Value Cocreation and Service Systems (Re)Formation: A Service Ecosystems View

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This article explores a service-dominant (S-D) logic, service-ecosystems approach to studying value cocreation and the (re)formation of service systems. We outline the central premises of S-D logic and elaborate the concept of a service ecosystem to propose a framework that focuses on resource integration as a central means for connecting people and technology within and among service systems. This ecosystems view emphasizes the social factors that influence, and are influenced by, service-for-service exchange. We draw on systems theory and a structurational model of technology to underscore the importance of networks of actors, as well as institutions—e.g., rules, social norms—as critical components of service systems. We argue that this service-ecosystems framework provides a robust and dynamic approach for studying resource integration, value cocreation, and the (re)formation of service systems, and provides important insights for systematically innovating service.

Key words: theory and principles; transformation and innovation; value cocreation; service-dominant logic; resource integration

Introduction

Service science is centered on the study of value cocreation within and among service systems—dynamic and adaptive webs of exchange composed of interactions among people, organizations, and technology (Spohrer et al. 2007). Recently, Maglio et al. (2010, p. 1) elaborated that service science is the "systematic search for principles and approaches that can help understand and improve all kinds of value cocreation." Service-dominant (S-D) logic, and its definition of *service* as the application of resources for the benefit of another, centers on the concept of value cocreation (Vargo and Lusch 2004a, 2008). Its service-for-service exchange perspective was recognized early on as providing a critical theoretical foundation for the development of service science and the study of service systems (Maglio and Spohrer 2008).

More recently, S-D logic has progressed beyond the nascent perspective and framework stage, and the associated literature has evolved since its introduction in 2004 (Vargo and Lusch 2004a). Since then, the original foundational premises (FPs) have been revised, elaborated, and extended (see Vargo and Lusch 2008). This development has led to Vargo and Lusch's (2011a, b) introduction of a service-ecosystems perspective, which is based on S-D logic. We argue that this "ecosystems" view can provide a framework for studying *systems of service systems*—or the interaction and value cocreation among multiple service systems (Vargo et al. 2010). *Service ecosystems* are defined as "relatively self-contained self-adjusting systems of resource-integrating actors connected by shared institutional logics and mutual value creation through service exchange" (Vargo and Lusch 2011b). In addition to the emphasis on service as the basis of exchange and value creation, this view explicates the complex and dynamic nature of the social systems through which service is provided, resources are integrated, and value is cocreated. Furthermore, an ecosystems view emphasizes the importance of *institutions*—social norms or "rules of the game" (Williamson 2000)—in value cocreation, as well as service innovation. The aim of this paper is to explore how advancements in S-D logic, especially its ecosystems view, can contribute further to the ongoing development of service science.

To this end, we propose an S-D logic, ecosystems approach to studying service systems, and we elaborate on how it provides a lens for understanding value cocreation and systems (re)formation. This view centers on resource integration as the central means for connecting people and technology within and among service systems and emphasizes the social factors that influence, and are influenced by, service exchange. In particular, in this ecosystems view, the emphasis on the role of institutions in value cocreation requires the reconsideration of the scope of value cocreation and how it influences the actions and interactions of individual actors. This view,

in turn, draws attention toward the importance of resource-integration practices (Akaka and Chandler 2010, Vargo and Lusch 2011b) and structuration processes (Giddens 1984), which continually reproduce service systems. It also implies that institutions (i.e., social norms), as well as the resource-integrating practices (i.e., routine actions) that they comprise both influence and are influenced by value cocreation and systems (re)formation. Importantly, as we will discuss in more detail, by considering the importance of resource integration in value cocreation, we can take a more systemic approach to studying how value is cocreated within and among service systems.

This paper begins with an overview of the central premises of S-D logic and how they provide a theoretical foundation for studying service science and contribute to the conceptualization of service systems. Next, we discuss how an S-D logic, ecosystems view can provide a broader perspective for conceptualizing value cocreation and systems (re)formation. Drawing on prior research on practices in exchange and value creation, we propose resource integration as a central practice to value cocreation in service systems. Then, we discuss how service systems are continually reproduced through the enactment of resource-integration practices and a process called structuration (Giddens 1984, Orlikowski 1992). Finally, we conclude with a discussion of how an S-D logic, service ecosystems view on value cocreation contributes to furthering the development of service science and the study of service systems.

