

Using Human Service Center Interfaces and their Information to Foster Innovation Management

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Abstract. Doubtless innovation is a key for long-term success of any cooperation. However, empirical research indicates limited success of innovation management in practice. Not surprisingly companies are reinforcing their efforts and set a strong focus on customer integration since it has been identified as a major aspect of successful innovation management, current examples being open innovation, integration of social communities and learning communities. Most of these methods are directed towards a special group of customers, the so-called lead-users. This selected integration already led to noticeable progress in some companies and industries, but includes some critical drawbacks, especially since it neglects the majority of a company's human client interactions, which happen in the often centralized service centers, e.g. call centers. Our analysis has identified that these contacts can make a significant contribution to improving a company's innovation management, e.g. through evaluating existing customer-related information. Therefore our research focuses on the adoption of current methods of client integration for a wider audience via service centers. This paper presents the results of expert interviews, case studies and state-of-the art analysis that we conducted in this context. After a discussion of restrictions, benefits and potential results for this form of client interaction, a requirement framework for a support system will be introduced. Subsequently a service blueprint for a support system solution will be presented which was developed based on the requirement framework via quality function deployment in cooperation with reference companies, followed by an overview of further related research questions and information on planned implementations of the support system.

1 Introduction

Numerous authors and studies identified innovation management as one of the major success factors for an organization ([3]; [13]; [28]; [34]; [46]). In particular for a resource-scarce country such as Germany innovations are indispensable ([12]; [45]), since they are the source for competitiveness and prosperity [60]. Therefore, one finds professionalized innovation structures in most mid-to-large-sized companies. One major characteristic of this professionalization is the increased use of information technology.

Nevertheless, success factors of innovation management solutions are unsatisfying. Globally just about six percent of all corporations are regarded as effective in usage of innovation management [36]. Former studies reveal that only 0.6 to 2.0 percent of all ideas are successfully introduced to markets. Even those introduced to markets have success rates of between 21 to 26 percent [51]. Moreover, current results even indicate deterioration ([17]; [30]). Though, companies undergo immense efforts through their Customer Relationship Management (CRM) or market research the lack in predictability of market and customer behaviors could not be overcome.

Based on this discrepancy a large variety of practical methods and tools has been developed to actively incorporate customers as well as their information into innovation management activities. The importance of the topic can be seen in the increased innovation budgets, which despite the recent economic crisis have on a global scale risen by 4.2 percent p.a. and by 2.3 percent p.a. in Europe ([1]; [36]).

2 Problem Statement

With these new solutions some companies integrate customers as partners into development and exploration activities. Partly, the innovative ability has been improved through this opening of activities. Examples are the incorporation of the wisdom of crowds [55], solutions for requirement engineering [21], collaborative work, computer-aided design toolkits ([44]; [59]), mass collaboration [39] communities of practice or learning communities, idea market places or in general all open innovation approaches ([13]; [38]).

Almost exclusively these solutions are directed towards a special customer group able to cooperate on eye height with companies. This leads to major challenges. First, companies already communicate with many customer groups, including lead-users. Seldom, these customer interactions are used for innovation purposes. As a result current lead-user integration approaches have difficulties with the identification of appropriate customers already in regular contact with the enterprise [53].

Second, this selective approach excludes the majority of customers from innovation activities [56]. Though, customer understanding, especially of the average customer or the masses of demands, and the ability to incorporate customer views determine the later success of products or services ([14]; [57]). Customers that are neglected often can be characterized by one or more of the following qualities: low or no product affinity ([52]), high satisfaction, slight but no strong dissatisfaction, little switching costs [40], little revenue potential per single user [56] and ordinary application range of a company's offer [23]. Hence lead-user focused approaches could have difficulties with its general representativeness, its significance for operative areas such as pricing [23] and limited validity for mass customization markets [56]. Additionally, offers on the mass market become increasingly diverse ([5]; [59]), but the strong focus only on sophisticated customers can hardly support the growing complexity the markets. Consequently, a broadening of active customer integration on a wider, more representative base is of great importance. Also, research findings in this area are seldom translated into successful practical usage which underlines the necessity of more practicable solutions [51].

