



Service Science

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Service-Dominant Logic as a Foundation for Service Science: Clarifications

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Service science is an emerging discipline concerned with the evolution, interaction, and reciprocal cocreation of value among service systems (Maglio and Spohrer 2008; Spohrer et al. 2008). Service-dominant (S-D) logic (Vargo and Lusch 2004a 2008) is an alternative to the traditional, goods-dominant (G-D) paradigm for understanding economic exchange and value creation. This service-centered view is based on the idea that service – the application of competences for the benefit of another – is the basis of all exchange. S-D logic has been identified as an appropriate philosophical foundation for the development of service science (Maglio et al. 2009). However, perhaps partly because S-D logic is first necessarily encountered through the G-D logic paradigm to which it runs counter, it is sometimes misinterpreted and thus misrepresented. This paper discusses S-D logic as a foundation for service science by reviewing the foundational premises of S-D logic and clarifying several misinterpretations related to 1) the S-D logic meaning of “service,” 2) the role of service in economic exchange, and 3) the nature of value cocreation. Drawing on these clarifications, implications of an S-D logic foundation for service science are proposed.

Key words: service science; service-dominant logic; service; value; value cocreation; coproduction; operant resources

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1. Introduction

Service science is an emerging discipline concerned with the evolution, interaction, and reciprocal cocreation of value among service systems – dynamic configurations of resources capable of providing benefit to other service systems (Maglio and Spohrer 2008; Maglio et al. 2009; Spohrer et al. 2008) and themselves. It is motivated by a lack of integrated, foundational knowledge to inform its normative goal of assisting organizations in the process of service innovation and provision in order to realize more predictable outcomes (Spohrer et al. 2007) as firms transition from a manufacturing orientation to a service orientation.

Service-dominant (S-D) logic (Vargo and Lusch 2004a 2008) is a service-centered alternative to the traditional goods-centered paradigm for understanding economic exchange and value creation that has been identified as an appropriate philosophical foundation for the development of service science (Cambridge University and IBM 2007; Maglio et al. 2009). S-D logic is based on the idea that service, the application of competences for the benefit of another, is the fundamental basis of value creation through exchange. That is, *service is exchanged for service* (i.e., by service systems) and goods, when involved, are service-provision vehicles. However, perhaps partly because S-D logic is first necessarily encountered through the goods-dominant (G-D) paradigmatic lens to which it runs counter, it is sometimes misinterpreted and thus misrepresented. If S-D logic is to be used foundationally for service science, these misinterpretations and misrepresentations have path-dependency implications for the development of the discipline.

The purposes of this article are to highlight and clarify some of the predominant misconstruals and to underscore the implications for an S-D logic foundation for service science. The most common of these relate to (1) the S-D logic meaning of the term “service,” (2) the (inadequacy of the) justification for S-D logic and service science based on an apparent transitioning from a manufacturing to service economy (in some countries), and (3) the nature of value (co)creation and the related idea of coproduction in S-D logic. To achieve these purposes, we first briefly review service science. We then provide a brief outline of S-D logic, particularly as it relates to a service science foundation, and then clarify the primary misconstruals. Finally, we offer some implications of an S-D logic foundation for the study and practice of service science.

2. Service Science

Service science is a(n) (inter)disciplinary field that “combines organization and human understanding with business and technological understanding to categorize and explain the many types of service systems that exist as well as how service systems interact and evolve to co-create value” (Maglio and Spohrer 2008, p. 18). Service systems are “value co-creation configurations of people, technology, value propositions connecting internal and external service systems, and shared information” (Maglio and Spohrer 2008, p. 18). As noted, S-D logic (Vargo and Lusch 2004a 2008), including its definition of service as “the application of competences for the benefit of another,” has been proposed as a theoretical foundation for the development of service science and the study of service systems (Maglio and Spohrer 2008; Lusch, Vargo, and Wessels 2008).