An S-D Logic, Ecosystems Approach for Service Systems

As noted, S-D logic has been recognized as an important theoretical framework for the development of service science and the study of service systems (Maglio and Spohrer 2008, Vargo et al. 2010). Furthermore, it has been suggested that an S-D logic–grounded service science can potentially provide a more comprehensive and inclusive approach than traditional theories related to service and exchange (Vargo et al. 2010). This is because, unlike traditional views of *services* as intangible units of output, S-D logic views *service*—the application of competences for the benefit of another—as the basis of *all* exchange. Thus, an S-D logic approach to service systems encompasses the exchange of both tangible and intangible resources, and it emphasizes the processes, rather than the output, of value creation.

The S-D logic, service-(eco)systems view aligns well with various theories on systems (e.g., see Barile and Polese 2010, Ng et al. 2011) and provides a conceptual foundation for the consideration of a service system as a "network of agents and interactions that integrate resources for value co-creation" (Ng et al. 2012, p. 1). This is because, as with other systems thinking, S-D logic and its ecosystems view considers service systems to be emergent, dynamic networks of actors and their interactions. Moreover, in line with recent work that suggests that multiple stakeholders (e.g., firms, customers, government entities) constitute complex economic systems (Ostrom 2010), S-D logic considers all social and economic actors as resource integrators and active participants of value cocreation. However, in addition to a view of dynamic networks of actors and actions, a service ecosystems view also strongly emphasizes institutions, or social norms (Williamson 2000), as a central driver of the actions and interactions that enable value cocreation as well as service systems (re)formation (Vargo and Lusch 2011a, b).

Along similar lines, Spohrer and Maglio (2010, p. 159) emphasize the importance of socially constructed meaning in service systems and highlight the way in which "symbols guide both internal behavior and mediate interactions with other entities." In particular, the authors suggest that symbols are a central component of service systems, and that "*symbol manipulation is increasingly important as a mechanism for value cocreation*" (p. 159, italics in original). In other words, processes of value cocreation draw on the abilities of individual actors in the "manipulation" or reinterpretation of various symbols and development new meanings, and thereby new ways of creating value. This view on value creation is reflected in S-D logic's original FP that *the customer is always the cocreator of value* (FP 6) and the more recently added premise that *value is always uniquely and phenomenologically derived* (FP 10) (Vargo and Lusch 2004a, 2008). To further the understanding of how socially constructed norms and meanings mediate value cocreation, we draw on the fundamental premises of S-D logic in the following sections and later elaborate and extend its ecosystems view.

In general, S-D logic posits that (1) service is the basis of exchange, (2) value is always cocreated, (3) all social and economic actors are resource integrators, and (4) value is always phenomenologically determined by a service beneficiary. As discussed, Vargo and Lusch (2011a) recently extended their views on service-for-service exchange by elaborating the concept of a service ecosystem, which emphasizes the dynamic and systemic nature of value cocreation and the influence of social factors in service-for-service exchange. S-D logic's central premises are discussed below as they relate to the development of service science (for a detailed discussion, see Vargo and Akaka 2009, Vargo et al. 2010) and the conceptualization of a service system (e.g., Barile and Polese 2010, Ng et al. 2011, Spohrer et al. 2007).

Service Is the Basis of Exchange

S-D logic's definition of service, and the premise that service is the basis of exchange, is fundamental for the study of service science. This is because an S-D logic conceptualization of service is a key factor in establishing the scope and relevance of service science to include all phenomena involved in value (co)creation through service provision. Without the inclusive conceptualization of "*service*" provided by S-D logic, "*services*" are treated as relatively inferior derivatives of goods (Vargo and Lusch 2004b) and, thus, service science is forced to become a science of the exception (to goods), or somewhat inferior products (Vargo et al. 2010). Thus, we argue that S-D logic and its definition of service *increases the scope and relevance of service science*.

S-D logic's conceptualization of service is important for understanding service systems because it "highlights the centrality of continuous interactions among actors, to the concepts of reticular relationships, to value cocreation and, finally, to the comprehension and functioning of service systems" (Barile and Polese 2010, p. 27). Barile and Polese (2010) elaborate the systemic nature of service systems by drawing on a viable systems approach, which focuses on the viability of socioeconomic relationships, or the system as a whole. The viability of a system is a critical factor in an S-D logic view of value cocreation, because, in this view, value is measured by a system's ability to survive and thrive in its surrounding environment (Vargo et al. 2008). In this way, service systems emerge and are maintained through continuous efforts of individual actors to create value for themselves, and for others, and the value of each interaction is measured at an individual level as well as broader (e.g., meso or macro) systems levels.

Value Is Always Cocreated

As mentioned, the concept of value cocreation is central to the study of service science and service systems (Maglio et al. 2010). Thus, S-D logic's premise that value is always cocreated in exchange provides an appropriate theoretical framework for research in service science. The concept of value cocreation articulates the idea that value is created through interaction and mutually beneficial relationships, within and among service systems, as they integrate and apply resources for and with each other and exchange service for service.

