Value Co-Creation in Data-Driven Services: Towards a Deeper Understanding of the Joint Sphere

Abstract

While the co-creation of value between provider and customer(s) is a common theme in service research, continued theoretical conceptualization is required to guide more effective design of services.

In order to advance understanding of value co-creation, we have conducted a pre-study consisting of 16 interviews in the application domain of data-driven services—services that support the decision-making process of customers through the provision of data and analytics. Adopting the theoretical lens of joint spheres, we present empirical evidence that the proportions of the joint sphere can vary with differences in interaction, access to customer processes or behaviors and decision power.

As a next step, we propose a final case study phase to further explore factors that influence the proportion of joint sphere and, thus, the provider’s real value creation. Understanding how real value creation is impacted by the resource integration of provider and customer(s) will ultimately enable the purposeful design of data-driven services for effective value co-creation.

Keywords: value co-creation, joint sphere, smart services, data-driven services

Introduction

In recent years, new ways to collect and transmit large volumes of data have emerged and advancements in computational power have created the ability to analyze them (Chen et al. 2012; Turner et al. 2014). This technology evolution enables a liquefaction of resources in which knowledge and its transfer is decoupled from physical objects and their movement (Lusch and Nambisan 2015). This creates resources (such as knowledge and information) that flow instantly and seamlessly among actors. As a result, these actors—for instance, a provider and its customer—can interact and engage with each other digitally (Lusch and
Nambisan 2015). Our understanding of such digital interaction and engagement is still unfolding and requires refinement of the very nature of value co-creation (Nenonen and Storbacka 2018).

The need for a more nuanced conceptualization of value co-creation becomes evident in the context of data-driven services, defined as the use of data and analytics by a provider to support a customer’s decision-making process with the intent to create value for the customer; the data and analytics can stand alone as an offering or be bundled with an existing product or service offering (Beverungen et al. 2019; Davenport 2013; Schüritz and Satzger 2016; Wixom and Ross 2017). This concept is not completely new: FedEx introduced data-driven services in the late 80’s when the company added package delivery tracking to their transportation services. FedEx customers used this tracking information—such as current shipment status and predicted delivery time—to better manage their shipments (Baldwin 2013). Since that time, myriad companies across a diverse range of industries have launched data-driven services that analyze data, guide users through insights, and/or even automatically act on behalf of the user. In financial services, banks developed financial spending dashboards and alerts to help customers manage their budgets and cash flow (e.g., Alfaro et al. 2018). Heavy equipment manufacturers developed algorithms that predict parts failure to help customers proactively maintain equipment and reduce operational downtime (e.g., Porter and Heppelmann 2015). In these data-driven services contexts, our existing understanding of value co-creation through actor-to-actor interaction (Grönroos and Voima 2013) is challenged because actors can be deeply integrated in other actor’s processes and because interactions can take place through automated algorithms (Storbacka et al. 2016).

Inspired by the proliferation of data-driven services and by the interesting new provider-customer relationships and interactions that they represent, we sought to explore the co-creation of value in data-driven services contexts. This research aims to contribute towards a more nuanced conceptualization of value co-creation and resource integration. Specifically, we investigate factors that influence the space in which providers and customers interact to co-create value, called the joint sphere (Grönroos and Voima 2013).

To do this, we conducted an initial research phase to examine the level of provider-customer integration across a diverse set of 36 data-driven services examples. We analyzed the examples and interviewed a subset of 16 executives of service providers associated with eight of those examples to refine our analysis. We learned that in data-driven services contexts, the proportions of the joint sphere are determined by interaction, access to customer processes and behaviors, and decision power. Only in the joint sphere can the provider purposefully integrate resources to affect real value creation—that is, the value a customer realizes in the use (value-in-use) of a service (Grönroos and Voima 2013). The final phase of our research will explore the co-creation of value more comprehensively by collecting data from all participating actors of a specific service system.

We first present a brief literature review of value co-creation and data-driven services. Next, we explain the study methodology and analysis to date. We illustrate our current thinking by conceptualizing the influencing factors of the joint sphere and real value creation—supported by examples from our application domain. The paper closes with a discussion of preliminary results and a description of our next steps.

Related Work

Value Co-Creation

The goods-dominant logic views products and services as outputs of a production process that are valuable as objects in existence. This value is consumed and destroyed by the user or customer. By contrast, service-dominant logic (S-D logic) considers the value of an offering as co-created through the application of the operand and operant resources of both provider and customer (Vargo and Lusch 2004). Ultimately, this means that value is not determined by the features of an offering but by the value perceived by the user (Vargo and Lusch 2004). The service-dominant view and the co-creation lens have found broad adoption, and authors have focused on a wide range of aspects of this view. This has included modifying the initial conceptualization (e.g., Chandler and Vargo 2011), adding new perspectives (e.g., Payne et al. 2008), looking into applications (e.g., Yan et al. 2010), and clarifying issues around the perception of co-creation.
as such (e.g., Vargo and Lusch 2016). Moreover, S-D logic serves as the foundation for service science (Spohrer and Maglio 2008; Vargo and Lusch 2016).

