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# Value co-creation between firms and customers: The role of big data-based cooperative assets

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ABSTRACT

To better understand how big data interconnects firms and customers in promoting value co-creation, we propose a theoretical framework of big data-based cooperative assets based on evidence of multiple case studies. We identify four types of big data resources and four types of associated digital platforms, and we explore how firms develop the cooperative assets by transforming big data resources via the theoretical lens of service-dominant logic. This study offers a new theoretical perspective on value co-creation and an alternative competitive strategy in the era of big data for firms.


## 1. Introduction

Value creation in the digital age has become value co-creation between firms and customers [1], and the emergence of big data has been the primary driver for this disruptive change [2,3]. On the one hand, big data has revolutionized all aspects of customer lives, which allows firms to uncover unforeseen patterns about customers, businesses, and markets [4]. On the other hand, big data offers the firms opportunities to track customer behavior and measure outcomes of competitive strategies, which demand significant organizational changes [5,6].

Of the current data volume worldwide, 90% had been generated in the last 2 years [7]. In addition, customers generate a large amount of data nowadays [6]. In the era of big data, every change in customer behavior, location, or even physiological data can be recorded and analyzed [8]. Big data has provided both significant challenges and unprecedented opportunities for firms [9]. On the one hand, the 3-V (volume, velocity, variety) features present significant challenges for data analysis [10–12]. On the other hand, the 2-V features (veracity and value) provide the potential value for firms to make better business decisions [10]. However, in practice, accurate and effective applications of big data generated by customers remain a major problem [13]. Current big data research divides data into structured and unstructured types [10,14,15]. However, business decision-making is often the result of trade-offs between costs and benefits. The traditional data classification based on structure is unable to provide the needed value reference, and it is difficult to provide practitioners guidance about how a specific type of big data resources relates to a particular type of business value. Thus, a new classification of big data based on business value is required for better business decision making.

Service-dominant (S-D) logic suggests that value is co-created by firms and customers [1,16]. Many studies focus on the conditions required for successful value co-creation [17,18] and the benefits from the co-creation [19,20]. Recent literature has started to acknowledge intangible (indirect) as well as tangible (direct) values. However, there is still a lack of clarity about different dimensions of value for both firms and customers in value co-creation. In the value literature, asset is an important concept used to describe value. Customer equity, a core concept in research from the asset perspective, is defined as the sum of the discounted expected cash flow of a firm's current and potential customers [21,22]. However, this concept of asset frequently adopts a goods-dominant (G-D) logic and views customers as passive assets. Extant customer equity studies emphasize the direct economic value created from customer purchasing behavior and the direct economic expectation derived from the total number of customers [23].

We argue that it is necessary to advance an asset-based concept to highlight the characteristics of value derived from the cooperation between firms and customers. In the current literature, although value co-creation is a cooperative phenomenon, research tends to focus on the benefits each actor receives

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without considering the shared benefits between firms and customers at the same time. There is no theoretical concept in the literature that describes the shared benefits created by the cooperative behavior. We combine the concept of asset with S-D logic to propose a new concept—cooperative assets—defined as a type of asset with probable current or future economic benefits that can be acquired or controlled by the cooperative actors through service exchange. This study suggests that if firms and customers want to accomplish value co-creation, they must become cooperative assets to the other party. This study describes the specific transformation process of cooperative assets and identifies three characteristics of the cooperative assets that differ from the traditional assets: interactive, integrative, and bilateral. The bilateral characteristic is rooted in the nature of "cooperation" and "co-creation," which makes cooperative assets a unique category in the value co-creation scenarios.

Cooperative assets may be created from various ways, e.g., relation-based cooperative assets. In this study, we focus on the cooperative assets created from big data, and we argue that cooperative assets relate to big data in the following aspects. First, the resource basis of cooperative assets consists of two parts: customer-generated big data resources and firm-provided big data platforms. Using an exploratory case study approach, we identify four types of big data resources and four corresponding big data platforms. Second, based on the new data and platform classification, we propose four types of cooperative assets. This work essentially links resources (big data resources) to assets (concrete value) and enhances understanding of the value of big data in value co-creation. The current market competition is increasingly becoming data competition, and businesses are relying on technology to compete [24]. A clear understanding of how big data transforms from resources to valuable cooperative assets will have a profound impact on contemporary competition.

