Obtaining and Leveraging Customer Knowledge for Customer-Oriented Products

- A State-of-the-Art View of Strategies and Methods

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Abstract

The purpose of the theoretical part of this dissertation is to provide an overview of existing strategies and various methods which can be utilised by companies to obtain and leverage customer knowledge. The goal of the survey conducted in the empirical part of the paper is to give a state-of-the-art view of how companies within selected industries and geographic regions involve (potential) users of their products in the innovation process. Further, the international survey aims at giving the reader insights as to the question whether there are any striking industry-specific or region-specific differences with regard to the use of instruments for obtaining customer knowledge presented beforehand. As to geographic differences with respect to customer involvement the survey does not allow to draw conclusions. Concerning the diffusion of the methods in the chosen industries the research indicates notable differences.

Keywords: user innovation, customer knowledge, innovation management, lead user model, toolkits
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Appendix
1. Introduction

In an environment characterised by heterogeneous and dynamic customer needs, highly competitive markets and the continuous development of new technologies, companies must learn to act more quickly and accurately when improving existing products or creating entirely new ones. Additionally, the pressure to innovate is increased by the fact that companies in Western countries face higher costs than their counterparts in developing countries. Consequently, technically advanced and innovative products are becoming more and more critical to success.

This section begins with a presentation of the general topic, followed by an elaboration of the research problem, the purpose, the research questions and, finally, the limitations made with respect to the research.

1.1. Background

*If we only knew what our customers know.*

Knowledge Management (KM) has been the subject of much discussion over the past decade. Organisations and companies are told that they will not survive in the modern knowledge era unless they have found a way to manage and leverage the knowledge circulating in the company and its environment. Authors like Drucker (1993), Toffler (1990) and others have foreseen knowledge to become the most important resource in the “knowledge society”. Knowledge management as a discipline emerged around 1994. It is said that it came into existence during the discussions between business professionals who gathered to discuss potential benefits of sharing knowledge. Ground-braking was Nonaka’s and Takeuchi’s “The Knowledge Creating Company” published in 1995. Boisot (1998), von Krogh, Ichijo and Nonaka (2000) and other authors provide concepts about how knowledge can be created in organisations and used for competitive advantage. Although much has been written about knowledge management within the company, research about external sources of knowledge and innovation, especially the customer, has been somewhat neglected.

Several researchers have found users to be the developers of many or the majority of commercially successful industrial innovations in a range of fields comprising both high-tech and low-tech industries (Enos 1962; Knight 1963; Freeman 1968;
Shaw 1985; von Hippel 1988). Moreover, recent empirical studies have shown that user innovations also occur in the consumer goods area, including mountain bikes (Lüthje; Herstatt & von Hippel 2002) and a number of other sports-related fields (Shah 1999; Lüthje 2002; Franke & Shah 2002).

1.2. Problem

Traditionally, companies rely on customer data gained through different instruments provided by market research when developing new products. Market research is passive, slow and often costly, though. Market research tools are largely incapable of sensing emerging customer needs and do not take customers’ own experiences and ideas duly into account. Therefore, those tools are inefficient in the instance of novel products and product categories facing rapid changes. Additionally, customers may be unable to verbalise what they actually want (von Hippel 1986). Companies (especially those operating in the consumer goods market) relying solely on interviewing customers about their needs and their opinions about new products often fail when introducing novel products. Although studies have shown that customers might be very innovative (see section 1.1) and that customer integration particularly in the early stages of product development has proven to be successful, there is a clear deficit in customer integration (Homburg & Gruner 1996). Also, modern communication and information technologies provide new ways of substantially reducing costs and time needed for active market research and product development (Dahan & Hauser 2002). We therefore contend that traditional market research instruments should be complemented by more (inter)active methods of acquiring and capitalising on customer’s knowledge. Instead of exclusively relying on knowledge about the customer when improving existing products or creating new ones, companies should take steps to gain knowledge of the customer as well. Integrating the customer into product development requires a shift in mindset (Gurgul, Rumyantseva and Enkel 2002). It means questioning the validity of basic attitudes and assumptions about the customer. It means that employees think of customers as equal partners, as co-creators with a common interest. In addition to creating products that are really wanted and needed by customers,
involving users of a company’s products in the innovation process may benefit the seller-buyer relationship as well.

1.3. Purpose

We attempt to create a cross-regional and cross-sectional view of the customer’s role in the innovation process. Further, we analyse if any significant differences exist with regard to a company’s business sector or geographic origin. Lastly, we seek to give an interpretation and explanation of the responses received from the interviewed companies.

1.4. Research Questions

The research aims at learning more about the following questions:

1. Do companies already understand and accept the customer as a (potential) source of innovation?
2. Where do the innovations of companies originate? Can a pattern regarding the different sources of innovations be identified?
3. Do companies involve customers in the process of product development? Are there any industry-specific or region-specific differences with respect to this question?
4. Which approach/method do they use in order to obtain and leverage customer knowledge? Do they use the methods/tools discussed in the literature?
5. Do companies encourage/motivate their customers to contribute to new or better products?
1.5. Limitations

It can be assumed that companies serving industrial customers take a very high interest in giving their clients a product exactly matching their mostly sophisticated demands since products on industrial markets are often rather complex, sometimes even unique. Therefore, one of the research objects are companies operating in the business-to-business market. More specifically, companies producing flavours and fragrances and those active in the automotive industry will be analysed.

In some instances customers on the consumer goods market have highly specific demands as well. This is true for products which highly involve consumers personally and emotionally, e.g. cars, sports equipment or entertainment electronics. This is why the research is directed to companies producing these high-involvement/high-interest products as well.

Due to the peculiarities of services\(^1\), service companies are excluded from our research.

Furthermore, the research will be limited to mid-sized and large companies, since due to their financial resources it can be assumed that these companies can choose from a larger set of methods and instruments for obtaining and leveraging customer knowledge than small companies. In general, mid-sized companies have been preferred to large concerns since it can be assumed that in less complex medium-sized operations with fewer products or product categories the person(s) capable of answering questions concerning the product development of a specific product or product category should be easier to identify.

\(^1\) Service products are produced and “consumed” simultaneously. The quality of the “product” depends on the interaction between the service provider and the customer and is subjective. Due to this interplay it may be difficult to clearly identify the features of a service as a product and the sources of innovations occurring in this interactive process.
2. Research Methodology

In this section we reflect on the methodology used for conducting the research. A discussion of the choice of methodology will be followed by the research process which includes the research philosophy and the research approach.

2.1. Choice of Methodology

The issue discussed in the paper is, that even though early thinkers, management consultants and academic researchers have written or argued about new approaches to innovation management we still do not know to what extent the new approaches are implemented in the existing firms’ innovation processes. Taking into consideration the existing literature and baring in mind the purpose of the dissertation, namely to give a better understanding of the current situation regarding strategies and methods for customer involvement in innovation processes, our work is influenced by the principles of positivism. Also, we preferred to work with an observable reality. Furthermore, we intend to render a detached interpretation of the collected data.

On the other hand we argue that the social world of business and management is far too complex to lend itself to theorising by definite laws in the same way as physical sciences (Saunders, Lewis and Thornhill 2003) which lead to a certain degree of interpretivism. The chosen research approach is mainly a deductive one based on the existing literature, proceeding independently from what was to be observed with a view to generalise the findings in the end. However, it should also be mentioned that some inductive elements can be found as well which should allow us to better understand the complex matter of creating successful new products. In our opinion the best research strategy to face the goal of the paper would be to conduct a survey.

The paper focuses on various strategies and practices which allow companies to obtain knowledge of their customers in order to co-develop commercially successful products. The presented techniques are derived from contemporary literature research. The aim of the empirical research is to learn whether these approaches are used by companies in selected industries and to what extent they are disseminated within the chosen business lines and regions.
2.2. Choice of Theory

The paper deals with knowledge of the customer and new ways of gaining and utilising it. In order to understand the different facets of knowledge and its creation, the first section of the theoretical framework outlines the basic meaning of knowledge and gives a short retrospective view from Plato to nowadays by briefly introducing the main epistemological traditions and how the meaning attached to knowledge in modern society evolved in western society. Before proceeding with basic theories concerning the object of this paper, we discuss the beginning of the understanding of knowledge and the link between knowledge and economic affairs.

In order to facilitate the understanding of the theoretical framework, we want to introduce a pyramid framework with a broad foundation, a middle part and a top. Elaborating on customer knowledge and how to gain it, we start with a cornerstone book in this area – “The knowledge creating company” (Nonaka & Takeuchi 1995), where the Japanese authors wrote about the knowledge conversion from tacit to explicit knowledge and vice versa and how this can be accomplished. They are the first ones to try to explain the transformation of knowledge and its impact on the company’s success. These thoughts are part of the basic level of the pyramid.

Global knowledge management and why knowledge is essential for successfully competing in the global marketplace is the complementary part of the pyramid’s ground level. Therefore, the importance of knowledge regarding the multinational enterprise referring to authors such as Ghoshal and Bartlett, Davenport and Hedlund will be described.

On the middle level of the virtual pyramid we put the knowledge of the customer as a source of innovations and present three strategies to gain and leverage it: Kundenwissensmanagement (Stauss 2002), the Customer Knowledge Management Concept (University of St. Gallen) and Five Styles of Customer Knowledge Management (Gibbert, Leibold and Probst 2002).

Finally, the various instruments/techniques for gaining customer knowledge constituting the top of the pyramid will be discussed: the Lead User Model by von Hippel, user communities and toolkits.

It should be mentioned that this paper does not only represent the ideas of the authors mentioned above but also employs a broad variety of other literature.
sources. However, the authors not referred to in this subsection and their works and thoughts were important to tailor this paper and gave us a deeper understanding of the work in the area of knowledge management.

2.3. Research Process

The following section contains an elaboration of the chosen approach to collect data and, beforehand, the thoughts and ideas underlying that approach.

2.3.1. Research Philosophy

The research philosophy reflects the way one thinks about the acquisition and development of knowledge and the way one goes about doing research. The research philosophy chosen for this work is a mixture of the principles of positivism and interpretivism, positivism being the predominant one. We prefer working with an observable social reality, but we do not assume that the end product of the research can be law-like generalisations similar to those produced by physical and natural scientists. As researchers in this tradition we assume the role of objective analysts and render detached interpretations of that data which has been collected in an apparently value-free manner. On the other hand our research philosophy is partly influenced by interpretivism, agreeing with the view that the social world of business and management is far too complex to lend itself to theorising by definite laws in the same way as the physical science (Saunders et al. 2003).

2.3.2. Research Approach

Since the purpose of the research conducted in this work is to find out whether certain techniques and strategies to gain knowledge of the customer are used and disseminated among selected industries and regions we take the view that the deductive method combined with some inductive elements will best serve the aim of the dissertation. The research is partially deductive because it is founded on
existing literature dealing with customer knowledge. It is partially inductive as well since it aims at drawing conclusions from the responses obtained in the survey.

Induction and deduction actually do not occur in isolation but some combination does occur (Johnston & Pennypacker 1980). Johnston and Pennypacker called this combination a fusion of induction and deduction. They also argue that science essentially involves the combination of the two and does not advance using a single strategy of logic. However, it should also be mentioned that the research topic is relatively new leaving a lot of place for new findings and further research.

Having read literature about research methodology we found that choosing a rather deductive approach one should employ quantitative methods such as questionnaires. Following the advices given to us from the literature and also from our tutor, a self-administered questionnaire has been rendered. The advantage with a questionnaire is that every recipient receives the same set of questions and we do not have any influence on their answers since respondents will not be biased by our behaviour or facial expressions which might signal satisfaction/dissatisfaction with the answers. In our case a high number of participants answering the same set of questions is needed to be able to compare the answers and to allow generalisations to some degree. However, it should be mentioned that qualitative data is also included in the study because some open questions were used in order to give respondents the freedom to bring in some new thoughts and to answer in a way that we might not have foreseen.

Since the response rate to our e-mail questionnaire turned out to be unsatisfactorily low, we decided to conduct telephone interviews in addition. The semi-structured interviews made on the phone have both advantages and disadvantages. On the one hand they contributed to sort out misunderstandings connected to the questions and to go deeper into some questions if we got interesting answers. Also, talking to employees of a company in person ensures that the most competent person will be interviewed. On the other hand the bigger variety of answers received in the phone interviews tends to limit the ability to generalise the findings. A general disadvantage with questionnaires and telephone interviews is that it might be difficult to formulate the “right” questions capable of yielding answers to the research questions. In addition, the time chosen for
conducting the interviews (shortly before Christmas holidays) might have been inconvenient for some companies.

A deductive method was pursued because of its primary advantage, namely that deductive logic has an explanatory power. Furthermore, deductive logic enables researchers to provide evidence that can increase the confidence in a theory. Although deductive knowledge has several advantages, there are some limitations worth mentioning. First, deductive logic partly locks the researcher into testing certain already existing constructs or ideas. Second, a deductive approach to science cannot be conducted by itself. Deductive conclusions are essentially elaborations on previous knowledge. Hence, it cannot be a source of a new truth (Martella et al. 1999).