Service Centers represent a promising starting point for an expansion of the active customer integration. Corporations already bundle their customer interactions in centralized departments, often called customer service center. These centralized units already handle the largest part of customer contacts in many companies [54]. Surprisingly these interactions and the according information are to a large extent not used for innovation activities [11], although it is used for sales or efficiency purposes.

This complex of problems has grown over the last decade. First, time for reproduction of products has declined, leading to shorter amortization periods for new developments ([14]; [43]). Second, markets have matured and therefore a differentiation, specifically for companies from developed markets, can only be achieved through innovative products ([22]; [28]). Third, the recent economic crisis has increased the pressure to cut also innovation costs ([14]; [28]). As a result, companies are confronted with the challenge of faster development cycles, with lower error margins at reduced resources. As a consequence, they focus increasingly on existing resources and information. Therefore also existing customer interactions have to be exploited to the full potential. Interestingly, hardly any appropriate approach, holistic concept or technical solution exists on how existing customer interaction and the according information can be used for innovation purposes [6].

In order to develop a solution for a support system that addresses the shortcomings of the current approaches we assessed the special characteristics of the customer interactions in service centers, especially in the light of their integration into innovation management. Based on the advantages, disadvantages and the circumstances in practice we identified a requirement framework which we later translated into a service blueprint with functionalities that fulfills these requirements. The results and our concrete approach will be presented in the following paragraphs.

3 Background and Methodology

A considerable amount of research has already been conducted for the subjects of innovation management, customer interaction and service center already. Additionally there are numerous interfaces with other close related research areas such as CRM, knowledge management, market research and organizational learning, but also with more distant disciplines like psychology. Our state-of-the art analysis of the existing literature and research [27] identified a large variety of relevant literature and research. Surprisingly a substantial number of recent research, especially quantitative research, exists which deals with different aspects of the topic ([8]; [15]; [19]; [33]; [41]; [53]). This quantitative research ranges from different types of customer integration [37] over motivation factors for participating customers to success of customer ideas and from approaches in innovation management over the variety of IT-solutions [7] to the concrete success of innovative products.

However, no research could be identified that combines these findings in the light of active customer integration in service centers. In order to develop such a holistic understanding and to analyze its special characteristics a detailed analysis is needed which compares the already available existing findings. Moreover, the level of detail in the existing quantitative studies is mostly inappropriate to draw direct conclusions for an application as targeted in our research goal. Therefore, the first focus is on

qualitative research which delivers a more detailed perspective [50]. Additionally, due to the explanatory research question, single subject matters are appropriate [61]. The complexity of the topic, the interfaces with other disciplines and the lack of in-depth information underline the necessity of qualitative methods such as expert interviews and case studies to develop a first understanding and first solutions in this area [26]. This approach is based on the grounded theory by Glaser and Strauss [31] in which close to reality theory is developed based on empirical data.

Guideline-based interviews [9] have been conducted with industry experts. By starting with a fixed questionnaire it was assured that all topics were covered in each interview and that answers have a high degree of comparability by at the same time allowing enough freedom to identify new aspects [61]. Starting point for the expert selection was the structure of the German industry. In order to maximize the relevance of our findings even with a smaller number of interviews we chose experts from the four largest German economic sectors representing 92 percent of all employees [29]. Additionally, we choose experts from different companies in each sector ranging from small-sized companies with less than 50m EUR in revenues 2009 to companies with over 5bn EUR in revenues to prevent biased results. Also, we included officers in charge of service centers, innovation management and customer contacts to get a preferably more complete picture. In total fourteen experts from eight companies have been interviewed in the first phase, each in a two hour interview. Results have been documented and confirmed back with the interviewees.

The same approach was used to identify requirements for a support system. Guideline-based interviews were used to identify a list of requirements which was then combined with all requirements identified throughout the state-of-the-art analysis. Then, the single requirements were evaluated by the experts. In particular two characteristics were evaluated, necessity and impact. In the first round each expert had one vote with which an unlimited number of items could be marked as indispensable. Items with a majority vote were labeled as basic requirements. In a second step the additional value provided by the fulfillment of each of the remaining items was estimated. No further breakdown of the term additional value was provided since each expert and company has a different set of values demanded to innovation solutions. Some companies put faster processes in the middle of their attention, some aim at more accurate forecasts and others target resource savings. The individual assessments were aggregated and based on this view we derived three further requirement categories reaching from requirements of high, medium to low priority.

