Collaboration with Customers – Understanding the Effect of Customer-Company Interaction in new Product Development

Per Kristensson
Karlstad University
Service Research Center
Per.Kristensson@kau.se

Anders Gustafsson
Karlstad University
Service Research Center
Anders.Gustafsson@kau.se

Lars Witell
Karlstad University
Service Research Center
Lars.Witell@kau.se

Abstract

Customer co-creation is becoming increasingly popular among companies, and intensive communication with the customer is generally seen as a determinant of new product success. However, there is still limited insight into what interaction with customers really is. The most recent thinking argues for an understanding of value-in-context in order to co-create value with customers. The question, then, is how value-in-context can be captured and how this knowledge can be beneficial in the development process. In essence in order to capture this type of information a company needs to interact and communicate with their customers. However, this communication process has not been properly analyzed. In the present study we analyze customer collaboration based on four separate dimensions – frequency, direction, modality, and content – in order to understanding the value of customer collaboration. The data comes from a survey of 207 managers with experience of new service and product development. The paper concludes that three of the four dimensions of customer collaboration have a significant positive effect on New Product Development performance and Market Share development.

1. Introduction

“You know better than anyone else what you want from Starbucks. So tell us. What’s your Starbucks Idea? Revolutionary or simple – we want to hear it” (www.starbucks.com). This is one of many examples of how companies are trying to involve their customers in the co-creation or co-development of new services [44]. These companies view their customers as important resources when they develop new products [31]. Many companies rely on the competencies of their customers or users, including Dell, P&G and Google; these companies would not resort to customer co-creation if they did not feel that it benefited their innovation efforts.

Despite this trend, research has only superficially addressed the process through which customers co-create with companies. There is a general agreement that co-creation with customers is beneficial, but there is a lack of agreement regarding how and why. Furthermore, when describing the essence of the Service-Dominant Logic, [21] contended that collaboration with customers for the purposes of innovation is a foundational part of marketing today and that the collaboration regards “shared inventiveness” (p. 11). This indistinctness is also seen in [31], who concluded that “informed, networked, empowered, and active consumers are increasingly co-creating value with the firm” (p. 1). The specific actions and behaviors that make up the collaboration are yet to be fully addressed [44]. Consequently, it is important to research this question since knowledge about customers is gained in the collaboration processes between organizations and their customers [19]. The process of communication and the socially richer interactions has been argued to be one of the determinants for new product success [14, 22]. The focus in this paper is on how this communication process with customers should be managed in order to improve product and market success.

Consequently, the purpose of this study is to gain a better understanding of the process of customer collaboration in the development process. This is done by applying an established four dimensional model that have been used previously to analyze marketing channel communication (see, e.g., [25] and [3]). The four dimensions are frequency, direction, modality, and content. Although the importance of communication both with customers and within companies have been stressed in previous research (eg. [14], [15], and [19]) we have not found any empirical investigations of customer collaboration where theories from the literature on communication have been used to get a deeper understanding of the empirical phenomenon.

This article starts by describing some recent work on value-creation before providing a conceptualization of the dimensions that underlie customer collaboration. Then, because of the claimed relationship between co-creation and customer knowledge, the article also examines how the
dimensions given by the conceptualization influence the performance of the development process.

2. Conceptual framework

2.1 Understanding value-creational processes

From the service-dominant logic perspective, a market offering is attractive if it captures an offering’s value-in-context [40]. The focus, therefore, is not on the offering per se but on the customers’ value creation process, in which value for customers emerges [13]. [40] claimed that value is not created until the customer integrates and applies the resources of the service provider with other resources in their own context. Value is always contextually specific and is always determined by the beneficiary or the customer.

Consequently, the value-creation process should be the focal point during the development of new offerings. Accordingly, companies have started to treat their customers as active collaborators when developing various offerings. This contrasts with the traditional view of customers as passive informants from whom information can be extracted by means of surveys or focus groups. In line with this, [44] showed that new offerings developed through market research techniques based on collaboration with customers are more profitable than those developed with traditional market research techniques. In order to understand this conceptually, one of the distinctions made in the literature is between responsive and proactive market orientation [29]. A responsive market orientation refers to a business’s attempt to understand and satisfy its customers’ expressed or spoken needs, whereas a proactive market orientation refers to attempts to discover, understand and satisfy customers’ latent needs. Expressed needs may have either expressed or latent solutions.