Criticising the inductive method, it can be argued that: (a) the future will not likely be exactly like the past, (b) a limited number of tests or observations will not provide enough evidence to allow a universal picture to be drawn and (c) there is no justification for inductive inferences (i.e., making generalised statements based on limited data) (Martella et al. 1999).
3. Theoretical Framework

Commencing with a philosophical retrospective on the nature and acquisition of knowledge, the following subsections will explain the economic importance of knowledge, how it can be created and distributed throughout the whole organisation, proceeding with reflections on the role of customer knowledge for companies’ innovation processes as well as customers’ motives for contributing to product development. The section concludes with the presentation of various strategies and methods for obtaining innovation-relevant customer knowledge.

3.1. Historical Background

The history of Western philosophy since the period of the Greeks can be seen as the process of searching for the answer to the question, “What is knowledge?” Despite the fundamental differences between the two basic epistemological traditions rationalism and empiricism, Western philosophers have generally agreed that knowledge is “justified true belief”, a concept introduced by Plato in his *Meno, Phaedo, and Theaetetus.*

Proponents of rationalism argue that true knowledge is not a product of sensory experience but some ideal mental processes. Supporters of rationalism contend that knowledge can be attained deductively by appealing to theoretical constructs such as concepts and laws. In contrast, empiricism claims that there is no such thing as a priori knowledge and the only way of obtaining knowledge is through sensory experience. Empiricists contend that knowledge is derived inductively from particular sensory experiences. Since Plato has set the foundation stone there have been plenty of disputes between the different supporters, i.e. Plato vs. Aristotle or Descartes vs. Locke until the eighteenth century when Immanuel Kant built a bridge between these schools of thought. In his words: ”Though all our knowledge begins with experience, it does not follow that it all arises out of experience”. Georg W.F. Hegel followed this path arguing that everything originates from the “absolute spirit” through a dynamic process. Karl Marx made another attempt at combining rationalism and empiricism by integrating Hegel’s dynamic process and the emerging social sciences (Russell 1961, 1989; Moser & Nat 1987).
Alfred Marshal, a forefather of today’s tradition of neoclassical economics was among the first to state the relevance of knowledge in economic contexts. According to Marshal (1965), “Capital consists to a great part of knowledge and organisation. […] Knowledge is our most powerful engine of production”. Frederick von Hayek (1945) and Joseph A. Schumpeter (1952) paid attention to knowledge in economic affairs as well. The Austrian economists argued that knowledge is “subjective” and can not be regarded as a datum. Hayek was one of the first thinkers to highlight the importance of implicit, context-specific knowledge. He categorised knowledge according to its suitability to standardising: while scientific knowledge is law-like, context-specific knowledge is relevant depending on a particular time and place. They conclude that, consequently, the relative value of knowledge of the latter kind has to be continuously reassessed according the current circumstances.²

### 3.2. Contemporary Literature on Knowledge

Society has always been subject to changes and evolution. The manufacturing-based industrial society has evolved into a service society (Quinn 1992) and more recently into a society based economically on information or knowledge. Leading management thinkers foresaw that not only the information sector, but also the manufacturing and service sector will be based on knowledge in the coming age and that companies will develop into creators of knowledge.

It is often argued that knowledge is a decisive prerequisite for the functioning of the late modern economies (Tsoukas 2002). According to Drucker (1993) we are entering the “knowledge society” in which” the basic economic resource is and will be knowledge” and no longer capital or natural resources. He suggested that for organisations in the emerging knowledge society one of the most central challenges is to continuously renew themselves. They have to be prepared to discard knowledge that has become obsolete and learn to create new things through: (1) ongoing improvement of every activity; (2) creation of new applications from earlier successes and (3) an organised and continuous innovation process (Nonaka & Takeuchi 1995).

² It should be clearly pointed out that the ideas and thoughts in this section have been taken from
Before proceeding with Nonaka’s and Takeuchi’s cornerstone book (1995) about organisational knowledge creation, we would like to mention Michael Polanyi (1962, 1966) (Polanyi & Prosch 1975), a chemist turned philosopher. He is the inventor of the concept of “tacit knowledge” and the phrase “we can know more than we can tell”. According to Tsoukas a crucial point of Polanyi’s work is his insistence on overcoming commonly held dichotomies such as “theoretical vs. practical knowledge, sciences vs. the humanities or to put it differently, his determination to show the common structure underlying all kinds of knowledge” (Tsoukas 2002, pp. 3-4). He was categorical that all knowing involves “skilful action” and that the knower is actively involved in the process of understanding.

The term "tacit knowledge” has become very popular after Nonaka’s and Takeuchi’s The Knowledge Creating Company has been published. The gist of Nonaka’s and Takeuchi’s theory of organisational knowledge is the transformation of knowledge- the conversion of tacit knowledge into explicit knowledge and vice versa. They contend that "our dynamic model of knowledge creation is anchored to a critical assumption that human knowledge is created and expanded through social interaction between tacit knowledge and explicit knowledge. We shall call this interaction ‘knowledge conversion’” (Nonaka & Takeuchi, p. 61).

Nonaka and Takeuchi distinguish four modes of knowledge conversion:

1. from tacit knowledge to tacit knowledge (socialisation),
2. from tacit knowledge to explicit knowledge (externalisation),
3. from explicit knowledge to explicit knowledge (combination),
4. from explicit knowledge to tacit knowledge (internalisation).

The conversion of tacit knowledge to tacit knowledge can be accomplished by observing, imitating and practicing, whereas the conversion of tacit knowledge to explicit knowledge can be achieved through concepts, models, hypotheses, metaphors and analogies. The combination of different parts of explicit knowledge can bring about the conversion of explicit knowledge to explicit

knowledge. Finally, explicit knowledge can be converted into tacit knowledge by verbalising and absorbing it, thereby internalising it.

Nonaka and Takeuchi describe the process of organisational knowledge creation as being not only cyclic but spiral-like because, according to the authors, the level of knowledge becomes deeper and deeper each time one enters into a new cycle. A cycle is subdivided into five phases: (1) Tacit knowledge is shared by team members; (2) Concepts are created by means of a joint mental model; (3) The concepts are judged in accordance with the basic organisational goals; (4) An archetype is built representing the features of the justified concepts; Lastly, (5) the new knowledge is “cross-levelled”, thereby allowing new cycles of knowledge creation to be developed elsewhere inside or outside a company (Nonaka & Takeuchi 1995).

One of the salient findings of this book is that external knowledge can be leveraged to develop new products. Thus, obtaining and evolving external knowledge can be seen as a competitive advantage.

Strategies for managing knowledge can be categorised broadly into codification and personalisation approaches (Desouza & Evaristo 2002). When following a codification strategy, knowledge residing in individuals is centrally collected and brought in a coherent context. It is made accessible to all employees within the company by using databases and data warehouses. The codification strategy works best when that knowledge can be satisfactorily extracted and codified. In contrast to this highly structured approach to knowledge management the personalisation strategy is only semi-structured. The latter strategy assumes that hard-to-standardise knowledge is shared predominantly through person-to-person contacts (Desouza & Evaristo 2002). The personalisation strategy obviously meets best the preconditions for obtaining implicit or tacit knowledge residing in customers’ minds.

### 3.3. Global Knowledge Management

“Knowledge management is the conscious and active management of creating, disseminating, evolving and applying knowledge to strategic ends” (Berdrow and Lane 2003, p. 1).
In today’s highly competitive marketplace the organisations must compete globally in order to survive. As Birkinshaw (2000) recognises, it is essential for the enterprises to manage not only tangible resources but also to exploit intangibles since traditional sources of advantage such as distinct market positioning or access to non-imitable resources are diminishing. Today’s competitive advantage is, according to Birkinshaw, “better viewed as a dynamic capability –a function of the firm’s ability to innovate, learn, or continuously reposition itself more effectively than its competitors (e.g., Teece, Pisano and Shuen, 1997)” (Birkinshaw 2000, p. 1).

Bartlett and Ghoshal (1989) draw attention to four strategies for competing across borders: multinational, global, international and transnational. (1) A multinational strategy is one in which foreign subsidiaries run nearly independently or as a loose federation. Going independently allows subsidiaries to be responsive to developments in local markets. (2) A global strategy is one in which the activities of the subsidiaries are strictly controlled by the home office. The overall goal of this strategy is to gain benefits through economies of scale. (3) The international strategy aims at leveraging the knowledge of the parent company by spreading and adjusting it throughout the organisational entities. (4) The relatively new transnational strategy follows the motto ”think global act local”. This is possible using dynamic interconnection between the home company and the subsidiaries. Companies applying this strategy dovetail their efforts and combine regional adaptability with the benefits of an integrated and efficient global concern (Desouza & Evaristo 2002).

Hedlund (1986) argues that drivers of change are rather internal than environmental. He envisaged the multinational enterprise (MNE) as a ‘meta-institution’ that has the resources as well as the incentives to trigger experimentation and learning in its dispersed units, within and across units. Also, organisations must find ways of integrating dissimilar sources of knowledge found within the boarders of the company, thereby maintaining a competitive advantage (Desouza & Evaristo 2002). Furthermore, Desouza and Evaristo refer to Chiesa and Manzini (1996) who carried out a study about what kind of instruments and mechanisms to transfer technical knowledge are employed by multinational companies. The answers include forums, electronic linkages cross-boarder assignments, flows from staff to other departments and country spanning
tasks. According to (Nohria & Ghoshal 1997) knowledge should not only be sought internally but also externally through differentiated networks of formal and informal alliances. The MNE is not simply an internally integrated network, but an extended network with a multitude of linkages as well. In order to keep up with competitors a lot of companies have shifted their focal point from internal innovation to a range of outside sources such as customers, suppliers, research companies and institutions, business partners (networks/alliances, joint ventures) and institutions of higher education (Rugman & Brewer 2001). Linder, Jarvenpaa, and Davenport (2003) predict that the percentage of external innovation will grow even further over the next years. An innovation sourcing strategy should help companies to consider the ratio between internal and external sources and how to exploit them throughout the innovation chain. They noted several appealing benefits:

(1) In order to extend products and services companies can obtain new fields of expertise. Linder et al. 2003 give an example of how a relationship between a firm operating in the automotive sector partnered with a marine engine firm to develop a new cast aluminium engine block can be benefiting for both parties. The vehicle firm benefited from a light-weight, high-performance engine, and its partner established a new line of products for water craft. (2) Both companies were able to lower innovation-related costs and risks. (3) Executives interviewed in the study by Linder et al. have found that outside innovations also inspire employees. The managers believe that competition between internal and external ideas benefits their work. (Linder et al. 2003). Moreover, as Birkinshaw (2000) points out, studies have shown that external sourcing of research and development is more effective when done in combination with in-house R & D (Gambardella 1992; Rothwell 1992; Veugelers 1997).

Competing in the global marketplace means greater variety in sources of innovation. Firms have the opportunity to tap all kinds of external sources, from user communities to consortia of competing firms, thus establishing mutually beneficial relationships. To successfully implement knowledge management strategies, organisations must make efforts to change the mindset of employees “from sharing knowledge on a ‘need to know basis’ to ‘continuous sharing new insights’” (Desouza & Evaristo 2002, p. 7).
In our opinion last but not least the companies should identify the knowledge providers. One of the external sources of knowledge is the customer with his individual views, experiences, and insights. A company operating in the global arena must implement a strategy or approach to tap the knowledge of its customers. By doing this international enterprises can reap the benefits of obtaining (customer) knowledge at one place by disseminating it within the entire organisation.

3.4. The Customer as a Source of Knowledge

Knowledge has long been recognised as the primary value generator for cutting-edge companies. But this knowledge was largely sought within corporate boundaries. A new perspective on consumers enables companies to prospect useful knowledge outside company boarders—“customers are not dumb” (Enkel et al. 2002, p. 9). “Thinking of the customer as a source of knowledge requires a shift in mindset: it means treating the customer as a source of value for the company, not simply as a recipient of products and services” (Gurgul et al. 2002, p. 5). Alvin Toffler (1980) introduced the expression “prosumer” to underline that the customer could fill the dual roles of producer and consumer at the same time.

Gurgul et al. contend that the centre of knowledge seems to move from inside to outside company borders, requiring consideration of questions related to integrating customers or, at least, actively accessing the knowledge residing in customers. (Gurgul et al. 2002).

According to von Hippel at least two important factors will tend to drive the “locus” of problem-solving\(^3\) from the manufacturer towards the customer. “The first factor involves various kinds of agency-related costs that might drive direct beneficiaries of a new product or service design to ’do it themselves’” (von Hippel 1998, p. 3). The second factor is that customer knowledge relevant for problem-solving may be “sticky”. Von Hippel defines stickiness of a given unit of information as “the incremental expenditure required to transfer that unit of information to a specified locus in a form useable by a given information seeker.

\(^3\) the centre of problem-solving
When this cost is low, information stickiness is low; when it is high, stickiness is high” (von Hippel 1994, p. 3). He reasons that high information stickiness may be due to the characteristics of information itself such as the way in which it is encoded (Nelson 1982; Pavitt 1987; Rosenberg 1982) or, alternatively, “it may be a function of the absorptive capacity of those who seek information (Cohen & Levinthal 1990)” (Jeppesen 2002, pp. 3-4)

Additionally, during product-development processes numerous information iterations between consumers and manufacturers may be necessary to elaborate a satisfactory product concept since questions will appear that users did not think of prior to use (von Hippel 1994). In section 3.6, various approaches to overcome the difficult-to-transfer information problem will be presented.