In the next step the method of Quality Function Deployment (QFD) very common in engineering science and quality management was used to derive a set of functions that fulfill the identified requirements ([15]; [32]). By applying the House of Quality, a tool for translating requirements into functionalities [2], we derived in close cooperation with experts from two companies a set of functionalities. Many of the developed functionalities were identified in the state-of-the-art analysis and in the expert interviews. Several iterations have been conducted to arrive at a complete blueprint. The blueprint as the result of this process covers all identified requirements with at least one function. The sufficiency of this coverage shall be evaluated in further research. An overview of the findings will be provided in the next chapter.

4 Results

Out of the vast variety of available literature and the state-of-the-art interviews a list of disadvantages and set of opportunities has been developed. This process and its result have been presented in earlier publications [20]. Potential restrictions can be divided into two categories, restrictions on the customers' and on the companies' side.

An important disadvantage linked to customers is the limited knowledge and experience of customers [55], especially of non lead-users [45], and missing technical language [58] that could result in e.g. communication issues. Additionally, motivating customers to cooperate could be another concern [4]. Moreover, increased expectations of participating customers are a potential thread too ([48]; [59]).

Within corporations one can differentiate between three kinds of barriers, the barriers of not-wanting, not-permitting and not-knowing [18]. In some companies there is a tendency to not accepting external input in general. In other cases employees do not have enough resources to conduct innovation activities ([6], [49]). Also, innovation success is blocked by the inability of internal staff to fulfill related tasks ([18]; [47]) or a lack in existing structures [42].

Nevertheless, the analysis of potential restrictions has neither identified any issue that is ultimately contradicting the research goal nor any issue that in general prevents a successful solution development [20]. However, all concerns have to be addressed by a potential solution. Whether all barriers can be overcome by a solution has to be evaluated by developing, testing and analyzing potential solutions. Besides downfalls there is also a variety of benefits supporting the continuation of the research.

4.1 Appropriateness of Service Center Contacts for Innovation Management

Our analysis revealed a set of detailed aspects that are supporting the capability of a service center's customer contacts to improve the innovation ability of corporations [20]. In total these aspects can be comprised in ten categories. At first, the customer interactions in service centers provide a multiplicity of types of innovation-relevant information [25], the usage and evaluation of this existing information can already be beneficial. The representativeness of these contacts is another benefit [42]. Moreover, the depth of information [16] and its wide spectrum [52] can be beneficial, especially in the important area of customer behavior [24]. Additionally, information retrieval in service centers limits information losses through third parties [57] and can be faster due to existing efficient structures in most service centers [13]. The reoccurring nature of service center contacts allows precious iterations with customers. Interestingly, these customer interactions are also said to provide valuable input for all different innovation types [59] as well as for each step of the innovation process [8].

Based on the potential innovation areas by Ulwick [57] we analyzed whether customer center contacts are able to support different innovation areas. In cooperation with the industry experts each of Ulwick's four areas was analyzed in light of whether available customer center information could provide additional value to support innovation success. Eventually for each category several application areas were identified in which customer center contacts and their information could be beneficial. Table 1 presents some examples of this additional value.

Table 1. Examples for added value by customer center contacts for different innovation areas

Innovation Areas	Examples for Service Center supporting the specific Innovation Area
Product/Service Innovation	Identification of weaknesses in product offerings, e.g. incident reports Development of offer based on weaknesses in consultation with clients
Process Innovation	Identification of gaps in value performance, e.g. customer complaints indicate late delivery, slow response times etc. Improvement in value performance gaps in close consultation with clients
New Market	Recognition of under or overachieved customer requirements through analysis of customer behavior, which allow targeting new customer groups Overachieved aspects signaled by frequent usage problems and customer requests inappropriate usage of products could signal new application areas
Disruptive Innovation	Identification of overfulfilled customer requirements by analyzing usage figures, e.g. features that are not or hardly used and mentioned by customer in any kind of interaction might not be needed in a next product or service