Many scholars agree that the initial S-D logic view on co-creation was too vague to sufficiently understand value creation between a service provider and a customer (e.g., Ballantyne et al. 2011; Grönroos and Voima 2013). Thus, Grönroos and Voima (2013) proposed that co-creation results from the interaction between providers and customers, and introduced the concept of provider, customer, and joint spheres (cf. Figure 1). This view specifies co-creation to be a joint process in which firms (or other actors) and customers together create value in interaction (Grönroos and Voima 2013). Before this joint creation of value, the provider acts independently and without customer involvement in the provider sphere. In the provider sphere, the provider facilitates value creation, that is, the provider creates potential value for a customer. The customer then (in the customer sphere) independently transforms potential value from the provider into value-in-use or real value (Gummesson 2007). Therefore, the only way the provider can directly influence real value is by interacting with the customer and co-creating value in the joint sphere. The joint sphere is defined as the locus where value co-creation in interaction takes place (Grönroos and Voima 2013).

![Figure 1. Value creation spheres, adapted from Grönroos and Voima (2013)](image)

The concept of value creation spheres was criticized by Vargo and Lusch (2016) as being incomprehensible and without valuable contribution for scholars and practitioners (Vargo and Lusch 2016). Specifically, they criticized the poor distinction between “facilitate” and “co-create” (Vargo and Lusch 2016). Both perspectives contribute intriguing and useful insights to the conversation and help us to understand how value is co-created between actors. While Vargo and Lusch (Lusch and Vargo 2014; Vargo and Lusch 2016) see the beneficiary of a service always as a co-creator of value, Grönroos and Voima (2013) add a more differentiated view by determining that co-creation only occurs if provider and beneficiary interact in the joint sphere.

**Data-Driven Services**

Information systems that gather, store, access, and analyze data to help business users make better decisions, commonly referred to as decision support systems, have been widely discussed in the IS literature (Chen et al. 2012; McAfee and Brynjolfsson 2012; Watson 2009). When building decision support systems to generate efficiencies, the literature usually distinguishes among three steps: data, insight, and action—sometimes referred to as the data value chain (Watson 2009; Wixom et al. 2013).

Beyond using data to achieve operational efficiencies for themselves, companies can also use their data to innovate service offerings and, thus, create meaningful value for customers. Practitioners and scholars alike have turned to integrating this notion into their frameworks, beliefs, and systems (Beverungen et al. 2019; Davenport 2013; Gottlieb and Rifai 2017). Because this research is still developing, many conceptualizations and terms are being proposed. Some academics (Allmendinger and Lombreglia 2005; Beverungen et al. 2019; Spohrer et al. 2018) use the term “smart services” to describe service offerings based on smart...
products; smart products have connections, sensors, actuators, and interfaces that enable the products to communicate and act. Schüritz et al. (2017) and Hunke et al. (2019) see the opportunity to utilize data and analytics in services as part of the approach to create a new value proposition for the customer. Regardless of different conceptualizations or terms, current research in this space consistently describes the use of data and analytics to support the decision-making process of the customer via data and analytics-based features and experiences in form of a stand-alone offering or bundled with an existing product or service; we refer to this phenomenon as data-driven services.

Methodology

To explore how companies use data and analytics to co-create value with customers, we adopted an exploratory qualitative approach that would help us learn about a new phenomenon, develop constructs and possible relationships, and generate explanations for our observations (Myers 1997).

<table>
<thead>
<tr>
<th>Service</th>
<th>Industry</th>
<th>Revenue</th>
<th>Product manager</th>
<th>Analytics counterpart</th>
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<td>✓</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Beta</td>
<td>Financial Services</td>
<td>&gt;15B USD</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
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</table>

First, we assembled a database of diverse data-driven services examples. We involved 86 executives who were responsible for the analytics strategy in large, multinational companies (e.g., Chief Data Officers, Chief Analytics Officers). Within the context of a closed online community—moderated by two members of the research team—we asked the executives to provide their “best example in which [their] organization provides customers with some form of data and/or analytics to increase the value of a product or service”. The community provided us with 36 examples of which 27 were data-driven services. The others represented traditional decision support systems applications that did not provide direct value to the customer. For the data-driven services examples, we identified differences in maturity and in the level of integration between provider and customer. We therefore choose to conduct interviews for select examples to better understand meaningful distinctions.