3.5. Motives for User Innovations

In order to better understand why individuals or organisations other than the manufacturer would innovate, this section presents the motives for user innovations.

In his book *The Sources of Innovation* von Hippel (1988) shows that differences in the “functional source”\(^5\) of innovation may depend on differing expectations of innovation-related rents. Hence, if it is not attractive for a company to exploit an innovation, it would be unlikely to do so. The attractiveness of innovations may depend on (1) the ability to establish some monopoly control over the innovation, (2) the nature and amount of innovation-related output generated by innovating and non-innovating firms (3) the anticipatable cost of innovation and (4) the displacement of existing business that a firm undertaking the innovation studied might expect. According to von Hippel two conditions must hold to render an innovation economically unattractive for the innovating company: (1) It must be expensive for innovators to adopt new functional relationships to their innovations; (2) Innovators must have a poor ability to capture rent by licensing their innovation-related knowledge to others.

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\(^4\) For further information on the problem of difficult-to-transfer knowledge or information see section 3.2.

\(^5\) By “function” the relationship between the product and a company is meant. The company may be a supplier, a manufacturer or the user of a product.
Empirical research has shown that the ranking order of motives that drive customer involvement in product development processes varies between product categories, and includes intrinsic as well as extrinsic motives such as monetary rewards (Hansen & Raabe 1991). Table 3.5.1. provides an overview of potential motives for user innovations.

<table>
<thead>
<tr>
<th>Intrinsic motives</th>
<th>Extrinsic motives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concerning individuals</strong></td>
<td></td>
</tr>
<tr>
<td>need for a new product</td>
<td>re-imbursements reflecting the value of the suggestions</td>
</tr>
<tr>
<td>private or public honourable mentioning of being the originator of a product idea (which may impress one’s peer group)</td>
<td>price reductions on a limited number of future new products</td>
</tr>
<tr>
<td>proving creativity to oneself</td>
<td>early access to future new products, which may hold the promise of generating higher returns or lowering production costs</td>
</tr>
<tr>
<td></td>
<td>extra services during use of the new product (such as extended warranties, repair work, availability of hotlines, etc.)</td>
</tr>
<tr>
<td><strong>Concerning members of a community</strong></td>
<td></td>
</tr>
<tr>
<td>Altruism (“one should assist others”)</td>
<td>reciprocity</td>
</tr>
<tr>
<td>fun of creating something jointly</td>
<td></td>
</tr>
</tbody>
</table>

One might expect users to keep any innovation-related information that they believe is valuable. However, Harhoff and Henkel (2000) argue that it might be more beneficial for an innovator to reveal such information and suggest five theoretical reasons why this might be the case: (1) it may induce improvements by others, (2) an advantageous standard might be achieved this way, (3) low rivalry conditions, (4) expectations of reciprocity, as well as (5) reputation effects.

Franke and Shah have found another motivator which appears to be important with regard to communities: the fun and enjoyment related to engaging in the task and working in a community. “From this perspective, the individual does not view participation and contribution as a cost that needs to be compensated; rather these activities are enjoyable in and of themselves” (Franke & Shah 2002, p. 28). More generally, Amaible (1983) and Cziksentmihalyi (1996), referred to by Franke & Shah, have found that “if activities are rewarding in and of themselves, individuals may perform the activity, as well as exchange information and
assistance related to that activity, even in the absence of financial or other types of rewards” (Franke & Shah, p. 29). Further, Malone and Lepper (1987) argue that intrinsic motivation towards an activity can be enhanced by “mental stimulation and challenge, control, curiosity, and fantasy” (Franke & Shah, p. 29).

On the other hand, a problem combined with promising customers high rewards for new product ideas is that the value of that reward could negatively affect an individual’s intrinsic motivation towards an activity (Franke & Shah 2002). As has been shown by Pittman (1982, 1992) such a shift in motivational orientation from intrinsic to extrinsic deteriorates interpersonal interactions and decreases creativity (Amabile 1985). “Customers might generate suggestions not because of their interest in better new products, but because of their interest in winning a reward” (Brockhoff 2002, p. 8). The incentive might lead those people to hand in ideas who are neither potential customers nor represent the needs and requirements of actual customers (Brockhoff 2002).

### 3.6. Obtaining and Leveraging Customer Knowledge

Having conducted critical literature research we have identified three different approaches to customer knowledge management (CKM): *Kundenwissensmanagement* (Stauss 2002), the *Customer Knowledge Management Concept* (University of St. Gallen) and *Five Styles of Customer Knowledge Management* (Gibbert, Leibold and Probst 2002). These models as well as tools for obtaining and leveraging customer knowledge (the Lead User Model, communities and user toolkits) will be introduced and discussed in section 3.6.1. and 3.6.2. respectively.
3.6.1. Strategies

Before presenting strategies implying direct customer involvement in innovation processes Davenport’s differentiated “in-house” knowledge management approach will be described in short here. Thomas Davenport (1998) argues that “if knowledge is power, customer knowledge is high-octane power”. According to him there is a factor that makes the management of customer knowledge difficult -the fact that there are various types, which must be managed differently. The first type is **data-derived customer knowledge** that is collected through transaction systems. According to Davenport, managing this kind of knowledge requires five S’s: **Strategy** – Determining what information is really important and which aspects of customer behaviour really matter; **Standards** – Agreeing on what is actually meant by “the customer” to ensure that colleagues are talking about the same thing; **Systems** – Providing a suitable computer architecture to gather the dispersed data and to process it; **Statistics** The aggregation of statistical data to knowledge; **Smart people** - Entrusting competent people to arrange and interpret the condensed customer data.

The second type of knowledge is referred to as **human customer knowledge** the reason being that it typically derives from interaction among people. Examples of that kind of knowledge include experimental observations as well as conclusions drawn and lessons learned. Generally, human customer knowledge is gained from a small group of selected customers, however in some cases it might be worthwhile to obtain that knowledge from a large number of consumers. The third type of customer knowledge Davenport refers to is “**tacit, unstructured, difficult-to-express knowledge** that we observe or sense about our customers” (Davenport 1998). He admits that this type of knowledge is difficult to grasp, yet he points out that the “voice of the market never speaks clearly” (Davenport 1998) and that, therefore, employees should be very sensitive to customers’ hidden messages.
3.6.1.1. The Customer Knowledge Management Cycle

In his approach Stauss (2002) links the various forms of customer knowledge (knowledge about the customer, knowledge of the customer and knowledge for the customer) with knowledge management processes. The different steps are depicted in a closed cycle called the Customer Knowledge Management Cycle (Figure 3.6.1.1.). Acquiring knowledge of the customer constitutes the starting point of that cycle. Through processing the knowledge of the customer it becomes knowledge about the customer. In order to leverage that knowledge for innovations and product improvements it must be stored and disseminated within the company. In the next step knowledge deficits of the customer need to be identified. This knowledge for the customer is developed, provided and communicated to the customer in order to dispel the identified deficits. Through this process in turn the customer’s knowledge increases. This is where the cycle closes. To Stauss the different steps and objectives of knowledge management mark the steps of a continuous process.

Another focal point of his work is the description of the various process steps as well as methods that may be applied in these steps. Methods for acquiring knowledge about the customer include sequence-oriented problem identification, analyses of customer behaviour, inquiries and complaints, customer forums and others. Ways of saving, disseminating and leveraging knowledge about the customer comprise document systems, customer databases and intranet solutions. Finally, analyses of customer inquiries and complaints, the transmission of individual information on demand (e.g. hotlines), the passive provision of information on stock (e.g. manuals) and the active sending of information on delivery (e.g. customised letters) constitute methods of developing, providing and communicating knowledge for the customer (Bungard et al. 2003).

In our view especially the first phases dealing with acquiring customer knowledge are interesting for our particular research topic. The means suggested for obtaining knowledge of the customer are not really interactive but, nevertheless, can complement more personal approaches. The remaining phases within the cycle rather aim at enhancing communication between a company and its customers to reduce knowledge deficits of the latter.
3.6.1.2. The University of St. Gallen Concept of CKM

In contrast to Stauss’ approach deriving from knowledge management or knowledge processes respectively, the starting point of the St. Gallen approach originates from reflections about customer relationship management (CRM). A basic thought is to systematically use knowledge accumulated at customer interfaces in order to support business processes. A major concern of Geib and Riempp (2002) is therefore to develop concepts, methods and solutions for knowledge management in customer oriented business processes.

Their model reflects the CRM processes marketing, sales and service, as well as the four central knowledge management aspects content, competence, collaboration and composition (Figure 3.6.1.2.). For answering the question which customer knowledge is needed for which customer-oriented business process a differentiation of operative processes like campaign management or offer management is necessary. The authors attach different systems to the various knowledge aspects. While content and document management systems are crucial for content, where explicit knowledge is handled, tools like yellow pages or e-learning systems are suggested for competence, where tacit knowledge is
managed. **Collaboration** refers to solutions for co-operation between colleagues. These might include instruments to support communication between co-workers and tools for managing operational procedures. **Composition** tools are concerned with the “ergonomic” structure of the contents. According to the authors of the St. Gallen concept, the task of customer knowledge management is to design knowledge flows within the CRM processes as well as between those processes. Another task is to distribute relevant knowledge gained from customer-related processes to other processes such as product development. Summing up, the St. Gallen concept has four characteristics (Bungard et al. 2003, p. 24):

1. integration of customer relationship management and knowledge management concepts;
2. process-oriented view of knowledge management (CRM processes as the place of origin and usage of knowledge);
3. provision of tools and methods from the knowledge management area for supporting CRM processes;
4. approaches pertaining to the area of business engineering for depicting and designing knowledge structures and knowledge flows.

The suggestions and solutions provided by the St. Gallen model are technology-oriented and therefore offer much help when it comes to managing explicit knowledge. However, the model provides only limited assistance when it comes to obtaining and leveraging tacit or implicit customer knowledge. On the other hand ideas concerning the concepts of **collaboration** and **composition** can be of use in a more interactive approach.
3.6.1.3. Five Styles of CKM

The authors Gibbert, Leibold and Probst (2002) discuss the concept of CKM, which refers to the management of knowledge from the customer, i.e. knowledge residing in the customer, in contrast to knowledge about the customer, e.g. customers’ characteristics and preferences prevalent in previous work on knowledge management and customer relationship management. Subsequently, five styles of CKM are proposed and practically illustrated by way of corporate examples. First, the Swiss economists compare customer knowledge management versus knowledge management & customer relationship management (Table 3.6.1.3.1.).
Table 3.6.1.3.1.  CKM versus KM & CRM, (Gibbert et al. 2002, p. 3)

<table>
<thead>
<tr>
<th>Knowledge sought in</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>employee, team, company, network</td>
<td>customer database</td>
<td>customer experience and creativity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Axioms</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘if only we knew what we know’</td>
<td>‘retention is cheaper than acquisition’</td>
<td>‘if we only knew what our customers know’</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objectives</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>sharing knowledge about customers among employees</td>
<td>mining knowledge about the customer</td>
<td>gaining, sharing and expanding knowledge of (inside) the customer, individual/ group experiences in applications</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role of customer</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>passive recipient of product</td>
<td>captive, tied to product-by-loyalty schemes</td>
<td>active knowledge partner</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recipient of incentives</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>employee</td>
<td>customer</td>
<td>customer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corporate role</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>lobbying knowledge-hoarding employees</td>
<td>captive customers</td>
<td>emancipate customer</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business objectives</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>efficiency and speed gains, avoidance of re-inventing the wheel</td>
<td>customer base nurturing, maintaining our customers</td>
<td>collaboration with customers, joint value creation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conceptual base</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>customer retention</td>
<td>customer satisfaction</td>
<td>customer success, innovation, organisational learning</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Business metrics</th>
<th>KM</th>
<th>CRM</th>
<th>CKM</th>
</tr>
</thead>
<tbody>
<tr>
<td>performance against budget; customer retention rate</td>
<td>performance in terms of customer satisfaction and loyalty</td>
<td>performance against competitors in innovation &amp; growth; contribution to customer success</td>
<td></td>
</tr>
</tbody>
</table>
The authors of the Five Styles of Customer Knowledge Management argue that their approach is different from traditional knowledge management in the objective pursued. “Whereas traditional knowledge management is about efficiency gains (avoiding of ‘re-inventing the wheel’) CKM is about innovation and growth. Customer knowledge managers seek opportunities for partnering with their customers as equal co-creators of organisational value” (Gibbert et al. 2002, p. 6). Table 3.6.1.3.2. shows an overview of the five styles, namely prosumerism, team-based co-learning, mutual innovation, communities of creation and joint intellectual property as well as their characteristics.

According to the Swiss economists customer knowledge management enables knowledge-sharing platforms and processes between companies and their customers. “It is a continuous strategic process by which companies enable their customers to move from passive information sources and recipients of products and services to empowered knowledge partners.” (Gibbert et al. 2002, p. 12) The approach “incorporates principles of knowledge management and customer relationship management, but moves decisively beyond it to a higher level of mutual value creation and performance” (Gibbert et al. 2002, p. 12).