[29] suggested that companies that apply proactive market orientation work more closely with their customers. Proactive market orientation can be accomplished by working closely with lead users or by conducting market experiments in order to discover future needs that are typically difficult to foresee or articulate [18, 34, 2, 33]. Given that certain customer needs are often difficult to identify or express [34], the present paper infers that collaboration in development projects is typically dependent on opportunities for interaction and communication.

Three terms are used to capture the more active role of consumers: proscription, co-production and co-creation [39, 41, 31, 32]. It has been argued that customers co-create for their own consumption [46]. The service-dominant logic [41] defines co-production and co-creation as phenomena that are connected to the production and delivery of a service; in other words, how firms deal with their customers through customer participation in the joint creation of service value [41]. [41] claim that regardless of the service offer’s degree of tangibility, “The customer is always a co-creator of value”.

Previous research has shown that it can be difficult to understand value-creation processes. It follows explicitly from the Service-Dominant Logic that value-creation processes are inherently subjective and must be understood in relation to each specific time and place [21]. In a similar fashion, scholars such as [43] have reached the same conclusion, explaining that customer value is “sticky information,” which is costly to transfer from place to place because it is tacit [5]. The implication is that a company knows more about its solution than it does about the customer’s needs for the same solution. Hence the company must communicate with customers in the development process in order to understand how the solution can be applied to satisfy the customer’s needs [30].

Furthermore, [6] described what they refer to as “absorptive capacity” as a major challenge for companies that are developing new offerings. Absorptive capacity is the company’s capacity to assimilate customer needs. [27] found that effective cooperation with all parts of a network (including customers) is essential in order to promote effective competition (i.e., an attractive offering). In line with this, [14] showed that frequent customer interaction leads to innovation success. Based on a literature review, [14] concluded that there is general agreement that intensive communication with customers is a determinant of new product success. They concluded that previous studies had provided a “limited insight into the interaction with customers.” Based on these reports, the present paper concludes that since value-creation processes are difficult to understand. Consequently, it is essential to collaborate with customers during the development process. Companies must also know more about customer interaction, i.e. the communication process involved in applying a collaborative process.

2.2 Customer collaboration as communication and interaction with customers

In the organizational communication literature, [25] have established specific dimensions that influence the quality or richness of the communication. [3] showed that the communication literature offers a novel and valuable opportunity to examine the quality of the communication in New Product Development (NPD), particularly with regard to need-related
information that, as already have been pointed out, can be difficult to transfer from a customer to a company. Based on the organizational communication literature, [25] and [3] analyzed marketing channel communication in terms of its frequency, direction, modality and content. The present article uses marketing channel communication as a framework for understanding how collaboration between a company and its customers during the development process results in a deeper understanding of users’ needs. The idea is that intense collaboration leads to better innovation, as depicted in our conceptual model as shown Figure 1.

![Figure 1 Conceptual model](image)

The four parameters result in an interactive communication climate that is more or less conducive to the learning, sharing and understanding of customer needs. It seems reasonable to expect that frequent and active communication is more likely to enable bidirectional trust and high quality information exchange about customers’ needs. Active communication enables customers and companies to meet and exchange information about needs that may otherwise be difficult to express or transfer. Therefore, collaboration with customers concerns the provision of qualitatively good opportunities for interaction and communication.

This conceptual framework uses the four above-mentioned parameters from communication theory in order to understand how companies interact to develop offerings that will later result in value-creation that is co-created by users. More precisely, this article defines customer collaboration as a communication process that is frequent, bidirectional and face-to-face in attempts at creative problem solving. Consequently, the paper considers passive collaboration to be less frequent, unidirectional, electronic and anonymous communication in which there is an uneven distribution of initiative and creativity and as a consequence is less beneficial for the NPD process.

2.3 Development of hypotheses

The hypotheses build on the framework presented in [25] and the four dimensions developed in this. Frequency refers to the amount of time for which communication occurs between the involved parties. In the context of customer collaboration, frequency refers to aspects such as the amount of on-going feedback between a company and its customers. It may also concern the number of mutual experiments or the amount of iteration that takes place with customers during the development of a specific version of the offering within a development project [7, 38]. Frequency can also refer to the extent to which a learning process about customers’ needs occurs and leads to the generation of new ideas in a development project [9, 24]. Given the framework in [25], it is reasonable to expect that a relationship with a higher frequency of collaboration will result in an increased likelihood of ‘new product success’ and ‘market share performance.’ Accordingly, the first hypothesis of this paper is:

**H1: Collaborative processes characterized by a high frequency will lead to increased new product success and increased market share performance.**

Direction refers to the democratic aspect of communication; namely the extent to which one party exerts power over the other(s). This could, for example, apply to such issues as whether both parties are equal in taking the initiative to interact and share approximately the same workload. With regard to customer collaboration, direction is expected to be important when it is difficult to estimate future customer usability [16, 26]. In other words, when it is difficult to foresee value-creation, there must be an even distribution of communication between parties in order to envision future customer needs [3]. In addition, when there is an even distribution of communication and interaction, both parties can be expected to contribute to the end result, which should lead to more novel ideas [42].