4.2 Requirements Framework

Through the complete process of requirement identification a list of 43 different items has been developed. However, the items were initially not compared or ranked against each other. For this purpose the before described evaluation process was conducted. Based on this assessment, four requirement categories were developed [20]. Basic requirements contain all items that are absolutely essential and can't be missed in any solution. High priority requirements all provide an in average high additional value if added to the solution and are in addition regarded as essential by parts of the expert group. The category of medium priority contains items with medium to high additional value that are not regarded as essential by any expert. In the fourth category, that of low priority, all items with a lower than average additional value are comprised. Figure 1 illustrates this requirements framework. For illustration purposes, we bundled the single items into thematic groups.

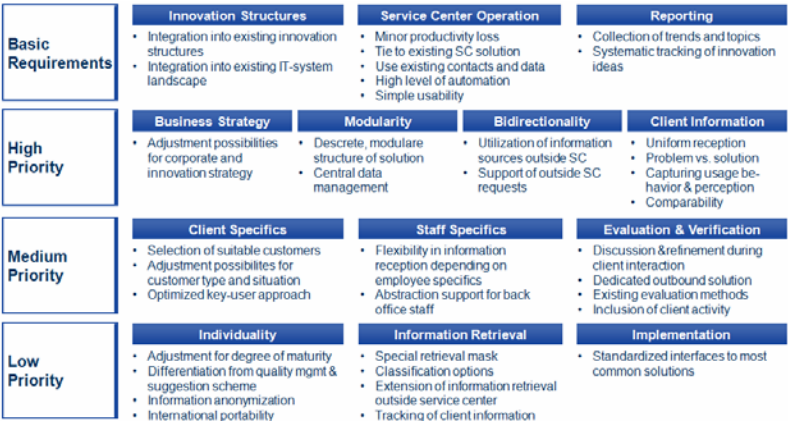


Fig. 1. Set of requirements for integrating service centers into innovation management

4.3 Functionalities for Support Solution

The complete set of requirements served as the starting point for the identification of necessary components and functionalities of any support solution. The method of QFD which was applied differentiates four levels, customer requirements, functionalities, quality characteristics and parts [2]. The House of Quality was used for the first transformation from requirements to concrete functions.

Resulting from the application of the House of Quality was a list of in total 83 single functionalities. The individual functionalities are characterized by a large discrepancy in complexity. Some of these functionalities are likely to be provided with comparable few resources, such items are automated spelling checks, tapping existing data sources and automated creation of data base entry. Other items might present a severe effort towards a successful solution development, examples are the assignment of the appropriate employee, support in abstracting available client information and referencing between various data sets.

The entire set of functionalities was then analyzed for interdependencies. Based upon this analysis the single items were set into chronological and hierarchical order. For this purpose the service system modeling technique by Boettcher [10] was applied. With this technique it is possible to consolidate numerous service items into a single comprising model. The underlying metamodel differentiates four different categories: resources, services, products and processes [10]. As a result the single function items were bundled and put into several task groups comprising several functionalities. Moreover, the eighteen categories were again aggregated to a set of five main services. The first two levels of the overall support model, the main tasks and the service groups, are shown in Figure 2. A specific presentation of each function attached to the task groups is not illustrated due to space constraints.

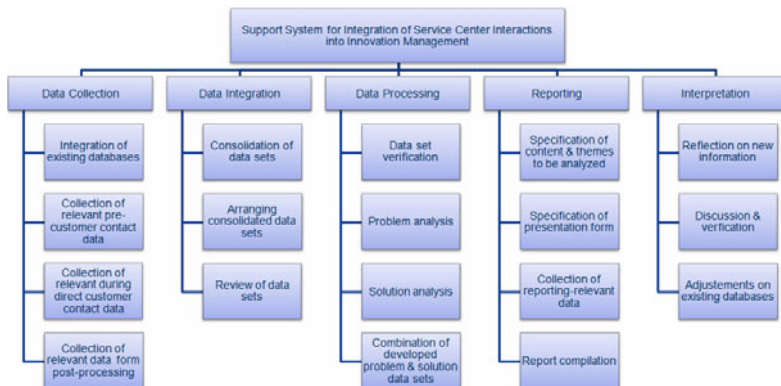


Fig. 2. First two levels of the support system model for service center integration