In our opinion the described concept by Gibbert, Leibold and Probst constitutes a valuable contribution to the relatively new area of customer knowledge management on account of its practical orientation. Also, amalgamating elements of knowledge management and customer relationship management makes sense since these approaches have a lot in common with thoughts about managing customer knowledge. The concept is in fact the one which comes closest to the idea of leveraging customer input for co-creating more customer-oriented products.
<table>
<thead>
<tr>
<th>Style</th>
<th>Prosumerism</th>
<th>Team-based Co-learning</th>
<th>Mutual Innovation</th>
<th>Communities of Creation</th>
<th>Joint Intellectual Property (IP) / Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>developing tangible assets and benefits</td>
<td>creating corporate social capital</td>
<td>creating new products &amp; processes</td>
<td>mission-specific professional expertise</td>
<td>tangible customer IP</td>
</tr>
<tr>
<td>Objective</td>
<td>improved products and resulting benefits</td>
<td>facilitate team learning for dealing with systematic change</td>
<td>create max. return from new ideas</td>
<td>obtain &amp; explicate professional expertise</td>
<td>max. returns on IP (jointly)</td>
</tr>
<tr>
<td>Processes</td>
<td>pre-, concurrent- &amp; post production integration</td>
<td>teamwork, empowerment, case development, quality programs</td>
<td>idea fairs, brainstorming, customer incubation</td>
<td>best practices communities of practice, expert networks</td>
<td>apprentice-ships, formal training programs, on job training</td>
</tr>
<tr>
<td>Systems</td>
<td>planning, control and decision supply systems</td>
<td>knowledge sharing systems, digital “nervous” systems, customer visits in team</td>
<td>idea generation support systems</td>
<td>expert systems shared e-workspaces, group support systems</td>
<td>group IP, support systems</td>
</tr>
<tr>
<td>Performance Measures</td>
<td>effectiveness &amp; efficiency, customer satisfaction &amp; success</td>
<td>systems productivity, quality, customer satisfaction &amp; success</td>
<td>ROI from new products &amp; processes, customer success</td>
<td>knowledge-sharing behaviour, timeless of decisions, rate of hyperlinked results</td>
<td>value of new IP, incremental ROI on new revenue streams</td>
</tr>
<tr>
<td>Case examples</td>
<td>Quicken, Ikea</td>
<td>Amazon.com</td>
<td>Silicon Graphics, Ryder</td>
<td>Microsoft, Sony</td>
<td>Skandia</td>
</tr>
<tr>
<td>Intensity of interaction</td>
<td>relatively low</td>
<td>low to high</td>
<td>relatively low</td>
<td>relatively high</td>
<td>relatively high</td>
</tr>
<tr>
<td>Type of knowledge</td>
<td>more explicit</td>
<td>explicit and tacit</td>
<td>more tacit</td>
<td>more tacit</td>
<td>more explicit</td>
</tr>
</tbody>
</table>
3.6.2. Methods

Traditional forms of customer involvement include interviews, focus groups\(^6\), complaints and suggestions. These forms of customer involvement usually limit the consumer’s role of product development to being a simple information provider who delivers feedback voluntarily or when requested to do so by market researchers (Jeppesen 2002). Interviews and focus groups may help understand consumer expectations, desires and preferences as well as to determine the consumer’s view on the importance of particular product attributes\(^7\). Complaints may be a valuable source of information when improving existing products. They are often part of total quality management practices. The drawback of complaints is that they are unlikely to lead to radically new products because they are anchored to present product uses and product characteristics (Brockhoff 2002). This is true of suggestions as well. What all of these traditional methods suffer from is the sticky information problem\(^8\): It may be difficult and costly to transfer the customer’s knowledge into the firm (Jeppesen 2002).

In the following sections more active methods of obtaining and leveraging customer knowledge will be introduced. The methods complement each other rather than being alternatives. The Lead User Model (section 3.6.2.1) and user toolkits (section 3.6.2.3) are useful instruments for involving customers in the product development process, whereas user communities (section 3.6.2.2) may rather serve as a platform for exchanging problems or experiences related to a specific product.

Novel communication and information technologies are adding new capabilities for quick and inexpensive customer input to the various stages of the product development process (Rüdiger 2001; Dahan & Hauser 2002). These capabilities enable among other things the evolvement of online communities. Members of these online communities may in turn be lead users with respect to a specific product.

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\(^6\) Focus groups are meetings where market researchers meet (potential) users of a product in order to discuss possible improvements.

\(^7\) With respect to the latter point the conjoint analysis is a popular instrument. In a conjoint analysis products or product concepts are represented by their features, where each feature can have two or more different levels.

\(^8\) see section 3.4.
While new information and communication technology tools may contribute to enhance communication between a manufacturer and its customers or the communication between users respectively, face-to-face dialogues and personal interaction combined with the Lead User Model are particularly useful for transferring tacit knowledge. The various methods of obtaining customer knowledge can be used in different stages of product development (Figure 3.6.2.).

3.6.2.1. The Lead User Model

Von Hippel (1986) developed the lead user model on the notion that typical users’ insights into new product needs and potential solutions are constrained by their own real-world experience. Hence, product users are generally unable of thinking about products and their attributes from a new perspective—an effect called “functional fixedness” (Lüthje et al. 2002, p. 8). Thus, questioning mainstream users of existing products is not very helpful when companies seek input for solutions for emerging problems or needs. Furthermore, he argues that in fast-changing industries such as the high-tech industries, actual experience of average users is often outdated by the time the product is developed or during the time of its estimated life time.
According to von Hippel’s definition, lead users face strong needs that will be
general in the future marketplace– but face them months or years before the
mainstream experiences them –they “lead” with respect to the trend. Lead users
benefit significantly from obtaining a solution to emerging needs. They are
familiar with future conditions earlier than most others and thus may be used for
need-forecasting. In addition, since lead users often strive for satisfying their
needs themselves, they may also offer product concepts and design data (von
Hippel 1986). These assumptions are backed by a number of studies (von Hippel

A study about user innovation in open source software by Franke (2002) shows
that personal experience is a strong trigger for innovation. He points out that this
finding coincides with the view of attitude theory, which argues that attitudes
towards an object will have a greater impact on behaviour in case a subject has
direct contact with the object and is personally involved. He notes that Regan and
Fazio (1977) showed this effect in a classic study on students’ housing shortage: if
a student ever experienced a shortage himself the probability that an attitude like
“we should do something about housing shortages” leads to action considerably
increases.

Users’ problem-solving steps are, according to von Hippel, the following: (1)
Users identify existing multi-product usage patterns in which the new product
must play a role. (2) Users invent or select the new usage patterns which the
proposed new product makes possible for the first time. (3) Users evaluate the
utility of the product in these. (4) Users estimate how the new possibilities
presented by the proposed new product will compete (or fail to compete) with
existing options.

This problem-solving task is difficult, particularly for mainstream users of
existing products and interferes with their ability to think of novel products and
uses when invited to do so.

The methodology by von Hippel suggests the following steps:

“1. Identify an important market or technical trend;
2. Identify lead users who lead that trend in terms of a) experience and
   b) intensity of a need;
3. Analyze lead user need data;
4. Project lead user data onto the general market of interest.”
The most tricky step is to identify a major trend and the respective lead users. This is especially true of consumer markets where economic considerations only play a minor role in the buying process. Due to this irrationality it might be difficult to predict if a trend is relevant for a broader market and whether it is significant from a medium or long-term perspective.

There are three types of lead users: (1) those in the target application and market, (2) those of similar applications in advanced similar markets\(^9\) and (3) those with respect to important attributes of problems faced by users in the target market (von Hippel 1986). Lead user research has proven to be a much quicker concept development process compared to conventional approaches used by many firms. A study shows that conducting a lead user study takes only half of the time compared to other methods (Herstatt and von Hippel 1992). This is, according to the authors of the study, largely due to the fact that technical and marketing departments are working collaboratively leveraging the experience made by lead users while testing prototype solutions. Additionally, involving customers in the innovation process by co-creating and testing prototypes\(^10\) can help overcome the problem that they often do not know in advance which possible solution best fits their needs.

As von Hippel himself admits, there may be some problems companies might face when using the model. It is not sure that the novel need faced by some users is relevant to a broader market and secondly, the concept created by or with the help of lead users may not be appreciated by non-lead users since it may be too novel for them. Thirdly, the concept might not appeal to mainstream users even after a period of “evolving”. Another trouble reported by Olson and Bakke (2001) that appears within the developer’s firm is that managers in that company may have a tendency to abandon the method because they perceive outcomes of user interaction as too indeterminate and overly simplistic.

Despite of these potential shortcomings we find that the lead user model is a very suitable instrument for acquiring knowledge of customers. Due to the intensive

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\(^9\) By “similar market” we mean that an industry serving a different market might have basically the same problem when developing a new solution.

\(^10\) As far as testing prototypes is concerned, focus groups are quite popular.
level of personal interaction this technique is highly capable of transferring customers’ tacit knowledge and, subsequently, co-creating novel solutions.
3.6.2.2. User Communities

Products are often developed by individuals working together. In a community, a member can receive useful advice and assistance from other community members. The literature on “communities of practice” (Lave & Wenger (1991); Brown & Duguid 1991, 2000) provides a good basis for the concept of joint problem-solving described in the remainder of this section. The named authors argue that the ways people actually work usually differ fundamentally from the ways it is formally organised (Franke & Shah 2002). Learning and innovation can often be observed in informal communities of practice aiming at getting work done in a pragmatic and uncomplicated manner (Brown and Duguid 1991). There are all kinds of communities which might contribute to better or entirely new products, services or processes. Case studies about this phenomenon include photocopier repair technicians (Orr 1996), clerical workers (Wenger 1998), and radiology technicians (Barley 1996). Traditionally, communities-of-practice literature is concerned with work-related and corporate communities, whereas we take an interest in communities created by and/or for users.

Probably the most illustrative example of innovative user communities are those found in the open source software field. Open source software is continually being enhanced by volunteers from many different locations and organisations. These individuals develop and share code\(^\text{11}\) to create and improve programs. Apache server software and high performance windsurfing are two cases of innovative networks where linked users were not only inventors of a product but also the distributors (von Hippel (2002))\(^\text{12}\). Further research on communities that have been found to be highly innovative includes studies in the areas of sports (Franke and Shah 2002), flight simulator software (Henkel and Thies 2003) and newspapers (Franz and Wolkinger 2003).

The consumer-electronics manufacturers Sony and Panasonic have opened “antenna shops” at highly frequented locations such as shopping centres and airports, where demanding customers come by and prototype products are

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\(^{11}\) Programs are based on a “code”, which is written in a computer language.

\(^{12}\) According to von Hippel, this occurs if (1) at least some users have sufficient incentives to innovate, (2) at least some of the users have an incentive to voluntarily reveal their innovations and (3) when the diffusion of innovations by users is inexpensive and competitive compared to commercial production and distribution (von Hippel 2002).
presented. These places enable customers to try out the product and communicate with each other, while product managers and development engineers converse with customers or observe them. This way, they get first-hand knowledge of customers’ reactions and what they desire (Gibbert et al. 2002).

In the last couple of years, chat rooms and user communities have facilitated the emergence and communication of product ideas, as well as the exchange of knowledge about and the experiences with products. The internet forums dooyoo.com and ciao.com may serve as examples. Amazon.com uses customer knowledge for own purposes and provides the collected information and data about the customers’ preferences and buying patterns as a service to other customers. Additionally, reviews submitted by a reader or listener might help others when deciding whether or not to buy a particular product.

The essence of the above examples of user communities is that individuals or users share common ideas, passions or interests, as well as they exchange insights and experiences. They are often well-informed, knowledgeable and creatively engaged in a particular field. Hence, many of them meet the criteria of lead users (see section 3.6.2.1.). Members provide each other with information and assistance and may build on each others’ ideas. Taken together, user communities can be seen as a valuable source of input for product innovation.

3.6.2.3. Toolkits

In the traditional product development process, manufacturers first explore user needs and then develop responsive products. Developing an accurate understanding of a user need is difficult and takes time and financial resources. Up to 80 percent of a product’s cost and a substantial portion of its value proposition are determined during the design and development process. Moreover, a survey by McKinsey found that “team-based development” requires full and “time-sensitive” information streams embracing not only internal entities of the organisation but also external such as suppliers and customers. (Coulter et al. 2002).

13 Sawhney and Prandelli (2000) refer to these communities as communities of creation.
Another difficulty often connected with entirely understanding customers’ needs is the vagueness of the process. “Even when customers think that they know precisely what they want, they often cannot transfer that information to manufacturers clearly or completely” (Thomke and von Hippel 2002, p. 5). Taken together, this causes costly and time-consuming iterations between suppliers and customers to reach a satisfactory solution.

Luckily, progresses in the areas of computer aided design (CAD) and computer aided manufacturing (CAM) have allowed the emergence of a wholly new approach to product development. Instead of attempting to unambiguously understand customers’ needs manufacturers now let customers bring in the relevant information on the features of “their” products. They do this by equipping them with appropriate tools: “toolkits for user innovation” (Katz & von Hippel 2002).