Service systems are considered the basic unit of analysis in service science. These dynamic network structures are conceptualized as “open system[s] (1) capable of improving the state of another system through sharing or applying its resources...and (2) capable of improving its own state by acquiring external resources” (Spohrer et al. 2008). They can range in size from an individual person to a world-wide exchange system (e.g., the global economy). Maglio and Spohrer (2008, p. 18) explain:

The smallest service system centers on an individual as he or she interacts with others, and the largest service system comprises the global economy. Cities, city departments, businesses, business departments, nations, and government agencies are all service systems. Every service system is both a provider and client of service that is connected by value propositions in value chains, value networks or value-creating systems (Normann 2001).

The normative function of service systems is to connect people, technology and information through value propositions with the aim of cocreating value for the service systems participating in the exchange of resources within and across systems.

At the heart of service science is the transfer and sharing of resources within and among service systems. Four categories of resources have been noted and examined: (1) resources with rights, (2) resources as property, (3) physical entities, and (4) socially constructed entities (Maglio and Spohrer 2008). Maglio and Spohrer (2008, p. 19) explain that “[e]ntities within service systems exchange competence along at least four dimensions: information-sharing, work-sharing, risk-sharing, and goods-sharing.” They suggest that the key to understanding the exchange of resources within service systems is found in the distribution of competences, such as knowledge and skills, among service systems and understanding the value propositions that connect such systems. In service systems, the purpose and driver of interaction and exchange is the cocreation of value (Spohrer et al. 2008).

Spohrer et al. (2008) also explain that service systems engage in three main activities in order to cocreate value: (1) proposing value, (2) accepting a proposal, and (3) realizing the proposal. Thus, at least two service systems must engage in both applying and integrating resources in order for service to be realized and for value cocreation to occur.

3. Alternative Foundations for Service Science

Generally, there are two service(s) orientations that could inform service science. One is grounded in the traditional view of economic exchange and value creation as primarily involving goods (tangible products), with services conceptualized relative to goods, either as add-ons to (e.g., after-sale service) or a special type (i.e., intangible products). This orientation has been called “*goods-dominant (G-D) logic*” (Vargo and Lusch 2004; 2008). Alternatively, *S-D logic* considers service in its own right (i.e., without reference to goods) as central to economic exchange and value creation, though it sees goods as playing a central role in service provision.

3.1 Goods-Dominant Logic

Essentially, G-D logic sees economic exchange in terms of the production and distribution of units of output (see Vargo and Lusch 2004a), which acquire value during the design and manufacturing process. Ideally, in G-D logic, this output is tangible, produced away (separate) from the interference of customers, standardizable, and capable of being inventoried until sold, all to enable maximum efficiency in operations.

In G-D logic “services” are typically conceptualized as output that are characterized as “intangible,” “heterogeneous,” “inseparable,” and “perishable” (Zeithaml, Parasuraman, and Berry 1985). That is, services are what goods are not – somewhat less-than-ideal products or not-such-good “goods.” From a G-D logic perspective, it appears that economic activities in many counties (and firms) are increasingly migrating to services from goods,

since more and more of these activities cannot be categorized as goods (and thus must be services). This sets up the rather disquieting implication that economies evolve toward second-rate activity and, by implication, that service science is something of a study of inferior economic phenomena. However, the G-D logic construal can also be seen as an aberration, stemming from some contextually specific notions about normative, quasi-economic, trade-related processes developed over 200 years ago. Brief consideration of the historical foundations of G-D logic is therefore instructive.

3.2 G-D Logic Foundations

The foundation for G-D logic is rooted in economic philosophy and economic science, as they developed from the work of Smith (1776). At the onset, Smith built his political-economic views on the proposition of the efficiency of division of labor and the related idea of the necessity of exchange. He initially established real value in terms of the labor required to achieve a benefit or “value-in-use.” Labor, for Smith, did not mean so much physical labor, as it did the development of specialized knowledge and skills that could be applied for benefit and thus used in exchange.