In order to purposefully select a subset of the 27 service examples, we established a set of selection criteria that would generate diverse perspectives (Patton 2002): we identified a set of data-driven services that were launched and in use by customers, represented a variety of industries, and represented both B2B- and B2C-relationships. Based on these criteria we selected eight examples, and conducted 16 semi-structured interviews of 30 to 60 minutes with the product manager of each service as well as their analytics counterpart—both interviewed about the same data-driven services example (cf. Table 1). The paired interviews provide complementary information as to the nature of the service, the service design and development, the evolution of the service, and the value creation for the customer. In two examples, the product manager was analytics-savvy enough to answer our questions independently, and in two examples, both a data and an analytics manager answered our set of technical questions.

All interviews were conducted via an online video conferencing tool, recorded (with consent), and transcribed. Researchers analyzed the data independently in several rounds of coding, using memoing and an open coding approach. We later applied axial coding to group the codes into categories (e.g., type of
interaction between provider and customer, resulting customer benefits, etc.), which we then further developed into common themes and concepts. Through continuous abstraction in small workshops among the researchers, we identified different manifestations of the joint spheres and extracted factors that we found to impact the joint sphere during value co-creation.

**Observations**

In our analysis of data-driven services examples, the joint sphere (Grönnroos and Voima 2013) helped to distinguish the provider alone creating potential value and the provider creating real value with the customer. By distinguishing the creation of potential value from the creation of real value, we could identify varying proportions of joint spheres in the data-driven services examples. We termed three primary varying proportions as no or limited joint sphere, developed joint sphere, and extensive joint sphere. We also identified properties of services that seemed associated with different proportions.

**Co-Creation in Data-Driven Services**

Data-driven services without any or with only a limited joint sphere provide data in raw or aggregated form to customers. The provider facilitates value creation by collecting as well as preprocessing data and by "delivering" the data via reports, dashboards, or APIs; the provider does not have direct understanding of how clients use the data, what insights they derive, or how the provided data influences their actions. Customers derive insights and take actions themselves—as our example from Beta illustrates: A bank provides its institutional customers with an API to allow them to access their financial transactions and to download the transactions into internal processes if and how the customers choose. A limited joint sphere may exist if customers give the provider adoption requirements, such as technical file requirements or fields to include; this happened in the Beta example as an API was customized for top customers.

We identified another category of data-driven services through which providers deliver insights to customers. The insights manifest as the provision of alerts, identification of aberrational activities, comparisons against benchmarks, or proposals of next steps. In these cases, the joint sphere includes more provider-customer activity; for example, the customer supplies the provider with data and information to incorporate into services; customers also provide the provider with requirements regarding their intended independent value creation. The services, however, still depend on the customer action to turn insights into real value: for instance, in our data-driven services examples, the professional service firm Alpha offers financial auditing for its business customers and uses investigative and trend analytics to make the process more efficient, and customers provide access to data as part of the audit process. Using the engagement data and engagement insights, Alpha developed data-driven services in the form of scores that reflect fraudulent or corrupt practices and transactions. Although the scores could impact real value creation if acted upon; the customer creates real value independently only if corrective actions are put in place post-engagement.

Finally, we observed an extensive joint sphere in some of our examples. In these cases, providers directly acted with or on behalf of the customer in ways that generated real value, e.g., in performing predictive maintenance to avoid unplanned machine downtime. The action manifested as manual interventions or automated processes. For example, in our example at Epsilon, hearing aid users grant access to behavioral data and give the provider permission to control device settings. The provider then automatically adjusts the hearing aid settings using algorithms that optimize hearing based on a noise context while the customer is wearing the device. In these cases, the provider and customer processes and practices are deeply interwoven, and there is a large joint sphere in which the provider participates substantially and regularly in real value creation and can ensure that real value is created.

Table 2 illustrates a continuous spectrum (rather than distinct categories) of possible joint sphere constellations. The table provides actions in the provider sphere for value facilitation, actions in the joint sphere for real value creation, and actions in the customer sphere for independent real value creation. We include supporting quotes regarding joint sphere activities for each spectrum.
Towards Re-Conceptualizing the Joint Sphere for Value Co-Creation

Our analysis of data-driven services leads us to a re-conceptualization of the joint sphere. We consider the joint sphere to include the range in which the provider directly affects real value creation by integrating resources with the customer. Our analysis identified three factors that may impact the proportion of the joint sphere: interaction, access to customer processes and behaviors, and decision power (cf. Figure 2):

1. **Interaction** is defined by “physical, virtual, or mental contact, such that the provider creates opportunities to engage with its customers’ experiences and practices and thereby influences their flow and outcomes” (Grönroos and Voima 2013, p. 140). In data-driven services, interaction includes contacts like data exchange, requirements elicitation, automated actions, etc. More interactions — and two-way interactions - provide opportunities for more and deeper understanding of customer needs and meaningful services.