Toolkits for user innovation are integrated sets of user-friendly design tools enabling users to develop product innovations themselves. They combine features of mass customisation and unrestricted user innovation (Figure 3.6.2.3.1.). Toolkits allow customers to create prototypes on their own by allowing them to test different parameters and features of a product more detailed and freely as compared to mass-customisation configurators forcing customers to pick from a limited number of options. Henkel and Thies (2003) argue that there is a strong case for manufacturers to employ toolkits: (1) Specific needs can be met less costly or to a higher degree; (2), The “toolkit” itself could be an appealing feature of its own; (3) The user innovations may serve as a creative input for future products attracting a broader market.

Figure 3.6.2.3.1. Innovation Toolkits vs. Mass Customization and Free User Innovation (Henkel & Thies 2003, p. 2)
There is no ready-made solution as the question what a suitable toolkit might look like. In fact, “they are specific to the design challenges of a specific field or sub field” (Katz & von Hippel 2002, p. 2). They enable users to freely innovate, enabling them to “develop producible custom products via iterative trial and error” (Katz & von Hippel 2002, p. 2). They enable users to render a temporary design, simulate and prototype it, appraise the performance of the new prototype in their own field, and then gradually improve it until reaching desired outcome (Katz & von Hippel 2002) (Figure 3.6.2.3.2.).

Figure 3.6.2.3.2. Customers-as-Innovators vs. Traditional Approach, (Thomke & von Hippel 2002, p. 6)

Thomke and von Hippel concede that “developing the right tool kit for a customer is hardly a simple matter” (Thomke & von Hippel 2002, p. 7). According to them, toolkits must offer four important features. First, and most importantly, they must allow users to accomplish a number of design cycles driven by learning by doing. Simulations run on computers enable customers to test new ideas and create new versions without physically producing the prototypes. The authors argue that in the absence of simulation technology delivering the desired accuracy, rapid prototyping methods can be added. Second, toolkits must be easily manageable for users. Familiarising customers with them should not involve learning a new design language.

The two writers give the example of a flavourist who thinks “in terms of formulations and chemical compounds, whereas customers think of tastes such as smoky, sweet, fresh, and so on” (Thomke & von Hippel 2002, p. 7). Third,
toolkits have to include large amounts of “useful components and modules” which have been tested and “debugged”. Equipping users with these basics enables them to concentrate their work on designing genuinely new features for their prototypes. Fourth, designers of toolkits have to take the peculiarities of the production process into consideration, thereby ensuring the feasibility of manufacturing. Katz and von Hippel added another feature as a fifth element: a toolkit has to offer an “appropriate solution space” (Katz & von Hippel 2002, p. 10) that encompasses the design they want to create.

Jeppesen (2002) determines four important dimensions of the toolkit approach, which a toolkit provider should consider: (1) the size of the design space left to customers, (2) the level of consumers’ design capabilities, (3) the wished outcome of toolkit use and (4) the intensity of support provided.

Design space – It determines to what extent users can influence the various features and characteristics of a “self-made” product. Generally, the more freely a toolkit operator can create, the more complex the handling of that toolkit will be: for one thing, this is due to the number of variables to consider; resulting from that, the number of alternatives will increase and thereby complicate decision making.

Customer design capabilities – “The existing design capability is the embedded level of excellence that decides what customers are able to do with a certain toolkit” (Jeppesen 2002, p. 14). The bigger the design capabilities the better are the chances for the consumer of finding a solution exactly matching his/her needs.

Wished design outcomes – The more demanding the desired result of the innovation process is the more tricky will it be to conceive an appropriate toolkit.

Support – According to Jeppesen user support may moderate imbalances in the former dimension. In his view, successfully employing toolkits involves a individual balancing of the key dimensions and requires consideration of what kind of tasks should be transferred to consumers and how this can be achieved. Of more general consideration is the question as to the benefits of customer contributions.
The toolkit for innovation approach complements the lead user approach very well: in general, consumers willing to utilise a toolkit in order to satisfy their needs are “lead users” by anticipating future standard needs. They can supply manufacturers with valuable input which may be useful for conceptualising new products (von Hippel & Katz.2002).

Katz and von Hippel contend that being first on the market with toolkits solutions can create competitive advantages for manufacturers. They argue that “first-movers” might have the chance of establishing a standard design language that is generally accepted in the respective market. Another conceivable advantage for manufacturers may be “to allow easy, error-free translations of designs made by users into their own production capabilities” (Katz & von Hippel 2002, p. 20). The American authors concede, however, that specialised firms might develop tools compatible with production facilities of a number of manufacturers. This non-manufacturer standard may “degrade” the latter role to one of merely finalising innovation processes with their special production skills.

3.7. Implications of the Theoretical Foundation

Having started with philosophical thoughts about the nature of knowledge (section 3.1.) we have introduced the reader to the roots of knowledge and how the different epistemological traditions in the western society evolved. Proceeding with Nonaka’s and Takeuchi’s “The knowledge creating company” (section 3.2.) our aim was to demonstrate that external knowledge can be leveraged to develop new products which better match customers’ needs. It is important to understand that acquiring and leveraging customers’ personal knowledge is an interactive, highly-involving process.

Further, we discussed the importance for multinational companies to establish corresponding strategies and that it is essential to create a “dynamic capability” –a function of the firm’s ability to innovate, learn, and continuously reposition itself more effectively than its competitors (section 3.3.). In the next step the importance of innovation-relevant customer knowledge for novel products (section 3.4.) and the motives for customers to contribute to product development (section 3.5.) have been explained and discussed.
Stauss’ *Customer Knowledge Management Cycle* (section 3.6.1.1.) has been portrayed in the paper because it links the different forms of customer knowledge (knowledge about, of and for the customer) with knowledge management processes. The approach explains the various steps and objectives of knowledge management and describes the steps as phases of a continuous process. Some of the means of obtaining customer knowledge presented in Strauss’ work will be one of the focal points of the empirical research.

The *University of St. Gallen Concept of Customer Knowledge Management* (section 3.6.1.2.) is a process-oriented approach to systematically use knowledge accumulated at customer interfaces in order to support business processes. The major idea of the concept is to show methods and solutions for knowledge management in customer-oriented business processes. The St. Gallen model reflects the customer relationship management processes marketing, sales and service, as well as the four central knowledge management aspects *content, competence, collaboration and composition*. Some of the ideas of the concept have been implemented in the empirical research and two of the questions aim at learning about collaboration and composition.

The third strategy, namely *Five Styles of Customer Knowledge Management* (section 3.6.1.3.), inspired us to examine in how far the ideas of the authors, namely that customer knowledge management creates new knowledge-sharing platforms and processes between companies and their customers, are disseminated among selected industries and regions.

After having worked out the foundations of knowledge, how it can be managed within companies, the important role of customer knowledge in innovation processes, as well customers’ benefits of contributing to innovations and having explained the role of corresponding strategies we have introduced the reader to methods suggested by academic literature to gain and utilise customer knowledge.

The *Lead User Model* (section 3.6.2.1.) enables customers to co-develop product ideas and concepts, while user communities (section 3.6.2.2.) help leverage the benefits of a creative network of like-minded individuals sharing interest in the same product. *Toolkits* (section 3.6.2.3.) may contribute to reduce re-design cycles by providing customers with tools to develop their own solutions.

It can be assumed that, if companies have realised the significance of the matter, they have developed or are going to develop strategies and methods to obtain and
leverage customer knowledge. To put it in a nutshell, the level of diffusion of the aforementioned strategies and methods can indicate a manifestation of a shift in companies’ mindset by turning customers from mere recipients of products and sources of information to “knowledge partners” communicating at eye level.
4. Empirical Method

This section begins with an introduction of the choice of empirical method, then proceeds with the research strategy, the time horizon and the data collection method. Finally, the sample selection, the design of the questionnaire, the operationalisation, as well as the data analysis are being discussed.

4.1. Choice of Empirical Method

Baring in mind the various research strategies and the purpose of our research, the empirical method has been chosen. The method is deductive containing some inductive elements as well. It is based on the positivist research philosophy influenced partially by interpretivism.

The starting point of the survey is the fact that researchers have found innovative users in a range of industries and that innovative companies employ various methods to gain customer knowledge. So learning about the diffusion level of those methods in selected lines of business and regions, as well as the role of the customer in innovation processes constitutes the inductive component of the paper. In our view this goal can best be achieved by interviewing a large number of companies using the same set of questions.

4.2. Research Strategy

The basic research strategy used in this dissertation is a survey. Using a survey strategy should give us more control over the research process (Saunders et al. 2003). However, much time has to be spent on designing and piloting the questionnaire. The survey also allows the collection of a large amount of data from a sizeable population in a highly economical way. A questionnaire as an instrument to collect data offers the advantage that by asking a large sample of interviewees the same questions the responses are comparable. Therefore, attempts can be made to generalise the findings. Finally the survey strategy is perceived as authoritative by people in general. However, the data collected by the survey strategy may not be as wide-ranging as those collected by other research
strategies. There is a limit to the number of questions that a questionnaire can contain since respondents might find it exhausting to answer a huge number of questions –especially, when they do not get anything in return or if they are not interested in the research topic. Also, as Saunders et al. (2003) put it, there is always a capacity to do it badly.

Balancing the disadvantages and advantages of the survey research strategy we decided to use a pilot-survey research strategy as the most suitable way considering the time available and the aim of the dissertation. Piloting the questionnaire reduces the risk of misunderstandings since it offers the opportunity to enhance the design and the wording if necessary.

4.3. Time Horizon

The paper’s aim is to give a state-of-the-art view as to the question of the customer’s role regarding product innovations in different industries and regions. We want to learn about the extent of diffusion of certain techniques of customer involvement in innovation processes in today’s business and do not intend to make any inferences for future time horizons. Therefore, a cross-sectional perspective was chosen.

4.4. Type of Study

The research contains three types of study: exploratory, descriptive and explanatory. The research objective (section 1.4.) is chiefly of an exploratory kind. Since the research questions can best be answered by interviewing a larger number of companies, we chose to use a questionnaire as an appropriate means of collecting primary data from a rather big sample size. The companies were asked to respond to a standardised e-mail questionnaire. When compared to traditional mail surveys, the advantages of an online survey are, among other things, higher speed and lower costs (Lescher 1995; Dahan & Hauser 2002). We are aware of the main downside combined with administering questionnaires by e-mail: they
tend to yield a lower response rate than other types of interviews. In light of this fact the sample size has been set relatively high at about 105.

Unfortunately, the response rate was too low as to serve the purpose of the study. Therefore, telephone interviews with 15 companies residing in Europe have been conducted. To live up to the exploratory character of the study, we have chosen to conduct semi-structured interviews. This type of interview is characterised by more flexibility and interaction as compared to questionnaires, allowing the interviewer and the respondent to achieve a better understanding of each others’ thoughts and to discuss the answers.

A descriptive study is implemented in the literature review, studying books and articles regarding the topic of gaining customer knowledge and involving the customer as a user to suggest a better solution. The study is partly explanatory as well, combining the academic research with the practice, trying to find a link between theory and the real world.

The first part of the paper has a descriptive character, whereas the research part is exploratory since the aim of the research is to determine in how far the concepts and ideas contained in academic literature are implemented by companies. In the final section of the paper an attempt is made to explain the findings of the research. Hence, an explanatory element can be found as well.

### 4.5. Data Collection Method

Reading the literature about research methods, basically three types of data can be identified: primary, secondary and tertiary. All of these types are employed in the dissertation. Primary data has been gathered in the form of responses by e-mail as well as on the telephone in order to identify general patterns such as whether the companies in selected industries and regions use certain instruments for customer involvement. Secondary data (books, articles, internet), including qualitative data, was used in order to get a general understanding of the topic and to learn about research already done in the area. The study includes tertiary data from dictionaries and abstracts.

Since our research is to some extent exploratory, and due to the short period of time available, we regard a self-administered questionnaire as the best way of
collecting the necessary data. Case studies and observation studies like complete participant and complete observer are interesting, but cannot be used since the sample of the investigated companies is relatively big and they are situated all over the world. Ethnography and document analyses were excluded because they do not match our purpose and we do not have access to companies’ documents.

4.6. Sample Selection

According to literature two aspects should be considered when selecting a sample: to achieve maximum precision in the estimates within a given sample size and to avoid bias in the selection of the sample (Kumar 1996). For our research purpose a non-random/probability sampling design has been chosen. This design does not follow the theory of probability in the choice of elements from the sampling population. It is used when the number of elements in a population is either unknown or cannot be individually identified. One of the methods within the non-random/probability design is judgemental or purposive sampling, which in our opinion is the best one for achieving our goals. According to literature on research this type of sampling is extremely useful when it comes to fields of research which are rather new (Kumar 1996).

