliver high quality input for innovations. Thus, using the attributes of object and application knowledge, we are able to identify four different customers, which will be classified according the Figure 7 as freshman, nerd, intuitive and pro.

**Figure 7: Customer characteristics**

Taking the example of innovation for running shoes, **freshmen** are customers with low application and object knowledge. These customers wear running shoes for fashion purposes. Further a freshman knows little about the complexity of building a shoe and the technology behind it. A **nerd** (high object knowledge, little application knowledge) seldom wears running shoes for sporting, but due to e.g. special studies the nerd knows about the complexity of special running materials and technologies. **Intuitives** (high application knowledge, little object knowledge) are passionate runners, nevertheless with little knowledge about technology and materials. Finally, **pros** (high application knowledge, high object knowledge) are also passionate runners but, differing from intuitives, they possess a strong technological background.
5.4 The Customer Innovation Cube (CIC)

With the objective of providing an integrated approach of customer integration – a framework, which renders a systematisation of webbed customer innovation tools – we are now able to pool the three dimensions of webbed customer innovation (phase of innovation, contribution of the customer, customer characteristics) together to a three dimensional matrix, which we coined the “Customer Integration Cube (CIC)” (Figure 8). As the CIC unites all three dimensions, which were identified as being important, when talking about webbed customer innovation, all kinds of webbed customer innovation tools can be classified on a consistent basis. Figure 9 classifies the examples presented above (Figure 3) within this framework.

![Figure 8: The Customer Integration Cube](image)

Using the CIC, one has to answer the following questions:

1. Which input of the customer has been identified to be crucial for the innovation success of a company (e.g. ideas for new products)?
2. Which stages of the innovation process (idea, concept, prototype and market) are affected?
3. Which customers possess the critical knowledge identified in step one in terms of freshman, nerd, intuitive and pro?
4. How could the identified customers first-best deliver their knowledge regarding the different customer contributions of decision, information and creation?
Using the CIC as a classification tool and evaluating the position of a particular case within this framework demands a high degree of discussion and dialogue within either a firm or a research team helping to see the challenge of webbed customer innovation in a more structured way. The following chapters will explore the potential of the CIC through applying this concept to SpoCo, a large manufacturer of sporting products.

<table>
<thead>
<tr>
<th>CIC</th>
<th>3M</th>
<th>Anti-Aids-Campaign</th>
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<tbody>
<tr>
<td>Customer Integration Cube</td>
<td></td>
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<tr>
<td>Systematization of selected products</td>
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**Figure 9: CIC systematisation of selected webbed customer innovation tools**

6. Exploration of the CIC at SpoCo

To explore the potentials and possible drawbacks of the systematization approach presented above, the CIC is applied to SpoCo, one of the largest manufactures of sporting products (shoes, textiles, equipment). SpoCo is deeply weaved into a value web consisting of a huge amount of retailers, subsidiaries, suppliers, key-account partners, research institutes and customers. Our research builds on a long-term cooperation with SpoCo, which represents a stable backbone of our project giving access to current management problems and strategies within the value web, thus, opening up an exciting field not only for exploration, but also for piloting and evaluating experimental solutions of webbed customer innovations.

The exploration at SpoCo was conducted with the help of semi-structured expert interviews. The experts were selected from different departments of SpoCo, which were identified as most important for webbed customer innovations in a moderated all-day workshop with the head of marketing and the research group members.
SpoCo experts interviewed for case exploration

Figure 10: SpoCo experts interviewed for case exploration

The dimensions of the CIC were applied as guidelines for the interviews to get to know the innovation process within the value web and to elicit the state of practice at SpoCo’s attempts of webbed customer innovation. In the following, the central statements are listed not naming the particular subjects for anonymity reasons.

SpoCo is dealing in a highly competitive market, which developed far above average over the last years. Competition and ever shortening product lifecycles force SpoCo to innovate continuously new products or modify existing ones. Referring to the innovation phases it was stated:

“You are looking at a so much mature industry. Running shoes for example have been in huge mass production for almost 30 years. We are forced by steadily shortening product life cycles. About six years ago the average product life cycle was lasting three seasons. Today our products degenerate at least after one season and this is not the end of the story.”

Thus, for SpoCo innovation appears to be the most critical success factor in business:

“Innovation at SpoCo can be a new technology or a new construction. Further it can also just be a completely different idea like geometry or a really new application. There are different levels: technical innovations, innovations for lower price points due to added consumer relevant details.”

Asked for the customer characteristics dimension of the CIC executives at SpoCo stated:

“We deal with different kinds of people buying shoes. There are real sports people, kind of daily sports people, fashionable and casual sports people. Each person can have a slightly different innovation with different levels what they expect. Further it is not always an innovation, it is sometimes like an evolution or fine-tuning. In the short term we focus on improving existing innovations while radical innovations are based on a new technology - for example a new material.”