Within S-D logic, each service system engages in exchange with other service systems (provides for and benefits from service) to better its own circumstances through the betterment of the circumstances of others. However, value cocreation is not confined to the activities or resources of any individual encounter. Rather, value is cocreated through the integration of existing knowledge, the development of new knowledge (and other resources), and is influenced by the context, or environment, as well as the resources of others. This view falls in line with a complex economic systems approach (Ostrom 2010), which suggests that value is cocreated not only among firms and customers but also across a variety of social organizations, particularly government entities. Because of this, value cocreation involves more than the actions and resources of a given pair of service systems, and the creation of value depends on the availability of resources as well as the relationships associated with each service system (Akaka et al. 2012).

All Social and Economic Actors Are Resource Integrators

The integration of resources is a central component to value cocreation in S-D logic (Vargo and Lusch 2010). By recognizing all social and economic actors as resource integrators, S-D logic removes the labels of "producer" and "consumer" and argues for an "actor-to-actor" approach for studying exchange and value cocreation (see Vargo and Lusch 2011a). Importantly, resources have been considered as a critical component of value cocreation in service systems as well. Maglio and Spohrer (2008) identify four categories of resources in service systems: (1) resources with rights, (2) resources as property, (3) physical entities, and (4) socially constructed resources. According to the Maglio and Spohrer (2008, p. 19), it is the integration and exchange of these resources that drives the sharing of information, work, risk, and goods.

The combination of resources proposed in service science (e.g., Maglio and Spohrer 2008) falls in line with the different types of resources discussed within S-D logic. Vargo and Lusch (2004a, 2008) argue that service often involves the application of both operant and operand resources, but *operant resources*—those that are capable of acting on other resources to provide benefit—are the underlying driver of exchange and value cocreation. In other words, S-D logic argues for the primacy of operant resources (e.g., knowledge and skills) over *operand resources*—those that require action taken upon them to be useful (e.g., goods and money).

This view on the primacy of operant resources is important for studying service systems because it points toward the critical role of social resources (e.g., institutions and symbols)—a category of resources that appears to be understudied, but is gaining attention in the literature regarding service systems (e.g., Spohrer and Maglio 2010). In addition, S-D logic's consideration of all social and economic actors as resource integrators complements other views on complex economic systems (Ostrom 2010), as well as service systems (Spohrer et al. 2008),

because it suggests that customers, employees, and other stakeholders (e.g., government entities) are actually operant resources (those capable of contributing or influencing) for value creation.

Value Is Always Uniquely and Phenomenologically Determined by the Beneficiary

S-D logic's emphasis on customers as contributors to the value-creation process emphasizes the idea that value is uniquely and phenomenologically derived and determined through the application (use) of a market offering, and it is based on a particular perspective (individual viewpoint) and a specific context (e.g., time, place, and social setting). To better articulate the idea that value is cocreated in a particular context, the term *value-in-context* was introduced in the value cocreation and service science literature (Vargo et al. 2008). In their discussion of value and value cocreation in service systems, Vargo et al. (2008, p. 149) argue that value is always determined through the use of a particular resource in a particular context; they provide a definition of value as "improvement in system well-being" and argue that value can be measured in terms of "a system's adaptiveness or ability to fit in its environment" (i.e., context).

Recent advances in S-D logic and the development of the concept of a service ecosystem contribute to the understanding of how value is cocreated and relationships are developed and maintained in service systems (Vargo and Akaka 2009, Vargo and Lusch 2011a). Vargo and Lusch (2011b) have elaborated the concept of value-in-context from an ecosystems view and consider value as "an increase in the viability (survivability, well-being) of the system." This view of value-in-context is similar to a viable systems approach to conceptualizing service systems, which centers on actors' efforts to find "viable interacting conditions" (Barile and Polese 2010) or establish and sustain mutually beneficial relationships. In this (eco)systems view, value is not limited to the evaluation of an individual person but is based on the ability for a particular actor, or service system, to adapt and thrive in its (social) environment. Furthermore, an actor or service system can be a person, an organization, or even a nation. In this way, a service systems view on value is largely contextual and based on various perspectives within an ecosystem (Chandler and Vargo 2011). These viewpoints can vary among micro, meso, and macro levels, and thus, understanding the main processes by which value is created and the central resources actors draw on to cocreate value-in-context becomes critical.