Firstly, companies serving industrial customers were chosen assuming that they are highly interested in giving their clients a product exactly matching their mostly sophisticated demands since products on industrial markets are often rather complex, sometimes even unique. Therefore, one of the research objects are companies operating in the business-to-business market. More specifically, companies dealing with flavours and fragrances and those active in the automotive industry have been analysed. Secondly, also customers within consumer goods markets may have highly specific demands. This is true for products which highly involve the consumers personally and emotionally, like cars, sports equipment, entertainment electronics or food. This is why our research is directed to companies producing these high-involvement /high-interest products as well.
Furthermore, our research is limited to mid-sized and large companies, since due to their financial resources it can be assumed that these companies can choose from a larger set of methods and instruments for obtaining and leveraging customer knowledge as compared to small companies. In general, mid-sized companies were preferred to large concerns since it can be assumed that in less complex medium-sized operations with fewer products or product categories the person(s) capable of answering questions concerning product development should be easier to find.

We chose to focus our research on companies situated in economically highly developed regions including Western Europe, the United States and Japan. The selected companies within Western Europe are established in Germany, France, Italy, Great Britain as well as in Sweden, the Netherlands, Belgium and Switzerland. Some of the companies were known to the authors before, others were found through searching the internet.

With respect to the business-to-consumer area we chose companies within the consumer electronics industry as well as the sports equipment and the car industry. Companies operating in the business of car parts as well as flavours and fragrances were selected as representatives of the business-to-business market.

Table 4.6.1. shows the structure of the sample used for the e-mail questionnaire. The 24 European companies selected for the telephone interviews operate in the same industries as those interviewed by e-mail.

<table>
<thead>
<tr>
<th>Line of Business /Geographic Origin</th>
<th>USA</th>
<th>Japan</th>
<th>Western Europe</th>
</tr>
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<tbody>
<tr>
<td><strong>Business-to-Business</strong></td>
<td></td>
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<tr>
<td>Automotive</td>
<td>7</td>
<td>7</td>
<td>7</td>
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<tr>
<td>Flavours &amp; Fragrances</td>
<td>6</td>
<td>6</td>
<td>7</td>
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<tr>
<td><strong>Business-to-Consumer</strong></td>
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<td>Cars</td>
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<td>4</td>
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<tr>
<td>Consumer Electronics</td>
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<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Food</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Sports Equipment</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

|                         | 33  | 34  | 38  |

Table 4.6.1. Sample Composition
4.7. The Questionnaire

Since our research strategy is a survey with the aim of gaining information from a large number of firms, we decided to use a questionnaire. More precisely, the questionnaire was self-administered and distributed via e-mail. The choice of questionnaire was influenced by various factors comprising the sample size, as well as time and cost considerations.

Using a questionnaire always implies the risk that it does not reach the “right” person or that it is completed by “anyone” without much care just to please the interviewer. In order to manage the first issue, the background and the purpose of the study have been briefly described in the introductory e-mail as well as in the questionnaire itself. The latter problem cannot be completely eliminated but we tried to mitigate it by rendering the design of the questionnaire appealing and by keeping it as short as possible (with only seven questions). The shortness and the use of only one open question might also help to reduce the abruption rate. The questionnaire has been pilot-tested on nine companies to test if companies find it indeed appealing and if the questions were understood correctly.

In our opinion the e-mail address itself (eh03297@hkrfs.se) might have contributed to the response of only one company when pilot testing the questionnaire. To reduce the risk that companies possibly filtered the e-mail address in the first place or deleted it later on account of the “appearance” of the address we changed it after the pilot-testing.

4.7.1. Response Rate

From the 105 questionnaires distributed to three different regions and to six different industries, 11 questionnaires were returned, three of which after having sent a reminder to those companies. This corresponds with a response rate of about 10.5 percent. Due to the quite low response rate the telephone interviews with 24 companies have been conducted, 15 of which were willing to answer the questions. Two of these companies have already been interviewed via e-mail questionnaires. One of them had offered us to conduct a telephone interview, whereas the other one responded in a way, which we thought to be interesting to discuss in more depth. The remaining companies were not part of the first sample.
4.7.2. Operationalisation

An additional important characteristic of the research method is that the results need to be measured and standardised in order to gain a better understanding of the answered questions. In this line we created a questionnaire based on four types of closed questions. First, there are list questions and category questions in order to obtain comparable answers from the respondents. The second type of questions such as grid and quantity questions was chosen to receive much information with little effort and to make it more convenient for the respondents to answer. Grid questions are particularly useful when a large number of possible answers is probable. To assure a better response rate and to make it more enjoyable to respond the questions were formulated as simple and short as possible. In order to be understood properly, technical terms were avoided or explained briefly respectively.

As a little incentive to complete the questionnaire we offered the enterprises to send them a brief summary of the results if desired. Further, we asked the companies to complete the questionnaire within a fixed period of time (two weeks). Companies which did not respond within eight days after the distribution of the questionnaires were sent a follow-up e-mail containing a reminder.

With regard to the two respondents who have completed the e-mail questionnaire already, we discussed the received answers in more detail and asked for explanations. The remaining telephone interviewees were asked the same set of questions as those who received the e-mail questionnaire. Although the order and the exact wording of the questions varied in the telephone interviews, the responses were by and large comparable to those obtained through the e-mail questionnaires. In some cases, some additional information could be gained through follow-up questions.

4.8. Data Analysis

Due to the fact that the response rate of the questionnaire was very low the statistical evaluation was no priority. The efforts were concentrated on the analysis of every response trying to figure out differences and similarities between the industries and regions. Statistical instruments such as central tendency and
standard deviation were not used since they would not yield meaningful results due to the low response rate and the types of questions asked.

The analysis starts with the first question of the questionnaire adding the knowledge obtained through the telephone interviews. In short, the analysis was rather qualitative than quantitative.

4.9. Reliability

“The goal of measurement in research is to turn the complexity of the environment in which the study is being conducted into a set of data that represent only those features in which the researcher is interested” (Martella et al. 1999). Many researchers view the reliability as the consistency of the results over time. In other words they believe that reliability indicates whether the participants would essentially respond the same way at different times. By implying continuity they ignore the dynamism of environmental influences.

The purpose of the conducted study and the research subject do not coincide with this view. We are only interested in the current situation and refrain from making statements regarding the future since responses may be considerably different in a few years. It is also questionable whether the answers would be the same if the questionnaire were answered by a different person of the company, who might have another understanding of the matter. In our opinion the latter depends on the administration of the questionnaire and its design. In order to achieve a greater reliability the questions were formulated as precise and simple as possible and special terms were explained or elaborated to avoid misunderstandings. Although we did our best it is still possible that the reliability of the study might be harmed by some respondents who may not answer the questions truthfully, whatever the reasons for it can be (e.g. company policies).
4.10. Validity

Validity answers the question whether the measurement device is appropriate for what is intended to be measured (Saunders et al., 2003). Additionally, it is important to note that validity not only deals with the measurement device’s representation of the construct under study, but also the circumstances of its administration. The validity of the measurement device is affected by the manner in which it is administered. If the measurement device is administered inappropriately, the interpretation of the results and hence the validity will be adversely affected. Since we decided to render judgemental or purposive sampling in order to get a representative view of the extent to which tools and methods suggested by literature are utilised by companies within various industries and regions, we think that the validity of the study is assured and certain inferences can be made. As stated in section 4.9., the questionnaire was designed in a simple way and corresponds with the research purpose -to investigate whether the companies use or not use the new methods and instruments. Although the sample size and the low response rate do not allow generalised statements, the results may well serve as a good starting point for in-depth research.

Due to the fact that for the majority of the interviewees English is not the mother tongue it cannot be assured that all respondents understand properly what is asked or understand it in the same way. Besides, even if the respondents interpret the questions correctly, there is still the possibility that they are not answered by the person who is most competent to do so. More generally, it cannot be guaranteed that even a competent respondent will answer the questions truthfully. The latter can be considered a minor problem in this case since the questionnaire does not ask for any confidential or sensitive data.

In order not to adversely affect the validity it has been chosen not to integrate the results received from the two aforementioned companies by e-mail when analysing the responses yielded by the respective telephone interviews.
5. Analysis

In order to achieve the purpose of the paper, namely to learn more about if or how knowledge of the customer is gained by companies, which techniques (see section 3.6.2.) are dominant among the selected industries (the automotive industry as well as the flavours & fragrances sector within the business-to-business area and companies serving consumer goods markets including sports equipment, consumer electronics, cars as well as food) and regions (USA, Western Europe as well as Japan), and whether strategies (see section 3.6.1.) can be identified as to how companies obtain customer knowledge, the responses (11) to every question of the questionnaire will be analysed in this section. Also, the results gained through the telephone interviews (13) will be scrutinised according to the aforementioned criteria.

5.1. Evaluation of the Companies’ Efforts to Involve the Customer

The first question of the questionnaire (see Appendix) was set in way to give a view of the companies’ willingness to implement the customer in the innovation process. The aim of the question was to measure whether there is any personnel in the company that is mainly concerned with obtaining and leveraging knowledge of the customer. The ulterior motive was to learn about the companies’ understanding of the customer’s role in innovation processes within the companies. Are companies ready to give up the traditional view that customers are merely recipients of a given product in order to look at them as potentially valuable sources of knowledge or even as partners. Have companies established or do pursue any strategies to achieve the clients’ knowledge.

The obtained responses were quite controversial. A lot of the companies gave the answer that there is staff that is concerned with the matter but they did not quantify them nor did most of them state since when they have established such a department. Some companies interviewed on the phone answered that there was no specific department for that task and that it was almost impossible to identify the responsibilities of everyone because group work prevailed here. Generally, there was a tendency to give a rather foggy answer to the first question. We
presume that with respect to the first question of the questionnaire some companies understood it differently from what was intended: some firms might rather have thought of “knowledge of the customer” as the customers’ wishes and preferences and hence might have thought of it as a matter of market research. Another reason for the ambiguity of the responses might be that some companies did not want to lay themselves open to criticism. They might rather have wanted to convey the image of a clearly customer oriented company. This presumption is supported by the fact that some respondents interviewed on the phone admitted that obtaining “customers’ knowledge” is a job of the marketing department rather than one of the R & D section.

Thinking about the received answers we cannot sense a shift from the traditional mindset mentioned earlier. Further, there were differences among the industries concerning the efforts to involve the customer. During the telephone interviews almost all of the companies within the food industry stated that they recognised the strategic aspect of the issue but had not taken any measures nor have they invested in staff due to a great variety of products and the difficulties combined with obtaining the unique knowledge of the customer. This again shows the different understanding of the question between those enterprises completing the questionnaire and those responding on the phone.

On the other hand almost all of the companies operating in the sports equipment industry answered that they are really concerned with the matter and do their best to involve the customer in product development because they believe that it is very important to foresee the coming trend. They clearly recognise the benefits of involving customers in the innovation process. Also, companies dealing with flavours and fragrances obviously acknowledge the importance of customer integration. Responses from the other industries were rather equivocal and therefore do not allow us to draw any conclusions. We can only guess that in these industries efforts to gain customer knowledge are not prevalent. No major differences with respect to the geographic origin of the companies could be determined.
5.2. The Origin of Innovations

When companies create new products they can do this either completely by themselves, tap external sources like suppliers, competitors, customers, universities and research institutions or, alternatively, they can work jointly with external organisations or institutions. The aim of the second question was to get a better understanding of where innovations actually originate from and whether there are any striking differences with regard to the geographic origin and the respective industries. Furthermore, with the second question the global aim to identify any strategy and whether companies have recognised the potential of customer’s knowledge as a source of innovation was pursued.

Put in another way, the aim of the question was to learn about the role of various “actors” – among other things the customer – in companies’ innovation strategies.

Most of the respondents stated that the major part of the innovations derived from inside of the companies but it was also stated that sometimes outside sources played a crucial role for new inspirations. Three of the respondents who answered the online questionnaire clearly pointed out that their innovations exclusively originated from inside the company. This was also the answer of three telephone interviewees saying that brainstorming was often used among employees of their R & D department and their marketing experts and that they relied chiefly on internal sources. However, no tendency as to the business sector or region as to this response could be identified.

Some of the telephone interviewees stated that they were working on building connections with universities and research institutions and that they were willing to broaden this cooperation. They also assured that this was going to be a priority in their work as to future product development. This statement was made predominantly by firms serving the car supplier market and the car market. All of the respondents from the United States stated that they often work and cooperate with universities and research institutions. From the received questionnaires it could be derived that Japanese companies tend to work with companies from the same industry as well as competitors and that quite often innovations can be attributed to joint efforts of individuals from inside and outside the company. Respondents of the online questionnaire (6 out of 11) and the telephone interviews
(9 out of 13) stated that their innovations at least “sometimes” originated from sources outside the boundaries of their company.

5.3. The Degree of Customer Involvement in the Innovation Process

The involvement of the customer in product development is, according to literature, a critical success factor for companies competing in today’s customer-dominated marketplaces. Therefore, we set our aim to understand to what degree companies involve users in the innovation process and whether significant differences can be found with regard to the respective industry and region the companies operate in.

Many of the phone respondents and especially those representing the business-to-consumer area pointed out that the dialogue with customers was of utmost importance and that customer complaints may serve as a starting point for innovations. The same interviewees explained that complaints received through letters, e-mails and phone calls were analysed by the marketing or R&D department. According to them some of the critique uttered by product users has been the driver for thinking of and creating better products. The majority of the telephone interviewees (10 out of 13) also stated that they carefully analysed the suggestions received by the latter.