Although he was later to be called the “father of economics,” this was not Smith’s (1776) purpose. Rather, it was to define how England (or any country) could become wealthy through international trade in the context of the 18th Century. That context was one in which it was not possible to exchange applied knowledge and skills except through personal travel, which was slow and inefficient, or by embedding them in manufactured objects. That is, digitization and telecommunications had not yet been developed.

It was also the beginning of the Industrial Revolution. Thus, in this context, Smith consigned the term “production” to the creation (manufacture) of surplus tangible goods that could be exported for international trade. Other applications of knowledge and skills were seen as essential for personal and national wellbeing; they just could not be used (efficiently) in national wealth creation through international trade and thus were not “productive” in the sense of creating tangible, exportable goods. Given his limited purpose and the problems of measuring real value, he also restricted his focus on value to “nominal value” or “value-in-exchange” – the price paid for something in the market. However, as noted, Smith acknowledged that “real value” was represented by “value-in-use” – value as realized and determined by the individual.

Coupled with Say’s (1821) notion of utility, which became associated with this nominal value, and the desire of economic philosophers’ to turn economics into a legitimate science in the Newtonian tradition, products, with embedded utility, represented by price, became the foundation for marginal utility theory and neo-classical economics. And thus the goods-centered model became the dominant paradigm for the business-related disciplines that followed (Vargo and Morgan 2005), including, management, marketing, operations, information technology, etc. But the context has changed and our models of understanding must be expanded, if not questioned and revised. This likely extends beyond mere modification.

3.3 Service-Dominant Logic

S-D logic proposes an alternative perspective for the study of economic exchange, which actually is more consistent with Smith’s more foundational notions of real value (applied, specialized knowledge) and value-in-use than the G-D logic that grew out of his restricted work on national wealth creation. This service-centered view suggests that market exchange is the *process* of parties using their specialized knowledge for each other’s benefit – that is, for mutual service provision. S-D logic is grounded in ten foundational premises (Vargo and Lusch 2008), which are presented in Table 1 and are briefly elaborated below as they relate to service science and service systems. The influence of S-D logic in and its compatibility with service science are apparent in its language and framework.

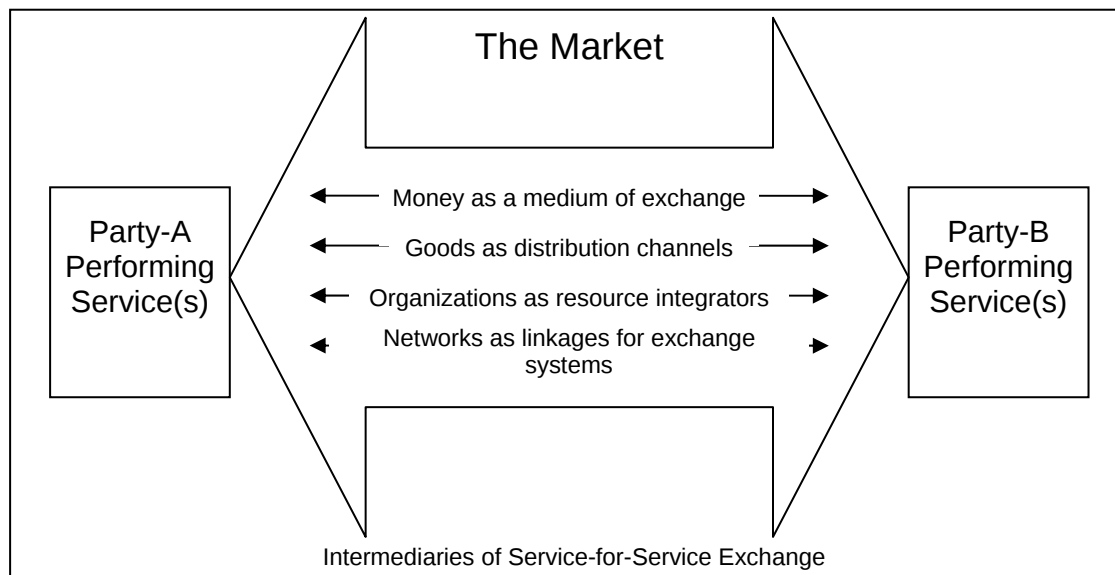
As mentioned, S-D logic’s basic tenet is that *service* (singular, indicating a process vs. the plural “services,” indicating intangible units of output) – the application of competences for the benefit of another – is the basis of all exchange (FP1). In other words, service is always exchanged for service; thus all economies are service economies (FP5). Although S-D logic proposes that service is the basis of all exchange, it also recognizes that the direct service-for-service exchange is often masked by the complexities of the market (FP2), including indirect exchange among service systems. That is, the process of value creation within and between service systems becomes increasingly complex and less apparent as intermediary systems develop (Figure 1). In S-D logic, these market-related intermediaries (e.g., goods, money and organizations) maintain important roles in facilitating the process of exchange (FP3). However, they are not the primary purpose or fundamental source of exchange and value creation.