Value Cocreation Through Resource Integration

The concept of a service system has been developed through the work connecting S-D logic and service science (Vargo and Akaka 2009). However, recent developments connecting S-D logic and service systems to various systems theories provide important insights into how value is cocreated within service systems. In particular, a systems view on service exchange has been elaborated through the integration of S-D logic and systems thinking (e.g., Barile and Polese 2010, Ng et al. 2011, Rouse and Basole 2010). In general, a systems approach to understanding service-for-service exchange draws attention toward multiple stakeholders (Ostrom 2010) and the importance of systems viability (Barile and Polese 2010) in value cocreation, as well as the emergent nature of service systems themselves (Ng et al. 2011).

Although the connection between systems theories and service systems has been made, S-D logic's ecosystems view (Vargo and Lusch 2011) extends the understanding of service systems by drawing attention toward the motivation for interaction and exchange. S-D logic aligns closely with a systems view of service systems because it centers on dynamic interactions among multiple stakeholders. However, S-D logic suggests that the reason various stakeholders interact is to exchange resources with the goal of creating value for themselves and for others (i.e., through service provision). In general, a service-ecosystems approach centers on the study of value cocreation through the integration of resources among multiple actors and service-for-service exchanges. What further distinguishes an ecosystems view of service systems is that S-D logic also emphasizes how social contexts (i.e., institutions) (Chandler and Vargo 2011, Edvardsson et al. 2011) influence, and are influenced by, value cocreation processes within and among systems of service exchange.

S-D logic's premise that service is the basis of all exchange emphasizes the role of the service beneficiary in value creation. Importantly, S-D logic considers all social and economic actors as resource integrators, which are capable of contributing to value creation. Within this mind-set, service providers make value propositions and service beneficiaries are always cocreators of value because they ultimately determine the value of a firm's offering through use and, in a particular, context. It is noteworthy that the ecosystems view also explicates the idea that the creation of value is dependent on social contexts—interconnected relationships (Chandler and Vargo 2011) as well as social structures—rules, and resources (Edvardsson et al. 2011, Giddens 1984). However, the relationship between value cocreation and social contexts is recursive, because, as actors engage in exchange, they draw on and contribute to the formation of relationships (Akaka and Chandler 2010) as well as social norms guiding those exchanges (Edvardsson et al. 2011).

Most recently, Vargo and Lusch (2011a, b) have suggested that value cocreation within service ecosystems is driven by the integration of resources, particularly shared institutions—common rules or norms for the governance of interaction. Importantly, S-D logic's emphasis on the integration of operant resources points toward institutions as a primary resource in value cocreation. Because institutions are capable of influencing and guiding action, they can be considered as operant resources. More importantly, because they guide social interactions, institutions can be considered as a *necessary resource* for value cocreation to occur.

Resource Integration as a Central Practice for Value Cocreation

These interactions and their governance have also been the focus of the study of "practices." According to Schatzki (1996, p. 11), "[Practices are] the central social phenomenon by reference to which all other social entities such as actions, institutions, and structures are to be understood." They are considered foundational to understanding all social activity because they are "recurring and often regularized features of everyday life" (Lofland et al. 2006, p. 123). Thus, to better understand social activity (e.g., value cocreation) in service systems, a discussion of *practices* is needed as it relates to value cocreation and systems of service exchange.

The relationship between practices and exchange systems has been discussed by Kjellberg and Helgesson (2007) and their recognition of three broad categories of market practice: (1) exchange practices, (2) normalizing practices, and (3) representational practices. *Exchange practices* are those involved in economic exchange, *normalizing practices* are those that contribute to establishing rules or social norms, and *representational practices* are those that depict what a market is and how it works. These practices are not mutually exclusive and are largely overlapping. They are considered to be "bundles of practices including material arrangements that contribute to perform markets" (Araujo et al. 2008, p. 8). In other words, according to this view, markets are continually "performed" through the enactment of multiple practices. This suggests that service ecosystems are not preexisting or fixed. Rather, systems of service exchange are continually being formed and reformed through the enactment of practices.

Making the connection between practice theory and value cocreation, Korkman et al. (2010) argue that value is created through the enactment of practices and that a central aspect of the practices is the integration of resources. In other words, as practices are enacted, resources are integrated. This focus on resource integration helps to make a more explicit connection between practice theory and value cocreation, and it broadens the scope of market practices beyond exchange-specific practices to include those practices associated with other forms of resource integration, such as sharing (Belk 2010), gift giving (Sherry 1983), word of mouth (Brown and Reingen 1987), and, more generally, specialization in knowledge and skills (operant resources) that are found in systems of service exchange.