Goes [24] suggests that open and interdisciplinary academic research is helpful in understanding the value of big data. By connecting big data to S-D logic, this study proposes a theoretical framework of cooperative assets, which extends extant research in at least three ways. First, we identify four types of big data resources from different customer roles and identify the benefits firms can acquire from those resources. This provides a new big data classification that could guide practitioners to link particular data resources with a corresponding economic value. Second, both "value" and "co-creation" are metaphorical in construction [25]. This study provides a more specific description of value co-created by the actors and reduces the abstraction and ambiguity in understanding value. This study explains the bilateral benefits obtained by firms and customers through cooperation, demonstrates the process of co-creation, and interprets the consequences of co-creation. Third, although the potential benefits of big data are real and significant [2], and big data has been recognized as a new form of capital [26], few academic studies provide a consolidated framework to explain how big data becomes assets that generate value to the actors in value co-creation. This study interconnects big data and S-D logic, and illustrates the process of big data transformation from resources to assets.

The rest of this paper is structured as follows. We first describe the theoretical foundation of this study and present a gap analysis in Section 2. We then present our research methods and a detailed explication of data collection and analysis in Section 3. In Section 4, we describe a comprehensive process of big data transformation from resources to assets. We explicate four types of cooperative assets that provide bilateral benefits. In Section 5, we discuss the characteristics of cooperative assets and propose a theoretical framework, as well as the study's theoretical and practical implications, limitations, and ideas for future research. Finally, we summarize the main findings of this study in Section 6.

## 2. Theoretical background

### 2.1. Service-dominant logic and value co-creation

S-D logic is one of the most important theories that explain value co-creation between firms and customers [16,27]. S-D logic defines "service" as the application of specialized competences for the benefit of another actor or the self [27,28]. Distinct from G-D logic, S-D logic emphasizes that service is the fundamental component of economic exchange [27]. Goods are only distribution mechanisms for service provision, not a unique expression of value [16]. Firms are described as contributors, not simply product providers, to help customers accomplish one or more jobs (i.e., achieve a goal, resolve a problem, or satisfy demand) [1,29,30].

Another contribution of S-D logic is that it challenges traditional value creation logic, which implies that value is transferred from firms to customers. S-D logic clarifies that value is customer centric and co-created by both firms and customers [1,28]. Value co-creation research defines co-creation as joint actions by a customer and a service provider through direct interactions [25]. Recent value co-creation studies by marketing scholars focus on exploring the processes of value co-creation between firms and customers [28,31,32] in which *role changes*, *resource integration*, and *value identification* remain key focal discussion points.

#### 2.1.1. Role changes

S-D logic repositions the role of firms and customers within the value co-creation context, which is a shared worldview among value co-creation researchers. Firms are viewed as service providers [16,27], and resource integration is considered fundamental for service provision in S-D logic [1,33,34]. Specifically, firms integrate two types of resources to accomplish service provision: tangible resources, such as physical resources, human resources, partners, and customer resources [25,32], and intangible resources, such as knowledge and skills of the actors in value-creating networks [16,27]. Building digital platforms is an important way for the integration of resources by firms [35]. Therefore, we use "platform provider" to summarize the role of firms as the service provider in value co-creation with customers in big data environment.

In the S-D logic literature, customers are viewed as "operant resources," that is, they are capable of integrating skills and knowledge into co-creation processes [16,27]. Lusch and Nambisan [34] identify three broad roles of customers depending on the nature of service exchange and the type of resource integration achieved: ideator, designer, and intermediary. According to Lusch and Nambisan [34] (2015, pp.168), "The role of *ideator* reflects customer capability to bring knowledge concerning their needs and unique work to the firm context and to integrate it with knowledge concerning their use of existing market offerings to envision new services. The role of *designer* reflects customer capability to mix and match existing knowledge components or resources to configure or develop new services. The *intermediary* role reflects customer capability to cross-pollinate knowledge across multiple ecosystems and serve as intermediaries in service innovation. In this role, customers help make non-obvious connections across ecosystems in ways that provide value for themselves and others."

Previous studies have explained how firms participate in value co-creation and how their value is created [1,36]. By contrast, the same questions from the customer perspective are not adequately addressed. A conjecture is that prior studies assume customers are "service beneficiaries," which eliminates the relevance of explaining the customers' role in value co-creation. Lusch and Nambisan [34] argue that the value an actor creates or co-creates may not be