In sum, the present paper assumes that democratic dialogue results in processes that are beneficial for the outcome of development processes. Too often, companies take an overly dominating role, so the second hypothesis states that more evenly
distributed initiatives will lead to more beneficial outcomes of new product development.

**H2: A collaborative process characterized by direction, i.e. an evenly distributed two-way communication, is expected to influence new product success and market share performance.**

*Modality* refers to how information is transmitted. It may, for example, apply to cues such as whether the communication takes place face-to-face or whether it is possible to provide immediate feedback. It may also apply to the degree to which communication is focused on a specific recipient [12]. With regard to collaboration with customers, *modality* means the extent to which communication takes place face-to-face or otherwise (i.e., electronically) and the extent to which a customer receive opportunities to deal directly with critical aspects in a development project. This paper makes an implicit assumption that when communication takes place electronically, it typically addresses many recipients. Research confirms that group decision making is hampered in electronic communication as compared to face-to-face communication [16]. Also, if customers are excluded from any part of the development project, it is most likely the critical ones for which customer input might have the greatest impact. The third hypothesis predicts that collaborative processes, such as face-to-face communication and openness in critical aspects of a project, will facilitate the success of future products and services:

**H3: Collaborative processes characterized by high modality will lead to new product success and market share performance.**

*Content* refers to what is being transmitted during communication [25]. In the present paper’s context of collaboration between a company and its customers, content can pertain to whether the focus is on customer needs and difficulties related to value-creation. By way of comparison, customers may sometimes be invited to companies with the purpose of strengthening the relationship rather than to improve the outcome of the development processes. This paper focuses on whether companies make it possible for customers to share their inventiveness at the locations where their needs are most likely to be present in the future (i.e., without trying to determine them in a superficial laboratory, for example). The reason for this is related to the often documented difficulty of expressing needs [43, 28]. Latent needs are assumed to be more easily detected if a search is being conducted at the same time as the user experiences them [20]. Hypothesis 4, below, predicts that new offerings will be more successful if they account for needs that have been identified from use experiences [23]. In addition, if customer inventiveness is shared at the location where needs are present, then other resources that are typically used in combination with the potential solution that the company offers will increase the likelihood of fully understanding customer needs[5]. This, in turn, should lead to new product success and market share performance [21]. The fourth hypothesis is:

**H4: When collaborative work is focused on content related to context, it will be more beneficial in terms of new product success and market share performance.**

3. Method

3.1 Sample

A paper-based survey was sent to the product or service development managers of certain European firms that were selected from an externally purchased database. It was not possible to screen firms in advance to determine which firms had a development organization. Accordingly, managers were asked to participate only if their organization conducted development projects. If they for some reason could participate in the survey, either because they had no experience of NSD or that the person included in the sample no longer was with the company, they were asked to notify either the data collection company or the researchers. This was done by 16.4 percent of the respondents for the total sample. Reminders were sent to non-respondents one and two weeks after the initial mailing, which yielded a response rate of usable responses of 20.0 percent. Following the procedure recommended by [1], the tests indicated that there were no statistically significant differences between early and late respondents in terms of the survey data.

Usable responses were received from 334 firms. Complete data was obtained for manufacturing and service firms in industries such as the machine industry, pulp and paper, fabricated metal goods, machinery and equipment, renting and real estate, construction services, consumer services, and business services. All questions in the survey were asked at the project level, including those regarding activities and performance. The research issue in this manuscript investigates customer collaboration in projects that intended to accomplish *incremental innovations*. This important distinction resulted in the analysis of a sub-sample of 207 responses. The other projects either related to product improvement or radical innovations, in which the four dimensions of customer collaboration
behave differently. Further research is needed to understand customer collaboration in such projects.

3.2 Measures and descriptive statistics

The survey instrument was developed on the basis of previous questionnaires and with the help of consultants. Twenty items were used to operationalize the six latent constructs. Each item was scored on a 10-point scale that ranged from “completely disagree” to “completely agree” (except for a section containing background variables for categorizing the organization).