5 Conclusion and Outlook

Our analysis has shown the necessity of further examining customer interactions within service centers in the light of innovation. These contacts, i.e. the incorporated information, are identified to contain enormous potential to further improve existing innovation solutions. As shown, current market requirements foster effort towards an

innovation management that builds on existing resources. Our research identified a variety of requirements and barriers that have to be overcome in order to implement a functioning support system solution in practice. These requirements have been translated to a set of functionalities directed at fulfilling the identified specifications.

In a next step the arranged functionalities have to be put into a complete process for the active customer integration that can be applied in various kinds of service centers. Therefore, each function has to be elaborated in detail, building on the already existing level of detail from the service system modeling. Additionally, the concrete development of an IT-solution is already ongoing. This solution, fulfilling all requirements, will be used to test the validity of both functionalities and requirements. Therefore, the solution will be implemented and tested in the service centers of two companies which will serve as real-life case studies. We are already in the planning phase with these two committed partner companies, one in the professional service sector and one machine construction company. Therefore the support system model will be integrated into the existing process structures and into system landscape of those companies. This procedure might lead to within the existing support system model or maybe to adjustments of the reference companies' internal process structure. In addition, our research will be accompanied by a continuous analysis of restrictions, e.g. of the legal perspective since call centers in particular have been set under strict regulations in Germany [35]. With this procedure a valid statement about the potential of service center customer interactions for innovation purposes should be possible.

References

- [1] Accenture, Innovation – a Priority for Growth in the Aftermath of the Downturn. Accenture, Atlanta (2009)
- [2] Akao, Y.: Quality Function Deployment. Verlag Moderne Industrie, Landsberg (1992)
- [3] Albach, H.: Innovationsstrategien zur Verbesserung der Wettbewerbsfähigkeit. Zeitschrift fuer Betriebswirtschaft 59(12), 1338–1352 (1989)
- [4] Allen, R.C.: Collective invention. Journal of Economic Behavior and Organization 4, 1–24 (1983)
- [5] Anderson, C.: The Long Tail. Hyperion, New York (2008)
- [6] Auer, S., Faehnrich, K.-P., Riechert, T.: SoftWiki – Agiles Requirements-Engineering fuer Softwareprojekte mit einer großen Anzahl verteilter Stakeholder. GeNeMe' 06 – Gemeinschaft in neuen Medien, Dresden (2006)
- [7] Ardilio, A., Auernhammer, K., Kohn, S.: Marktstudie Innovationssysteme - IT-Unterstützung im Innovationsmanagement. Fraunhofer IRB Verlag, Stuttgart (2004)
- [8] Bessant, J.: High Involvement Innovation: Building and Sustaining Competitive Advantage Through Continuous Change. John Wiley, Chichester (2003)
- [9] Bogner, A., Littig, B., Menz, W.: Das Experteninterview – Theorie, Methode, Anwendung, 2nd edn. VS Verlag fuer Sozialwissenschaften, Wiesbaden (2005)
- [10] Boettcher, M.: Architektur integrierter Dienstleistungssysteme (Dissertation). University of Leipzig, Leipzig (2009)
- [11] Bughin, J., Chui, M., Johnson, B.: The next step in Open Innovation. McKinsey Quarterly, 22–29 (Fall 2008)
- [12] Bullinger, H.-J., Auernhammer, K.: Innovationen im Spannungsfeld von Kreativität und Planung. In: Warnecke, H.-J., Bullinger, H.-J. (eds.) Kunststueck Innovation, pp. 29–34. Springer, Berlin (2003)