Broadening the scope from exchange to value cocreation, *resource integration* can be conceptualized as a *central practice in value cocreation*. This is because as actors enact practices to integrate resources, they interact with other actors and contribute to value cocreation processes. These processes intersect with other value cocreation processes and form networks of relationships—or systems, in Giddens' (1984) terms (Akaka and Chandler 2010). However, the enactment of practices not only contributes to the development of relationships (Akaka and Chandler 2010, Chandler and Vargo 2011), but it also contributes to the social structures that compose service ecosystems as well (Edvardson et al. 2010, Giddens 1984). It is important to note that a service-ecosystems view shifts from a focus on transactions or dyadic exchange to various forms of interaction and resource integration. This broader view of service exchange systems emphasizes the strength of "largely loosely coupled" relationships (Vargo and Lusch 2011a) or "weak ties" (Granovetter 1973) in the cocreation of value as well as the (re)formation of service systems.

How Resource Integration Drives Value Cocreation

The S-D logic ecosystems view of service systems reframes value creation by recognizing that value is proposed by a service provider but determined by a service beneficiary. This emphasis on value cocreation suggests that the goal of firms, or service providers, is not so much to customize offerings, but rather to enable customers to customize their own assortment of resources, which are based on individual needs and other available resources. Thus, to understand the key drivers of value cocreation in service ecosystems, it is necessary to understand how and why service beneficiaries (e.g., customers) integrate resources to cocreate for themselves (and for others).

Alderson (1957), an early advocate of a systems perspective in a market context, provides insight into how and why resources are integrated. Alderson proposed three phases for matching heterogeneous resources with heterogeneous customers: shaping, fitting, and sorting. Whereas the first two refer to the form and fit of an offering, the third phase, sorting, explores avenues for effectively matching resources with the needs of customers, and it focuses attention on the accessibility and adaptability of resources within systems of exchange.

To emphasize the importance of customer circumstance (i.e., context) in value cocreation, Alderson specifically highlights the potency of a customer's assortment, the aggregate access to resources at a specific time and place. He argues that value is ultimately determined by the assortment of resources as a whole. Thus, the benefit of a service rendered is directly related to a customer's knowledge and skills as well as access to other resources. Alderson also emphasizes the need and rarity of assortment closure by explaining that when an assortment is closed, an actor has access to all the resources he or she needs at any given time and place. In other words, assortment closure prepares customers for solving a particular problem in a particular context, but because customers rarely have everything they need, they continually engage in exchange in order to access resources and attain assortment closure.

An S-D logic, ecosystems view focuses on the integration of resources to solve problems and suggests that value cocreation is driven by continually integrating resources to strive for, or maintain, assortment closure. In line with Alderson's (1957) view on assortment closure, Normann (2001) introduces the concept of *density*, a measure of the amount of information, knowledge, and other resources (e.g., institutions) that an actor has at any given time and/or place to solve problems. Importantly, this concept addresses the issue of accessibility and adaptability in a system. Normann argues that firms should focus on their ability to break up, or "unbundle," and put together, or "*rebundle*," available offerings. In the same way, customers can *rebundle* offerings to derive solutions based on their own access to resources when and where they are needed.

This suggests that developing new ways to integrate resources does not necessarily occur in a linear manner. In fact, service beneficiaries often need the flexibility to rebundle resources because their use of an asset is not isolated or focused solely on the present; it is assimilated with surrounding resources and considers future benefits of use. In this way, value cocreation occurs as a firm unbundles and rebundles, and it enables service beneficiaries to unbundle and/or rebundle their offerings with those from other resource providers. The self-customization and rebundling of resources enhances the customer's cocreated experience and strengthens ties between the relationships among firms and customers.

Importantly, S-D logic's primacy of operant resources in value cocreation also emphasizes the idea that, although assortment closure or density often involves having access to particular tools, it *always* requires the knowledge and skills to solve a particular problem or create a solution. The rules and norms establishing solutions to everyday problems are part of structures (Giddens 1984) or institutions (Williamson 2000). Thus, a service-ecosystem view on value cocreation, as presented above, considers the material resources and processes by which they are developed as part of the value cocreation process, but these resources and processes are nested within larger processes and influenced by the application of social contexts and individual competencies. In this view, value cocreation becomes an iterative process, driven by the integration of operant (e.g., knowledge, skills, social norms, meanings) and operand (e.g., goods, money) resources. This view provides important insight into how value cocreation occurs in service systems—composed of people, organizations, and resources—and how resource integration practices drive value cocreation and the (re)formation of service systems.