Item selection and generation for the four dimensions of customer collaboration was guided by theory. The scales that were used can be found in Appendix 1; included in the appendix are also mean values, standard deviations and loadings for each item. As Appendix I also shows, frequency and content were operationalized as a four-item construct, while direction and modality were operationalized as three-item constructs. Business performance was measured by a scale developed by [36, 37] that captured the market acceptance of the developed innovation. Specifically, market acceptance was measured by a three-item scale that assessed the market share of the new product relative to competitor’s products and the firm’s own products [36, 37].

3.3 Analysis

There are strong correlations between many of the communication practices that organizations use, which can obscure the relationships between practices and performance. Structural equation modeling is well suited to handle such situations [35]. The present study used the partial least squares (PLS) method, a causal modeling method that is particularly suited to operationalizing models such as that illustrated in Figure 1 [15]. PLS is an estimation procedure that integrates aspects of principal-components analysis with multiple regression [45]. The procedure essentially extracts the first principle component from each subset of measures for the various latent constructs and uses these principle components within a system of regression models. The algorithm then adjusts the principle-component weights to maximize the predictive power of the model.

All constructs were modeled using reflective indicators (in other words, the indicators are created based on the assumption that they all reflect the same underlying phenomenon [4]). Jackknife estimates were generated in order to evaluate the significance of the paths in the model [4]. Jackknifing generally involves deleting every nth case or observation, estimating the model parameters and repeating this sample-resample procedure in order to generate a set of standard errors for the model parameters [10]. Simple t-statistics are then computed to determine whether the parameters are different from zero. Following Tukey’s guidelines, five percent of the sample was removed during the re-sampling procedure, which resulted in 20 sub-samples per model.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Direction</th>
<th>Modality</th>
<th>Content</th>
<th>NP success</th>
<th>Market share</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.80</td>
<td>0.39</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.40</td>
<td>0.57</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.52</td>
<td>0.45</td>
<td>0.65</td>
<td>0.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.32</td>
<td>0.31</td>
<td>0.27</td>
<td>0.34</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>0.34</td>
<td>0.31</td>
<td>0.26</td>
<td>0.38</td>
<td>0.78</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Table 1 Assessment of the validity of the model (AVE)

To check the validity of the model, the Average Variance Extracted (AVE) is used [12]. The AVE measures the amount of variance that is captured by the constructs in relation to the amount of variance due to measurement error [11]. To ensure discriminate validity of the constructs, the AVEs of the latent variables should be greater than the square of the correlations among the latent variables [4]. In PLS, the correlation matrix of the latent constructs, where the diagonal elements are replaced by the square root of the computed AVEs, is used to make this comparison. Higher values for the diagonal elements compared to the off diagonal elements suggest good discriminate validity. As can be seen in Table 1 this is the case for the model, which ensures that the model show good discriminate validity.

Two control variables were introduced in the model; size of the business unit (1-4 scale, mean value= 3.19, std = 0.69) and experience of the respondent. Experience was measured by two variables; experience with NPD projects (mean=12.14 years, std = 8.23) and how long the respondent have been with the company (mean=13.46 years, std = 9.24). The result were equal or similar to those before the control variables were added.
4. Results

The proposed model was estimated using PLS across firms. The first step in assessing the measurement models involves testing the reliability of each measured variable to ensure that the measurement variables (MVs) accurately apply to their related constructs. Overall, the MV loadings were all relatively large and positive. As seen in the appendix; most of the loadings exceeded the recommended threshold value of 0.707 [17]. The research practice, however, is to keep the item in the analysis if the loading exceeds 0.5, as long as there is a good theoretical reason for doing so. In this case, the study built on established scales for market success, which made it appropriate to keep all measures in this scale. Figure 2 presents the results of the analysis. The model explains 61 percent of the variation in market success and 17 percent of the variation in product success. All but one of the paths are significant (using adjusted t-tests and p< 0.05). The significant path coefficients were 0.1500 for frequency, 0.1651 for direction and 0.205 for content. The non-significant path is modality.

![Figure 2 Conceptual model with results](image_url)

5. Discussion

This article viewed customer collaboration as a communication process that is frequent, bidirectional and face-to-face in attempts at creative problem solving. From such a perspective, communication and interaction becomes one of the most important aspects when co-creating with customers. A model from research on market channel communication was applied in order to understand the impact that different aspects of customer collaboration have on product and market success. The four different dimensions that originated from [25] and [3] were frequency, direction, modality and content.