- [13] Chesbrough, H.W.: The Era of Open Innovation. MIT Sloan Management Review, 35–41 (Spring 2003)
- [14] Christensen, C.M.: The Innovator's Dilemma, 1st edn. Collins, New York (2006)
- [15] Cristiano, J.J., Liker, J.K., White, C.C.: Customer-driven product development through quality function deployment in the U.S. and Japan. *Journal of Product Innovation Management* 17(4), 286–308 (2000)
- [16] Den Hertog, P.: Managing Service Innovation. Dialogic, Utrecht (2010)
- [17] Duethmann, C.: Marken sind von Dauer. *Lebensmittel Zeitung Spezial* 2, 8–10 (2008)
- [18] Enkel, E.: Chancen und Risiken von Open Innovation. In: Zerfaß, A., Moeslein, K.M. (eds.) *Kommunikation als Erfolgsfaktor im Innovationsmanagement*, 1st edn., pp. 177–194. Gabler, Wiesbaden (2009)
- [19] Ernst, N., Zerfaß, A.: Kommunikation und Innovation in deutschen Unternehmen. In: Zerfaß, A., Moeslein, K.M. (eds.) *Kommunikation als Erfolgsfaktor im Innovationsmanagement*, 1st edn., pp. 57–83. Gabler, Wiesbaden (2009)
- [20] Faehnrich, K.-P., Strehl, B.U.: Anforderungen an ein IT-gestuetztes Kundeninnovationsmanagement im Customer Service Center. In: Faehnrich, K.-P., Franczyk, B. (eds.) *Informatik 2010. Service Science*, vol. 1, pp. 82–88 (2010)
- [21] Faehnrich, K.-P., Meyer, K., Boettcher, M.: Service Engineering IT-basierter Dienstleistungen – neue Perspektive durch ein integriertes Co-Design. *IM – Fachzeitschrift fuer Information Management & Consulting* 4, 19–25 (2008)
- [22] Faehnrich, K.-P., Meiren, T.: Service Engineering. In: Spath, D., Faehnrich, K.-P. (eds.) *Advances in Service Innovations*, pp. 3–16. Springer, Berlin (2007)
- [23] Fetterhoff, T.J., Voelkel, D.: Managing open innovation in biotechnology. *Research-Technology Management* 49(3), 14–18 (2006)
- [24] Fiol, C.M., Lyles, M.: Organizational Learning. *Academy of Management Review* 10(4), 803–813 (1985)
- [25] Franke, N., von Hippel, E.: Satisfying Heterogeneous User Needs via Innovation Toolkits – The Case of Apache Security Software. *Research Policy* 32(7), 1199–1215 (2003)
- [26] Fredberg, T., Elmquist, M., Ollila, S.: Managing Open Innovation – Present Findings and Future Decisions. Chalmers University of Technology, Goeteburg (2008)
- [27] Galliers, R.D.: *Information Systems Research – issues, methods and practical guidelines*. Blackwell Scientific Publications, Oxford (1992)
- [28] Gassmann, O., Enkel, E.: Open Innovation. *Zeitschrift Fuehrung + Organisation* 3, 132–137 (2006)
- [29] German Census Bureau. *Arbeitsmarktstatistik 2009* (2010), <http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Grafiken/Arbeitsmarkt/Diagramme/Erwerbsbereiche,templateId=renderPrint.psml> (retrieved May 10, 2010)
- [30] GfK, ConsumerScan Innovation Day: Launches und Relaunches als Motor der Wertschoepfung – Was ist Top, was ist Flop?. GfK, Nuernberg (2006)
- [31] Glaser, B.G., Strauss, A.L.: *The Discovery of Grounded Theory – Strategies for Qualitative Research*. Aldine Transactions, New York (1967)
- [32] Govers, C.P.M.: What and how about Quality Function Deployment (QFD). *International Journal of Production Economics*, 46–47, 575–585 (1996)
- [33] Gruner, K., Homburg, C.: Does Customer Interaction Enhance New Product Success. *Journal of Business Research* 49(1), 1–14 (2000)
- [34] Hauschildt, J.: *Innovationsmanagement*, 3rd edn. Vahlen, Munich (2004)
- [35] Huettenegger, G.: *Open Source Knowledge Management*. Springer, Berlin (2006)
- [36] Jaruzelski, B., Dehoff, K., Bordia, R.: Smart Spenders – The global innovation 1000. *Strategy and Business* 45, 46–61 (2006)