Service Systems as an Outcome of Resource Integration and Value Cocreation

The consideration of resource integration as a central practice for value cocreation underscores the importance of practices and institutions in service systems. This view suggests that resource-integration practices and value cocreation processes contribute to the creation of value as well as service systems. In this view, as actors (e.g., firms and customers) attempt to create value for themselves and for others, they draw on and contribute to the institutions—social norms and standards—that recursively guide the enactment of practices (Akaka and Chandler 2010). Vargo and Lusch (2011a) argue that institutions are a critical aspect of value cocreation and the formation of ecosystems. In particular, they propose that actors or systems must rely on social institutions, such as monetary systems and laws, to successfully regulate interaction and exchange. Moreover, because service (eco)systems are loosely bound and always changing (Vargo and Lusch 2011a), many of these exchange encounters are organized via soft or informal contracts, rather than hard or formalized negotiations. Thus, institutions (rules of engagement) are drawn on as resources in actors' efforts to create value for themselves and for others.

As discussed above, a practice approach helps to make the connection between actions and interactions and value cocreation. However, practices are not only a means for cocreating value but also a central component in the formation and reformation of service systems. In this way, institutions influence practices and stabilize systems, but because practices also influence institutions (structures) as well as relationships (systems), service systems (and the structures that guide them) are susceptible to change. The following sections discuss how resource integration and value cocreation contribute to the (re)formation of service systems by drawing on a particular practice approach called structuration theory (Giddens 1984).

Structuration of Service Systems

Structuration theory (Giddens 1984) provides a practice approach for studying value cocreation and value-in-context (Edvardsson et al. 2011), which is based on the idea that social systems are formed and reformed through the enactment of practices—routine actions or "doings and sayings" (Schatzki 1996). Giddens (1984) suggests that social systems (e.g., service systems) are composed of structures (rules and resources) and systems (reproduced relationships). He argues for a "duality" of structure that emphasizes the interdependent nature of structures and systems and articulates how the enactment of practices drives the reproduction of both. Structuration theory is helpful in understanding the role of institutions in resource integration and value cocreation because it underscores the recursive relationship between human actions and social structures. In particular, Giddens (1984) argues that the enactment of practices (human actions) influence and are influenced by the social norms and standards associated with a particular social system. He proposes two types of interaction or "integration," *social* integration and *systems* integration, to describe the relationships that exist in copresence (social integration) and those that are connected through structures (systems integration). The recognition of these two types of relations is important because it helps to shed light on the way in which value can be cocreated via direct and indirect interactions, and how relationships are constituted at systems and structural levels.

Structuration theory aligns well with S-D logic because it considers all human actors as (at least potential) operant resources—those capable of acting on other resources. Additionally, Giddens' (1984) conceptualization of structures as "rules and resources" emphasizes the social norms and standards driving human action as well as the ability or "capacity" of actors to integrate resources and apply them for benefit. Thus, this view helps to provide a richer perspective on service ecosystems, which can help to inform service science and, more specifically, the study of value cocreation in service systems. However, structuration theory is a very broad social theory. To develop a deeper understanding of its application to service science and systems of service exchange, we draw on a closer look at how structuration and practices relate to two of the main components of service systems—technology and value cocreation.

Orlikowski (1992) applies structuration theory to make an important connection between institutions and technology. She proposes a structurational model of technology and argues that institutions are important factors in the development and use of technology, but the use of technologies can vary depending on context. She argues, "While technologies may appear to have objective forms and functions at one point, these can and do vary by different users, by different contexts of use, and by the same users over time" (p. 403). This view emphasizes the recursive nature of systems embedded with technology.

The consideration of a duality of technology is important for understanding value cocreation in service (eco)systems because it emphasizes the operant and operand nature of technology. Orlikowski (1992, p. 406) argues,

> Technology is the product of human action, while it also assumes structural properties. That is, technology is physically constructed by actors working in a given social context, and technology is socially constructed by actors through the different meanings they attach to it and the various features they emphasize and use. However, it is also the case that once developed and deployed, technology tends to become reified and institutionalized, losing its connection with the human agents that constructed it or gave it meaning, and it appears to be part of the objective, structural properties of the organization.

In other words, the duality of technology allows for the consideration of *technology as an operand resource*—one that requires action taken upon it to be useful, but it also sheds light on how technology might also be considered as an *operant resource*—one that is capable of influencing other resources as well. Specifically, Orlikowski (1992) describes technology as a product of human action (operand resource) and as a medium of human action (operant resource). In her view, technology can be considered as an operant resource because it "facilitates and constrains human action through the provision of interpretive schemes, facilities, and norms" (p. 410). Figure 1 adapts Orlikowski's structurational model of technology to illustrate the process of value cocreation and structuration in service ecosystems.