Differing slightly from the CIC’s generic innovation phases, the process at SpoCo follows the stages of idea generation and evaluation, concept, prototyping, production and market introduction:

“Idea generation and evaluation starts with a brand strategy meeting, coming up with ideas and requirements. Those ideas can come from different places. Usually we just do an evolution of the last stuff we have done. So 2004 we do an evolution of the stuff we have done 2003. The biggest input comes from our subsidiaries. Their input comes from the retailer, trend magazines, competition and their own analysis of what the consumer is buying. The next biggest factor is we. Our info comes from the same people. The last big input is from senior management. The second kind of products we do are new products and those are based on a number of different factors, sometimes on an entirely new technology.”
Those technologies are developed by the SpoCo innovation team (SIT), a technology spin off outside the “inline” commercialization cycle of SpoCo. The SIT is not “inline” process orientated, but with a maximum degree of freedom:

“If we come up with an innovation, this innovation is always performance or technical orientated. We are not bound to the calendar of the inline product development process. Our work is long run orientated. We develop concepts and things sometimes years before commercialization.”

In a next step the generated ideas are transformed into a product concept, at which financial details, brand information and product strategies are taken into account. The conceptualization ends with a senior management presentation, where decisions according to the assortment are made. In the following prototype phase chosen concepts are produced in Asia as real mock-ups. Asked for webbed customer innovation tools and the customer contribution dimension of the CIC, it was stated:

“We work with athletes, who are used to prototypes. We take a lot of prototypes out and we show them. The level of those users is quite good. Getting is pretty good. Further we do focus groups. For example we picked six coolest kids from six schools in New York. We showed them our stuff, explain the technology and ask for feedback.”

Due to the increasing pressure of competition and shortening product life cycles, SpoCo is looking for new ways of generating innovations. Although SpoCo regards the subsidiaries and retailers as primary customers, a contribution of the (end-) consumer into the innovation process is considered as an appreciated source:

“An integration of the customer (=consumer) in the innovation process would make sense. For example you can come up with a new product idea, show consumers sketches and describe the products. You can do that when you get your first prototype back, get feedback on the product and the innovation and incorporate that. It is a great way to tap into knowledge and information that your consumers give.”

Motivation of consumers for playing a more active role in the innovation process is expected to be high.

“Consumers want to be integrated in the innovation process. We can see that on the feedback we get through emails. We have very passionate consumers. They love us. Sport is a very emotional thing.”

Although webbed customer innovations are seen as a promising way at SpoCo, the analysis with the help of the CIC has revealed that the company has undertaken little effort to implement webbed customer innovation tools so far. Finally it was conceded, that consumers with innovative ideas have:

“... no open line !”
In consequence the application of the CIC has uncovered several lacks at SpoCo’s webbed customer innovation attempts and following conclusions can be drawn:

- Customer integration at SpoCo takes only place at a single stage of the innovation process (prototype phase), using focus groups and prototype tests.
- At this, SpoCo is relying only on specific customers. Attendants of prototype testing are professional athletes (pros) while participants of focus groups (e.g. six coolest kids) are style leaders and opinion formers (intuitives).
- The contribution of those customers within the innovation process of SpoCo is reduced on evaluating given facts (decision) or articulating preferences or solutions regarding a specific challenge of the product development process (information). So far, SpoCo offers the participants no possibility of being creative themselves.
- This lack is accompanied by the fact, that SpoCo does not exploit the potential of innovative Information and Communication Technology sufficiently, since web-based customer integration tools, which enable customers for being creative, are not applied at all.

Figure 11 classifies SpoCo’s current webbed customer innovation tools:
Based on these results the research team has conducted a moderated workshop with all interview partners. The questions we have derived from the CIC (see page 17/18) were used as guidelines for fruitful dialogues and discussions. The central findings can be summarized as follows:

1. **Which input of the customers has been identified to be crucial for the innovation success of SpoCo?**
   
   Suggestions for new products and designs as well as input for product and design improvement have been identified as most important for webbed customer innovations.

2. **Which stages of the innovation process (Idea, Concept, Prototype, Market) at SpoCo are affected?**
   
   Suggestions for new products and designs address the idea and concept phases whereas product and design improvements affect the prototype- and market stages of the product development process.

3. **Which customers possess the critical knowledge identified in step one in terms of freshman, nerd, intuitive and pro?**
   
   All types of customers at SpoCo (freshman, intuitive, pro, nerd) are considered to possess individual, critical knowledge for new products and designs as well as for product and design improvements.

4. **How could the identified customers first-best deliver their knowledge regarding the different customer contributions of decision, information and creation?**
   
   Different customers (freshman, nerd, intuitive and pro) have different abilities to deliver innovative input. For this reason SpoCo should not rely on a tool offering just a single possibility of customer contribution. Customers are considered not only to give information or make decisions concerning new or improved products and designs, but also have the possibility to be creative in order to exploit the varying capabilities of different customers.

**7. Further Research Direction**

Based on the findings of our exploration we are currently in the process of developing and implementing a webbed customer innovation tool for SpoCo, which will be piloted at the company in Quarter 3 and 4, 2003. The tool should enable SpoCo to tap into the knowledge of its customers in order to receive high quality input for new products and designs as well as for the improvement of
existing products and designs. The webbed customer innovation tool is considered to fulfil the requirements of being accessible to all customers of SpoCo, offering them decision-, information- and creation-possibilities to express their innovative solutions, covering every stage of the innovation process. In doing so we aim to verify the assumptions, that customer integration works for all stages of the innovation process of a company (idea, concept, prototype, market) and that all kinds of customers (freshman, nerd, intuitive, pro) possess critical knowledge for innovations, which can be contributed not only by giving information or by making decision, but by being creative. Early results from this piloting phase are expected to be delivered in early 2004.

References