2. **Access to customer processes or behaviors** represents how and when a provider can integrate into the daily activities of the customer. Increased access to customer processes and/or behaviors increases a provider’s context knowledge of customer motivations, problems and latent needs. In addition, access can better position a provider to influence or perform customer processes and behaviors in a beneficial way, thus ensuring real value creation.

3. In this services context, we define **decision power** as the extent to which one actor can make decisions regarding the decision-making process of another actor. Traditionally, the customer controls real value creation and retains full decision power regarding services. Our analysis revealed examples in which the provider has some decision power and thus can directly affect real value creation through action-based data-driven services.
We believe the joint sphere can be enlarged through some combination of interaction, access and/or decision power. To maximize the joint sphere, we believe that all three factors need to be fully developed. Figure 2 gives an overview of the relationship between the joint sphere, the factors influencing its proportion, and potential and real value creation (via resource integration).

**Discussion**

Using data and analytics to inform decision making has long been an area of interest for academia and industry alike. Enriching product and service portfolios by helping customers make decisions has recently become an interesting strategy by companies and is now being actively explored by academics. When actors co-create value using data-driven services, the data value chain is shared between a provider and a beneficiary. The design of the service defines what activities are conducted by which actor, such as collection of data, preprocessing of data, the application of analytics on this data to derive insights, and even decision making and resultant action. Depending on the nature of the interaction, the access to customer processes or behaviors, and the decision power, the data value chain may be shared in a way that creates a larger joint sphere. Ultimately, the way the data value chain is shared has a tremendous impact on value creation. If the nature of sharing increases the joint sphere, then the provider can participate in more real value creation.

For some time, there has been a call for a refinement of how actors contribute resources to create value (Lusch and Nambisan 2015; Nenonen and Storbacka 2018). We see value in a more nuanced view of co-creation of value by taking the perspective that the provider facilitates value in the provider sphere and only creates real value in the joint sphere. In our data, this distinction was important, and we argue that the joint sphere determines whether resources that are integrated by the provider are used purposefully to ensure that potential value is realized and transformed into real value. *Interaction* initially defined the size of the joint sphere (Grönroos and Voima 2013). This conceptualization, however, does not include the impact of access to customer processes and behaviors and the impact of decision power. We believe a deeper understanding of the joint sphere includes three factors that influence the joint sphere proportion.

**Future Research**

Our research at this point has a strong dyadic customer and service provider perspective because it does not consider other actors. Further, our research to date only included data collected from providers.

To further advance this research on value co-creation using data-driven services, we want to shift to a more comprehensive perspective and collect data from all participating actors in data-driven services setting, including customers. We intend to perform a series of case studies of companies that have data-driven services with varying proportions of joint spheres. We intend to collect data from 2-3 different companies in two different industries, and we would like one industry to reflect a B2B business types and the other to reflect B2C.
Within each case study we will review artifacts that that help us understand the service design and value creation process (e.g. websites and presentation material). We will interview representatives of the provider including product managers, service managers and executives, and technical experts. In addition, we will interview multiple representatives of the customer. In a B2B context this will include the department that is benefiting from the service as well as departments that are concerned with service integration. In a B2C context this will include end users. For a comprehensive treatment of the context, we also plan to include other actors that participate in the value creation process, such as IT service providers, partners and platforms (Yin 2013). Data will be analyzed using qualitative methods.

The case study phase results will help us refine the concepts presented earlier in Table 2. Prior to ICIS 2019, we will identify case sites and set up researcher visits, draft the case study interview questions, and collect and review publicly-available artifacts in preparation for the visits. We intend to begin interview visits after we receive and incorporate feedback during the ICIS conference.

**Conclusion**

Through the analysis of examples and interviews in the domain of data-driven services, we identified three factors influencing the provider and customer joint sphere of value co-creation: interaction, access to customer processes or behaviors, and decision power. We suggest that the proportion of the joint sphere determines the purposeful integration of resources, which enables the provider to influence real value creation with the customer using data-driven services. While our data collection limits our findings to the domain of data-driven services, we believe that they are applicable for value co-creation in general.

For academics, we believe that this more nuanced conceptualization of value creation and the joint sphere sheds new light on our understanding of value co-creation and the service logic. Adopting and manifesting this more nuanced conceptualization of value co-creation enables academics to investigate value co-creation in a digital era in which interaction take place via digital interfaces or devices and decisions are enacted using algorithms.

For practitioners, our findings inform service design by proposing factors beyond interaction that can directly affect real value creation in data-driven services. By further developing our findings, we hope to equip managers with a better understanding of how to influence real value creation for customers in more and different ways.

**References**