Our results contributes with a deeper understanding into why new offerings developed through market research techniques based on collaboration with customers are more profitable than those developed with traditional market research techniques (see e.g. [44]). For NSD projects aimed at accomplishing incremental innovations, three dimensions of customer collaboration were more or less equally important for product and market success. The reason for the good results of collaboration with customers can be found in frequency, direction and content. This means that a company can improve the results of the development project by spending more time on communication with customers. This communication should be democratic, i.e. the communication should be between two parties of equal power and we should focus on specific types of content during communication. In addition, our results support that how the information between the customer and the company do not explain why collaboration with performs better than traditional market research techniques.

From a managerial perspective, this suggests that it is beneficial when working with incremental innovation to spend a lot of time with the customers or become immersed in the customer’s context as much as possible. The research also suggests that treating customers as more equal partners in the process is good for product and market success. The research also supports previous findings that information involving customer contexts or the transfer of sticky information is important in the development process. The results point towards the need for an increased understanding of the circumstances surrounding the customers’ value-creation processes. The study suggests that increased collaboration with customers is a key to successful development.

6. References


## Appendix I

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Loadings</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing feedback from customers</td>
<td>0.71</td>
<td>5.20</td>
<td>2.97</td>
</tr>
<tr>
<td>Many ideas were tested</td>
<td>0.80</td>
<td>5.18</td>
<td>2.70</td>
</tr>
<tr>
<td>Multiple experiments</td>
<td>0.83</td>
<td>4.99</td>
<td>2.88</td>
</tr>
<tr>
<td>Learning process of customer needs</td>
<td>0.86</td>
<td>4.42</td>
<td>2.60</td>
</tr>
</tbody>
</table>

### Direction

<table>
<thead>
<tr>
<th>Direction</th>
<th>Loadings</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication and interaction leading to novel ideas</td>
<td>0.82</td>
<td>4.92</td>
<td>2.61</td>
</tr>
<tr>
<td>To reduce lead time we have focused on collaboration</td>
<td>0.73</td>
<td>6.49</td>
<td>2.50</td>
</tr>
<tr>
<td>Open innovation system</td>
<td>0.61</td>
<td>2.40</td>
<td>1.91</td>
</tr>
</tbody>
</table>

### Modality

<table>
<thead>
<tr>
<th>Modality</th>
<th>Loadings</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>We solve critical aspects together with customers</td>
<td>0.82</td>
<td>4.43</td>
<td>2.76</td>
</tr>
<tr>
<td>A high degree of face-to-face communication</td>
<td>0.90</td>
<td>4.45</td>
<td>2.91</td>
</tr>
<tr>
<td>Customer suggest solutions to problems</td>
<td>0.78</td>
<td>5.17</td>
<td>2.88</td>
</tr>
</tbody>
</table>

### Content

<table>
<thead>
<tr>
<th>Content</th>
<th>Loadings</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active customer involvement</td>
<td>0.84</td>
<td>5.05</td>
<td>2.95</td>
</tr>
<tr>
<td>Customers were involved early in the development process</td>
<td>0.81</td>
<td>4.40</td>
<td>2.88</td>
</tr>
<tr>
<td>Inspired by customer settings to generate ideas</td>
<td>0.83</td>
<td>6.88</td>
<td>2.62</td>
</tr>
<tr>
<td>Used customer feedback</td>
<td>0.77</td>
<td>6.69</td>
<td>2.59</td>
</tr>
</tbody>
</table>

### New Product Success

<table>
<thead>
<tr>
<th>New Product Success</th>
<th>Loadings</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales volume</td>
<td>0.88</td>
<td>6.14</td>
<td>1.97</td>
</tr>
<tr>
<td>Overall profitability</td>
<td>0.88</td>
<td>6.22</td>
<td>1.94</td>
</tr>
<tr>
<td>Profitability compared to goal</td>
<td>0.89</td>
<td>6.33</td>
<td>2.09</td>
</tr>
</tbody>
</table>

### Market Share

<table>
<thead>
<tr>
<th>Market Share</th>
<th>Loadings</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market share compared to other own products</td>
<td>0.92</td>
<td>6.09</td>
<td>2.03</td>
</tr>
<tr>
<td>Market share compared to competitors</td>
<td>0.91</td>
<td>6.57</td>
<td>1.99</td>
</tr>
<tr>
<td>Market share compared to goals</td>
<td>0.68</td>
<td>6.38</td>
<td>2.75</td>
</tr>
</tbody>
</table>