Analysing the e-mail questionnaire it can be stated that seven out of eleven companies involved customers in the first steps of the product development process by considering complaints; six of the companies took suggestions into account (see Table 3.5.1.). Four respondents pointed out that they gave customers the freedom to create product concepts. Two automotive companies reported to let customers develop drafts. Evaluating prototypes of novel products appeared to be highly popular among the companies and especially among the consumer goods industries. It can further be stated that in the B2B market some companies have pointed out to let their clients evaluate the new prototypes. On the other hand it was quite controversial that one of the telephone respondents within the food industry who had stated in the e-mail questionnaire that customer suggestions are being taken into account when developing new products told us on the telephone that suggestions do not have any bearing as regards product development. “When
developing new products we do not let customers do this job, because new products suggested by them could only be a niche product and the costs are too big to take the risk”; and further: “It has never occurred that a customer suggestion has lead to a new product”. Yet it might well be the case that suggestions contribute to improvements of existing products. Another representative from the business-to-consumer sector, namely a sports equipment producer (producing among other things snowboards and inline skates), pointed out that they worked jointly with customers and let their customers come up with concepts for new products. Further, they told us that lead users were involved in this process.

Two of the business-to-business representatives from the automotive industry, clearly stated that customer input not only served as a starting point, but they also tried to involve them in the whole process of innovation from the idea to the final product. According to their responses they give (potential) consumers the opportunity to create their own drafts and prototypes of the desired product.

None of the respondents reported not to make use of any customer input whatsoever.

Table 5.3.1. Customer Involvement among Regions and Industries

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<tr>
<th></th>
<th>no involvement</th>
<th>complaints</th>
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<th>product concepts</th>
<th>drafts</th>
<th>prototype testing</th>
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B2B

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<th>prototype testing</th>
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<td>1</td>
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B2C

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<th>product concepts</th>
<th>drafts</th>
<th>prototype testing</th>
</tr>
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<td>0</td>
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<td>2</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Sports Equipment</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

|                      | 0              | 7          | 6           | 4                | 2      | 8                 |
5.4. The Extent of Diffusion of the Lead User Model

In our opinion the integration of intensive users of a product into the development process of a product, referred to by von Hippel as the lead user model, might play a central role when it comes to leveraging customer knowledge for the creation of new or better products. Lead users are acquainted with a product’s details and have a great interest in improving it or even creating an entirely new solution to a specific problem. Involving them in the product development process should make sense in virtually any industry.

Almost half of the respondents of the online inquiry stated that they were using the lead user model. Two of them reported to be using it for four years, one for five years while the remaining respondents answering in the affirmative did not know for how long they have been using it. One of the respondents belonging to the food industry pointed out that the model was not used to the extent that the theory suggests but that they did have an external consumer panel, which is “closely integrated”. Many of the telephone interviewees also stated that the model was used to some extent in the companies, but none of them gave us more detailed information regarding this point.

We ascertained that almost two thirds (8 out of 13) of the telephone respondents (all of which are operating within the business-to-consumer market) have their “working group” consisting of consumers and employees of the company, but the understanding of lead users was different. Since the companies were using this selected group rather to test new products than to receive ideas or inspiration for entirely new products, we presumed that this technique can only be to a small degree characterised as lead user model. For example, a German consumer electronics manufacturer told us that (potential) consumers were involved in product development. But, as it turned out, consumers were not involved in the “creative part” but were merely asked about their preferences and opinions concerning in-house developed prototypes.

Analysing the received answers it turned out that two out of three automotive companies were using the model. Respondents from car and sports equipment producers (four respondents) were the only representatives of the business-to-consumer market to state that the model was used in the product development process.
Consumer electronics producers and food manufacturers as well as the companies within flavours and fragrances sector did, according to the responses, not attach any significance to this instrument, or as one of the respondents put it: “In our industry the Lead User Model does not make much sense simply because customers do not meet the necessary criteria. It is hard to identify such thing as a trend and to find people who would lead that trend.”

Concerning the geographical diffusion of the model it can be stated that in the United States (three out of three respondents) and Japan (two out of three respondents) the model is used more often than in Europe (see section 5.8.2). Some companies in Europe were familiar with the model, but they either not used it or understood it in a different way, which in our opinion does not match the definition and the purpose of the model.

5.5. The Extent of Diffusion of User Communities

The term user community was deliberately defined quite broadly in the questionnaire in order to leave respondents space for own interpretations (“a communication platform with the aim of sharing knowledge and experiences and solving problems with other users of a product.”) the reason being that the social construct of a “community” can take many forms, e.g. chat rooms, gatherings, or clubs.

Inevitably, this had lead to a broad variety of answers and, possibly, some confusion among the respondents as to what exactly would fall into the category of a “community”. Two of the telephone respondents have answered that their homepage served as a community platform which turned out to be not quite right after having checked these internet sites. They understood ‘community’ as a platform where consumers can utter their opinions and complaints related to a product of the company without having other users as a counterpart. This was not the kind of communication platform we were thinking of since in a community there is a “two-way” communication between their members. One out of three respondents who said they involved user communities in the innovation process did not add for how long they have been using such a platform and whether the
platform was operated by the company or run independently by users. The others reported that a community for their products existed for between two to five years. Communities were used mainly by the car manufacturers and sports equipment producers (see Table 5.8.1.) where some of the platforms were operated and organised by the companies while some were voluntary communities. Some of these communities were partly financially supported by the company leaving more freedom to its users and acting rather in the background. The existence of such communication platforms in the aforementioned industries makes sense, since automobiles and sports enjoy huge popularity and involve personal interest. It is a well-known fact that people tend to share what they like.

Consumer electronics producers also argued that they used communities to some extent but the answers were controversial. Reflecting about a phone interview conducted with a French enterprise, we got the impression that communities within the consumer electronics sector are quite rare and rather occur in niche markets. What seems to be more relevant to users of these products is the “software” available for the respective products. The homepage of Nintendo may serve as an example here. On Nintendo’s website, users chat about games and exchange their experiences. Another case in point are LAN-parties were computer fans gather to play computer games all night long. To conclude, not the hardware itself seems to be of particular interest for the majority of users but complementary products designed for them.

Discussing the answers received from food producers, they are more or less the same as those from the consumer electronics industry. Obviously, communities do not play an important role here with respect to product development. Food is a product of great interest for many people and exchanging recipes and trying new ones is a widespread phenomenon. Principally, everybody can think of new “products” in this field and has actually been inventive here. Nevertheless, involving innovative consumers in the process of developing new products or variations is largely unheard of. Two of the telephone interviewees said that they were aware of the existence of communities related to their products but that it was not a company policy to attach any strategic significance to them.

Concerning the extent of diffusion among regions it turned out that communities were employed more often in the United States than in Japan and in Europe (see Table 5.8.2.). Two out of three American companies stated that they operated
platforms on their own since four and a half and five years respectively. Representatives of European companies as well as from Japanese enterprises did not know about the date of existence of their communities, but some of them stated that their companies were using clients’ communities.

5.6. The Extent of Diffusion of Toolkits

Toolkits as a new method to gain knowledge of the customer sound promising. The technique is the newest of the three and exists for just a few years. Therefore, the aim was to measure whether companies know it or use it.

The majority of the companies (six out of 11 respondents of the e-mail questionnaire and 10 out of 13 telephone interviewees) were not employing it as could be ascertained to a great extent from the telephone interviews as well as from the online questionnaire. However, there were some companies (three telephone respondents) stating that the technique was familiar to them.

Analysing the answers, the conclusion was drawn that the experience with the technique was rather low: all except for one company which used it pointed out that they have been using toolkits for two years at the most. One American company stated that it was using the method for three years. Industries reporting to be employing the new instrument cover the automotive sector as well as the flavours and fragrances and the car business. Although all of the responding car manufacturers stated to be employing toolkits as can be seen in Figure 5.6.1, it cannot be said for sure that all car makers are utilising the method since the sample size within this industry (see Table 4.6.1) has been rather small. Besides, taking into account the responses obtained in the telephone interviews it can be assumed that the method is used rather to let the buyer customise a limited amount of features of the car (e.g. colour, hub caps, special features) than giving customers the freedom to completely or to a large extent alter the design of the car. However, this concept of toolkits does not match the criteria set by academic literature (see section 3.6.2.3.).

Three out of four respondents (email and telephone survey) from the flavours and fragrances industry stated that the method was known to them and they used it in order to render new products. As they pointed out their customers were getting
more and more familiar with the instrument meanwhile and that some smooth connections had already been established. However, there was a lot to do in the area concerning the technical part as one of the interviewees said. He admitted that the present toolkits did not give their users the variety and the freedom actually intended by the company.

The automotive sector with its representatives was the third industry which indicated usage of the method. Although they stated that the method was promising and provided a new way of obtaining client knowledge, just two of them assured us that there have already established connections to clients and they have achieved some results. There was another representative of the industry, who argued knowing the technique and using it to a “certain degree” what in his opinion meant that toolkits were distributed among clients but the feedback was more or less unsatisfactory.

Regarding the geographical diffusion it could be ascertained that in the United States the technique was more common among the companies as compared their Japanese and Western European counterparts (see section 3.8.2.). Further, Japanese companies were more familiar with the model than the European ones considering the percentage of positive responses received from these regions. However, the total number of respondents from Europe was higher than that from Japan and the United States. Therefore, our survey does not yield meaningful results as to the diffusion among regions.

Concerning the spread between the categories business-to-business and business-to-consumer it can be stated that companies in the former category were more familiar and eager to use the technique than the latter (see Figure 5.8.2.).

5.7. Incentives for Customers

The last question aimed at learning about how companies from various regions and lines of business whether they provide any incentives to consumers who are willing to share their knowledge to contribute to companies’ innovations. During the telephone interviews it became obvious that most companies either were not able or willing to discuss the matter or just gave us some answers which were rather vague. Three of the interviewed companies stated that the issue had a
confidential character and therefore could not be discussed. One of the telephone interviewees answered that this was not their business and that they knew that there was a reward programme, but he could not tell who was responsible for it and how the consumers could benefit from it. Another phone respondent told us that a customised product reflecting the customers’ ideas was quite rewarding in itself. Still other companies reported that they did not provide customers incentives whatsoever to contribute to the product development process.

Two European respondents stated that the reward depended, among other things, on the degree of newness of the idea and on its chances for market exploitation. The more unique the input was and the higher its probability of resulting in a marketable product, the bigger the incentives. However, none of the interviewees except for two (within the business-to-consumer area) was willing or able to provide any further information as to the question which form the incentive could take or about its value. One of the latter respondents (a US American company within the sports equipment business) told us that creative users were given vouchers or tickets for sports events. The other interviewee (an employee of a German car producer) revealed that (potential) customers coming up with new ideas or suggestions would be rewarded with a discount on the new car model (or any other car of the company).

It was ascertained that one of the companies which ‘misunderstood’ the Lead User Model and made statements concerning their focus groups of consumers, pointed out that there were “product rewards” for the customers willing to participate in the interview sessions.

Analysing the online questionnaire no statement regarding the different approaches in the different regions can be made due to the fact that there was not sufficient information from the companies as to how they reward innovative consumers. Some of the respondents did not answer the question or if they did they simply stated “yes” or “no”.

60
5.8. Summary

Summing up the outcome of the survey here is the right place to add some critical words about the analysis and the received responses. Having been rather optimistic about the response rate of the questionnaire we initially hoped to get a by and large representative picture of customer knowledge management for six industries and three geographic regions. Unfortunately, it turned out that this optimism was unfounded. The low response rate has, however, been compensated by a number of phone interviews which have proven to be much more successful. Although due to the relatively small number of responses no generalisations can be made, the research done may well serve as a starting point for in-depth future studies.

To recap, two figures show the different extent of diffusion regarding industries (Figure 5.8.1.) and categories (Figure 5.8.2.). It should be pointed out that the data underlying the figures represent the responses obtained through the e-mail questionnaires only the reason being that the integration of the results from the telephone interviews into statistics would lead to a distortion of the results since the interviews have been conducted in Europe only. The telephone responses by and large support the answers gained from the e-mail respondents, though.

Finally, it was checked if there was a non-response bias, since companies employing one or more methods to involve customers in their innovation processes might find it more interesting than those which do not let the customer participate in the development of new products to participate in the survey. This could be excluded: a non-response analysis (Armstrong & Overton 1977) comparing the earliest to the latest 10 percent of respondents\textsuperscript{14} did not reveal significant differences with regard to the usage of methods for obtaining customer knowledge nor with respect to a number of further variables. Hence, taking the results of the non-response bias analysis into account it can be assumed that the respondents answered rather truthfully.

\textsuperscript{14} The latest respondents of the e-mail questionnaire answered after having received a follow-up e-mail.
Figure 5.8.1. Diffusion of Instruments among Industries

Figure 5.8.2. Diffusion of Instruments among Categories
6. Conclusions

This section contains a summary of the paper, an explanation of the initial purpose, a comparison of the findings to the initial aims as well as critique of the approach.