Orlikowski's emphasis on the social construction of technology reinforces the idea that institutions are a critical resource for value cocreation. Offering a slightly broader view on technology, Arthur (2009) suggests that technology can be considered as a process as well as a product. For example, a smartphone may be considered a recently introduced technology, particularly with the popularity of the iPhone. However, this "product" is the result of a multitude of iterative processes associated with collaboration (suppliers and firm partners) and competition (replicating and improving on competitor offerings), as well as value cocreation (alternative uses of phones as communication and entertainment devices). Thus, in Arthur's (2009) view, technology is more than the phone or the product, as referred to by Orlikowski (1992). In this view, technology also includes the processes and the perspectives that influence its development, use, and improvement.

Figure 1. Structuration in Service (Eco)Systems
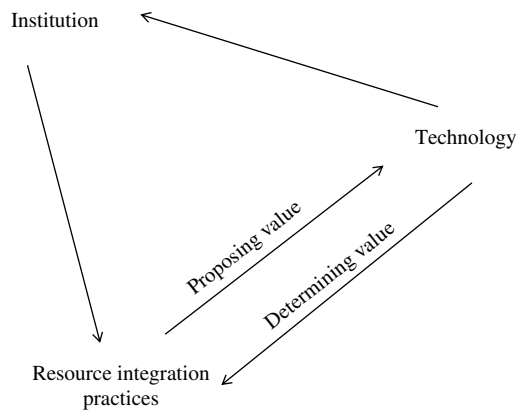
Source. Adapted from Orlikowski (1992, p. 410).

This dynamic view of technology suggests that although institutions guide human actions, which contribute to the development and use of technologies (e.g., ideas, products, processes), they are also susceptible to change as alterations in both the development and the use of technologies occur. In this model of structuration, the reinterpretation of technology by users, as they apply various technologies in their value cocreation practices, can potentially and recursively influence not only how value is determined but also how it is proposed. In addition, the processes of proposing and determining value both influence and are influenced by the institutions that guide interaction and value cocreation. Unlike traditional views on value creation that distinguish between the value-creation (production) and value-destruction (consumption) phases, this view suggests value cocreation occurs as value is proposed and determined, or through both the "design" and the "use" of a particular technology.

From an ecosystems view, when technology arises as a product of human action, it can be considered as a value proposition because it is being developed for a specific purpose and context. However, in accordance with Orlkowski's (1992) view on duality of technology, the value proposed is not necessarily the value derived from a particular technology because there is often a disjuncture between its design and use. Orlikowski (1992) calls the difference between design and use of a technology "interpretive flexibility." Furthermore, when technology is considered as a process as well as a product, the importance of institutions in value cocreation becomes even more salient. In value cocreation, this discrepancy between design and use is the difference between the value proposed and value determined through value-in-use or value-in-context. However, when technology is considered as a process as well as an outcome, both the proposition and the determination of value contribute to the cocreation of value-in-context. Importantly, because the value determined through use often differs from that which is proposed, value cocreation is iterative, and changes in technology are inevitable.

The (Re)Formation of Service Systems

The discussion about structuration (e.g., Giddens 1984, Orlikowski 1992) above suggests that the enactment of practices contributes to the "reproduction" of structures (e.g., institutions) as well as systems (interconnected relationships). However, the structures or institutions that guide the interaction within a particular system are often composed of multiple viewpoints. Sewell (1992) draws on the work of Giddens (1984) to discuss the multiplicity of structures in systems with the capacity for change. Sewell (1992, p. 16) argues that, as practices are enacted, multiple structures form "which exist at different levels, operate in different modalities, and are themselves based on widely varying types and quantities of resources."

Sewell (1992, p. 19) defines structures as "sets of mutually sustaining schemas and resources that empower and constrain social action and tend to be reproduced by social action." However, he is quick to point out that the reproduction of structure is never a given. Sewell argues that structures are at risk of instability and change because they are constantly intersecting with other structures. This view aligns with S-D logic's ecosystems view of systems of service systems and suggests that because the structures or institutions guiding particular systems are continually overlapping with those of other systems, they are subject to change. This consideration of multiplicity of structure in ecosystems sheds light on the way in which symbols are manipulated as they are integrated with other operant and operand resources across different service systems (Spohrer and Maglio 2010). With regard to technology, this suggests that as a particular technology is introduced into a new service system, the institutions that guide that system will help to determine the value of that technology—what Spohrer and Maglio (2010) call the "process of valuing"—in that particular social context.