- [37] Jokisch, M.: Active integration of users into the innovation process of a manufacturer – The BMW Customer Innovation Lab. Dr. Hut, Munich (2007)
- [38] Kok, R.A., Hillebrand, W.B., Biemans, W.G.: What makes Product Development Market Oriented? Towards a Conceptual Framework. *International Journal of Innovation Management* 7(2), 137–162 (2003)
- [39] Libert, B., Spector, J.: *We are smarter than me*. Wharton School Publishing, Upper Saddle River (2007)
- [40] Luethje, C.: Characteristics of Innovating Users in Consumer Goods Field. *Technovation* 24(9), 683–695 (2004)
- [41] Matthing, J., Sanden, B., Edvardsson, B.: New service development. *International Journal of Service Industry Management* 15(5), 479–498 (2004)
- [42] Meffert, H.: *Marketing*, 7th edn. Gabler, Wiesbaden (1986)
- [43] Meyer, K., Faehnrich, K.-P.: How to Engineer IT-enabled Services. In: *Proceedings of First International Symposium on Service Science*, pp. 137–148. Logos, Berlin (2009)
- [44] Moschella, D.: *Customer-driven IT*. Harvard Business School Press, Boston (2003)
- [45] Opitz, M.: *Organisation integrierter Dienstleistungssysteme*. Gabler, Wiesbaden (2009)
- [46] Pearson, A.E.: Tough-minded ways to get innovative. *Harvard Business Review* 66, 99–106 (1988)
- [47] Read, B.B.: *Designing the Best Call Center for Your Business – a complete Guide for Location*. In: *Service, Staffing, and Outsourcing*, 2nd edn. CMP, San Francisco (2005)
- [48] Reichwald, R., Piller, F.: *Interaktive Wertschoepfung - Open Innovation, Individualisierung und neue Formen der Arbeitsteilung*, 2nd edn. Gabler, Wiesbaden (2009)
- [49] Schumacher, J., Meyer, M.: *Customer Relationship Management strukturiert dargestellt – Prozesse, Systeme, Technologien*. Springer, Heidelberg (2004)
- [50] Schwanninger, M.: *Zur Zukunft der systemorientierten Managementforschung*. Institut fuer Betriebswirtschaft, St. Gallen (1989)
- [51] Schweisser, W., Mohnkopf, H., Hartmann, M., Metze, G.: *Innovationserfolgsrechnung*. Springer, Berlin (2008)
- [52] Sohn, G.: *Call Center World – Mangelhaftes Management der Kundenkontakte* (2007), <http://www.presstext.at/news/070122020/call-center-world-mangelhaftes-management-der-kundenkontakte/> (retrieved September 10, 2010)
- [53] Spann, M., Ernst, H., Skiera, B., Soll, J.H.: Identification of Lead Users for Consumer Products via Virtual Stock Markets. *Journal of Production Innovation Management* 26(3), 322–335 (2009)
- [54] Surowiecki, J.: *The Wisdom of Crowds*. Abacus, London (2005)
- [55] Tapscott, D., Williams, A.D.: *Wikinomics: How Mass Collaboration Changes Everything*, 1st edn. Penguin Group, New York (2008)
- [56] Tidd, J., Bessant, J., Pavitt, K.: *Managing Innovation*, 3rd edn. John Wiley & Sons, Chichester (2005)
- [57] Ulwick, A.: *What Customers Want: Using Outcome-Driven Innovation to Create Breakthrough Products and Services*. Mc Graw-Hill, New York (2005)
- [58] Ulwick, T., Lawer, C.: Avoid the risks of customer-driven innovation. In: OMC (eds.) *OMC Group Insight*, Buckingham, pp. 1–5 (2007)
- [59] Von Hippel, E.: *Democratizing Innovation*. MIT Press, Cambridge (2006)
- [60] Warnecke, H.-J.: Innovationen in Technik und Gesellschaft. In: Warnecke, H.-J., Bullinger, H.-J. (eds.) *Kunststueck Innovation*, pp. 1–10. Springer, Berlin (2003)
- [61] Yin, R.K.: *Case Study Research – Design & Methods*, 4th edn. Sage Publications, Thousand Oaks (2009)