6.1. Summary of the Dissertation

"Knowing what our clients know” is power which can result in new ideas and new products. A pyramid framework was chosen to structure the ideas with the insights of Nonaka’s and Takeuchi’s “The knowledge creating company” as a foundation, proceeding with global knowledge management and why knowledge is essential for the future competitiveness of companies referring to different authors. In the middle level of the pyramid three strategies for gaining and leveraging customer knowledge were outlined. Finally, on the top were three methods/techniques suggesting how customers’ specific knowledge can be capitalised upon.

The paper continues with a cross-sectional and cross-regional survey asking companies about the significance companies attach to the topic and, consequently, whether companies have established strategies to gain clients’ knowledge. Furthermore, the research aimed at finding out to which extent the methods portrayed in the theoretical part are used among the chosen industries and regions. The analysis of the low number of received answers does not yield generalised statements, yet indicates major differences between the various industries. Further, a “shift in mindset” could only be observed in a minority of companies.

“All men by nature desire knowledge” (Aristotle)

Unfortunately, not all companies desire customer knowledge.
6.2. The Authors’ Initial Intentions

We wanted to find out whether companies from different parts of the world, working in different industries, have realised the new challenge and have, consequently, established strategies to gain clients’ knowledge. Moreover, we wanted to give a state-of-the-art view of the described methods to obtain this knowledge and examine their degree of diffusion among the chosen industries and regions.

The sample has been carefully selected including companies dealing with flavours and fragrances and those active in the automotive industry due to the fact that companies serving industrial consumers take a very high interest in giving their clients a product exactly matching their mostly sophisticated demands since products on industrial markets are often rather complex, sometimes even unique. Also, customers on the consumer goods market may have highly specific demands for products which highly involve the consumers personally and emotionally, e.g. cars, sports equipment or entertainment electronics. Finally, companies from the food industry have been chosen due to the simplicity of creating new products from the clients’ point of view.

Our initial intention was to ascertain whether there any striking differences as to customer involvement in product development with respect to the selected regions and industries, whether companies have already developed corresponding strategies or at least recognised the importance of the clients’ knowledge.

6.3. Findings vs. Initial Intentions

As mentioned before, the initial intentions were to ascertain with the help of a survey whether companies have developed strategies to acquire the clients’ knowledge and to give a state-of-the-art view of the diffusion of the described methods for gaining and leveraging customer knowledge among industries and regions. We wanted to know whether companies have already understood and accepted the customer as a source of innovation.

The first question was linked to the global aim of the paper, namely to find out if companies have made serious endeavours to gain customers’ knowledge.
Interpreting the results of the survey it can be stated that the involvement of customers in the product development process differed greatly among the selected industries. To the majority of the responding companies gaining and obtaining customer knowledge does not seem to be a matter of strategic importance. A strategy is a plan that is intended to achieve a particular purpose (Oxford Advanced Learner’s Dictionary 2000), but this particular purpose could not be identified the majority of the companies. Many companies rather relied on knowledge about their customers (demands, preferences) than on knowledge of their customers (knowledge concerning the product) when developing new products.

The second research question was about the origin of companies’ innovations and whether a pattern with regard to the line of business or the geographic region can be identified. However, the low number of responses obtained through the survey does not allow inferences as to this question. Nevertheless, it can be said that the origin of innovations was mostly a mixture of efforts from inside and outside the companies and only a few companies have excluded the customer as a source of innovations.

The third research question was whether companies involve customers in the process of product development and whether there are any industry-specific or region-specific differences as to this question. The results gained through the questionnaire and the telephone interviews indicate that customers were mostly involved in the innovation process in so far as customer complaints and suggestions may serve as a starting point. Also, most of the responding companies let customers evaluate and test their prototypes. Some companies within the business-to-business area (flavours & fragrances, automotive) as well as a few companies serving the consumer market (sports equipment) reported to make use of customers’ product concepts (see Table 5.3.1.). Firms within the automotive sector turned out to be integrating customers the most closely: Some car supplier companies let customers develop (constructing) drafts. The low response rate of the survey does not allow conclusions as to region-specific differences regarding the third question.
The fourth research question was about the approaches/methods used by companies to obtain and leverage customer knowledge and whether they can be assigned to those discussed in the literature. As stated in the analysis (sections 5.4. to 5.6) some companies were familiar with the new techniques and used them, but many of the responding companies did not apply them or were not acquainted with them. Regarding this question the responses indicate industry-specific differences: companies producing car parts, flavours and fragrances, as well as cars and sports equipment employ them more often than do companies within the consumer electronics and food industry (see Figure 5.8.1.).

The fifth question was whether or how companies motivate/encourage customers to contribute to product improvements or innovations. Not surprisingly, no real “patterns” could be found in the answers given to this question. However, two companies within the business-to-consumer market revealed that innovative customers were rewarded by vouchers or discounts. It can be assumed that since the majority of the companies did not have any strategies to obtain and leverage innovation-specific customer knowledge, they consequently do not have an incentive scheme to reward customers for their efforts. On the other hand, the results can also be interpreted in the way that customers’ intrinsic motives to innovate are more important than extrinsic motives which would confirm what has been written in section 3.5. Maybe, incentives for user innovators should rather be seen as instrument of customer relationship management.

Summing up the findings it can be stated that at least one third of the interviewed companies (still) do not see customers as a (potentially) valuable contributor for product development and that they rather rely on their old practices regarding innovations as a largely internal matter. Another third of the companies have already recognised the important role of consumers’ knowledge for new ideas, but still do not reap the potential benefits of the available instruments for obtaining customer knowledge or do not pursue the matter with priority. However, some of them intend to enlarge their efforts and plan to apply the new methods (more determined) in the future. The remaining third of the interviewed companies argued that they have already been using the methods and have gained some experience with obtaining customer knowledge. Some of the responding firms
have been actively striving for customer knowledge since several years while others admitted that their efforts were still in the beginnings and that they were only just experimenting with ways to closer involve customers in their innovations processes.

Concerning the diffusion of the methods among the selected industries (see Figure 5.8.1.) it can be said that the automotive sector as well as car and sport equipment producers are using the lead user model. Car producers as well as manufacturers of flavours & fragrances and car parts reported to have gathered experiences with toolkits which are still quite new. Communities as a means of gaining customer knowledge were spread among the sports equipment and car industry and to a lesser extent by food producers and consumer electronics manufacturers. It should be pointed out, however, that some respondents did not understand the presented concepts quite the way academic literature suggests.

### 6.4. Suggestions for Improvement

Naturally, at the end one is always smarter than at the beginning. Therefore, we would like to add some critique to the sample and to the questionnaire. It should be noted that the pursued approach was partly influenced by restraints as to money and time. Certainly, a survey backed by bigger financial and temporal resources would have yielded more representative results. Notwithstanding the aforementioned limitations we tried our best to give a state-of-the-art-view of the customers’ role in companies’ innovation management.

#### 6.4.1. Critique of the Sample

Although the sample has been carefully selected, retrospectively, we have come to the realisation that too many industries and regions have been chosen making it difficult if not impossible to allow generalised statements regarding the aforementioned characteristics. It would have been wiser to focus the research on just one or two industries and not to differentiate regarding the geographic origin
of the companies. Proceeding like that would have allowed to consider the peculiarities of a given industry more deeply and to draw further conclusions. However, the decision to select companies by their industry turned out to be good since a company’s benefits and possibilities to involve customers has proven to depend a good deal on its business. More generally, a larger sample size would have been necessary to make generalisations. Finally, finding Japanese companies within a particular industry turned out to be a quite laborious undertaking since we solely relied on the internet as a source of information. Any form of yellow pages would have saved a lot of time here.

6.4.2. Critique of the Questionnaire

Having analysed the received answers and bearing in mind the low response rate we think that some improvements can be made with respect to the questionnaire. Starting enthusiastically and wanting to find out as much as possible about companies’ endeavours to involve customers in product development we have designed a questionnaire which was maybe quite strenuous to complete. Furthermore, a direct contact in the chosen companies has proven to be indispensable to guarantee competent answers and to sort out any misunderstandings of the posed questions. This is, however, a matter consuming a lot of time and money. Nevertheless, phone interviews can be seen as the more suitable means to answer the research questions as compared to an e-mail questionnaire. One suggestion as to the design of the questions is to use a Likert-scale to facilitate the analysis of the answers especially when receiving a large number of answers. A further advantage combined with scale-type answers is its simplicity and convenience for the respondents. Another improvement can be added regarding the formulation of the questions. For example, when conducting the phone interviews we have found that the first question was rather prone to misunderstanding. “Obtaining and making use of knowledge of the customer” has been largely understood in a way that companies learn about the customer’s demands and preferences. Further, in question number three we could have asked “In how far are customers involved in the innovation process […]” instead of “To what degree are customers involved in the innovation...
process […]” which would have been more neutral because the arrangement of the suggested answers might have lead respondents to think that the degree of involvement increases from the very left to the very right answer option.
7. Further Research

The research undertaken in this paper can only be regarded as a starting point for further in-depth analyses regarding companies’ endeavours to involve customers on a cross-sectional and international basis. Although no generalisations can be made from the survey at hand, it may well inspire researchers to undertake further investigations in the area. Generally speaking, it is recommendable to conduct further surveys with a far bigger sample size to be in a position to make solid statements concerning the research questions. Further, it would be interesting to analyse other industrial sectors or regions and to compare the results. To determine whether any trends can be observed in the course of time a longitudinal study would be of interest.

Apart from quantitative analyses it seems worthwhile to conduct qualitative research. For example, the success or failure of various strategies and means employed by companies would be an interesting object of further investigations. Case studies in this area would certainly yield new knowledge concerning this question. Moreover, it can be assumed that more instruments aiming at obtaining innovation-relevant customer knowledge exist besides those presented in the paper. Questions regarding this issue could be how they work, whether or not these methods come up to their goal and, if this turns out to be the case, whether or not these methods can be used in other companies within the industry or other lines of business as well.

Another object of further analyses could be to identify and quantify the costs and benefits of various methods for involving customers in the innovation process. Since the various instruments for customer integration involve differing financial resources it might well be the case that small-sized companies cannot employ all of them. Hence, it would be interesting to see which instruments are most suitable for this category of companies.

Finally, research could be done as to the influence of customer involvement on the buyer-seller relationship. It is conceivable that including customers in (phases of) the product development process positively affects their level of satisfaction or their loyalty.
References


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Background information:
Empirical research has found that users rather than manufacturers are the actual developers of many or most of the products and services. The main purpose of our research is to find out if or how companies operating in different industries involve customers in their innovation processes. Academic literature suggests instruments like the lead user model, user communities and user toolkits for customer involvement. We would like to learn if companies apply strategies and methods presented by theorists or if they have their own ways of using knowledge of their customers in innovation processes.

Please put your answers in the grey boxes. If you want to indicate that a specific answer applies, please use an ‘X’.

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<th>1. Is there staff in your company that is exclusively or mainly concerned with obtaining and making use of knowledge of the customer?</th>
<th>Yes …</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>…about __ people.</td>
</tr>
<tr>
<td>If yes, since when?</td>
<td>About __ years.</td>
<td>Don’t know.</td>
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</table>

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<th>often</th>
<th>sometimes</th>
<th>never</th>
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<td>From inside the company.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From outside the company …</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Companies from the same industry</td>
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<tr>
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<tr>
<td>Universities, research institutions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint efforts of people from inside and outside the company</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>If other source, please state here:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. To what degree are customers involved in the innovation process of your company?

<table>
<thead>
<tr>
<th>Not at all.</th>
<th>Customer complaints may serve as a starting point.</th>
<th>Customer suggestions may serve as a starting point.</th>
<th>Customers create product concepts.</th>
<th>Customers develop (constructing) drafts.</th>
<th>Evaluate prototypes.</th>
</tr>
</thead>
</table>

4. Does your company use the lead user model? [Integrate intensive users of a product into the development process of a product. These users are acquainted with the product’s details and may have a great interest in improving it or creating a solution to a specific problem]

<table>
<thead>
<tr>
<th>Yes.</th>
<th>No.</th>
</tr>
</thead>
</table>

If yes, since when? | About _ years. | Don’t know. |

5. Is there a user community for any of your company’s products? [A communication platform with the aim of sharing knowledge and experiences and solving problems with other users of a product]

<table>
<thead>
<tr>
<th>Yes.</th>
<th>No.</th>
</tr>
</thead>
</table>

If yes, since when? | About _ years. | Don’t know. |

If yes, is it operated by your company? | Yes. | No. |

6. Does your company use toolkits in order to shift a part of the innovation process to your customers? [equipping the users with tools to design new products or prototypes themselves]

<table>
<thead>
<tr>
<th>Yes.</th>
<th>No.</th>
</tr>
</thead>
</table>

If yes, since when? | About _ years. | Don’t know. |
7. Does your company provide any incentives to motivate /encourage customers to think about product improvements or innovations? [If yes, how?]

| Yes. | No. |

Thank you for taking your time to fill in this questionnaire. Please send it back to ClausFroehlich@gmx.net until 12th of December.
In case you have any other interesting information about this field you would like to let us know, please feel free to contact us. If you are interested in the outcome of our study, we are pleased to send it you a brief summary.

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fax +46 44 125 825

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