This view of service systems helps to explain why some technologies fail in particular social contexts and thrive in others. For example, the recent success of Apple's iPad and the prior failure of its Newton device points toward the importance of institutions with regard to adaption and diffusion of a new technology. Theories regarding diffusion of innovations (e.g., Rogers 2003) suggest that factors associated with particular actors, such as positions and level of influence, as well as the configuration of a network, influence diffusion, or the spread of innovations. Although it is likely to be true that "systems" of reproduced relationships (Giddens 1984) did indeed influence the diffusion of this particular technology (e.g., Apple was not as interconnected with mainstream users at the time the Newton was released as they were with the release of the iPad), structuration theory suggests that there is another important aspect of the social system involved—namely, structure. From this view, it is not only the network of actors, or the actors themselves, that contribute to the valuation (Spohrer and Maglio 2010), or acceptance/rejection, of a particular technology, but the institutions (e.g., social norms and meanings) that guide actors' ability to determine the usefulness or value of a particular resource in a particular context.

In this ecosystems view, dynamic networks of actors—i.e., systems (Ng et al. 2011)—are interrelated with structures—i.e., institutions (Vargo and Lusch 2011a, b)—in service systems. Drawing on the practice literature, including Giddens' (1984) structuration theory, we argue that the enactment of resource-integration practices contributes to the reproduction of service systems (composed of systems and structures) as well as the cocreation of value—or the combined efforts of individual service systems to create value for themselves and for others. Because structures of rules and resources are interrelated with systems of reproduced relationships, changes in structures correspond with changes in systems as well. Thus, to fully conceptualize how value is cocreated and service systems are formed and reformed, a deeper understanding of the actions (resource integration practices) and institutions that shape them is needed (Edvardsson et al. 2011).

Concluding Remarks

This paper proposes an S-D logic ecosystems approach for advancing the understanding of value cocreation and service systems (re)formation. It broadens the perspective of value cocreation in service systems to consider the importance of institutions in connecting people and technology. A service ecosystems view provides a means for studying how the cocreation of value draws on and contributes to the social context through which it is derived in systems of service-for-service exchange—i.e., service systems. It is important to note that the interdependent relationships found among service providers and service beneficiaries within systems of service exchange vary widely in types of entities (Ostrom 2010), strengths of relationships (Granovetter 1973), and patterns of networks (Chandler and Wieland 2010). Furthermore, they are connected through multidimensional structures (Sewell 1992), which are composed of collective values and meanings. These structures, or institutions, guide and are guided by resource-integration practices and interconnected value cocreation processes (Akaka and Chandler 2010).

In addition, a service ecosystems view suggests that systems of service systems are not made up of static connections, and a service system's assortment of resources is almost never completely closed. Because of this, exchange flows take place both within and among service systems, ultimately interweaving a multitude of service systems into a larger ecosystem. This is why service ecosystems are best studied by oscillating the perspective among various levels—micro, meso, and macro—of interaction (Chandler and Vargo 2011). In particular, further research is needed to better understand the way in which resource-integration practices can be (re)combined into a multitude of various interconnecting value cocreation processes that ultimately form dynamic networks or systems (Akaka and Chandler 2010, 2011; Chandler and Vargo 2011). Furthermore, additional studies of the way in which micro-, meso-, and macro-level structures such as institutions guide these actions and interactions are needed that include movement between micro (e.g., dyads), meso (e.g., triads), and macro (e.g., networks) levels of context (Chandler and Vargo 2011). This multilevel view enables the investigation of institutions, as well as relationships, at various levels of interaction within a service system. Because exchange drives interaction across service systems, as well as within them, ecosystems are created and sustained by shared norms or institutions associated with the exchange and application of a variety of resources. It is the ongoing recombination of (operant) resources that drives innovation, as well as value cocreation, within and among service systems (Arthur 2009, Vargo and Lusch 2011).

We believe that an S-D logic, ecosystems view provides a platform for broadening the concept of value cocreation by considering the role of institutions and its relationship with technology in service systems. However, this view of dynamic value cocreation is just beginning to unfold. This paper sheds light on how an ecosystems perspective can contribute to developing more systematic processes for cocreating value by focusing on resource

integration as a central practice in value cocreation and systems (re)formation. Further work is needed to better understand particular resource-integration practices and how they relate to other practices associated with value cocreation. Moreover, a deeper understanding of the nature and role of technology as well as institutions is needed to gain a better understanding of the multidimensional contexts that frame value creation and exchange (Chandler and Vargo 2011, Edvardsson et al. 2011). We hope that as S-D logic and service science continue to develop alongside each other, additional insights about value cocreation and systems (re)formation and more systematic approaches for improving value cocreation and innovating service will emerge.

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