Table 1 Foundational Premises of Service-Dominant Logic

	Premise	Explanation/Justification
FP1	Service is the fundamental basis of exchange.	The application of operant resources (knowledge and skills), “service,” is the basis for all exchange. Service is exchanged for service.
FP2	Indirect exchange masks the fundamental basis of exchange.	Goods, money, and institutions mask the service-for-service nature of exchange.
FP3	Goods are distribution mechanisms for service provision.	Goods (both durable and non-durable) derive their value through use – the service they provide.
FP4	Operant resources are the fundamental source of competitive advantage.	The comparative ability to cause desired change drives competition.
FP5	All economies are service economies.	Service (singular) is only now becoming more apparent with increased specialization and outsourcing.
FP6	The customer is always a cocreator of value.	Implies value creation is interactional.
FP7	The enterprise cannot deliver value, but only offer value propositions.	The firm can offer its applied resources and collaboratively (interactively) create value following acceptance, but can not create/deliver value alone.
FP8	A service-centered view is inherently customer oriented and relational.	Service is customer-determined and cocreated; thus, it is inherently customer oriented and relational.
FP9	All economic and social actors are resource integrators.	Implies the context of value creation is networks of networks (resource-integrators).
FP10	Value is always uniquely and phenomenological determined by the beneficiary.	Value is idiosyncratic, experiential, contextual, and meaning laden.

(Source: Adapted from Vargo and Lusch 2008)

Figure 1 Service(s) Exchanged for Service(s)



(Source: Vargo et al., in press)

S-D logic establishes the primacy of *operant resources* (those that act upon other resources to create benefit), such as competences, over *operand resources* (those resources which must be acted on to be beneficial), such as natural resources, goods, and money (Constantin and Lusch 1995; Vargo and Lusch 2004a). That is, operant resources, such as knowledge and skills, are the underlying source of value. In addition, S-D logic argues that value-creating resources are not confined to the firm; customers, suppliers, and other stakeholders also constitute operant resources and contribute to value creation.

More generally, S-D logic contends that value is always cocreated (with the customers and others) (FP6) and thus that firms cannot create and deliver value; they can only propose value (FP7) and provide service as input to its realization. Ultimately, value is phenomenologically and contextually derived (FP10) by the service beneficiary (i.e., customer). In other words, value is not created until the beneficiary of the service, often the customer, integrates and applies the resources of the service provider with other resources, in the context of its own, specific, available resources, including those from other service systems. In the language of S-D logic, these service systems are characterized as “resource integrators” (FP9). Thus, the cocreation of value incorporates the integration and application of (integrated) resources from service providers (e.g., the firm and other market-facing, public and private resource integrators), by service beneficiaries (e.g., customers) but, because value is always (contextually) beneficiary specific, it is always determined by the beneficiary (FP10).

4. (Mis)Construals and Clarifications

Although S-D logic has been suggested as foundational to service science, it and, more generally, service science, is often, viewed from a G-D logic perspective. Thus, service science sometimes appears to be partially developing, inadvertently, if not unknowingly, on G-D logic assumptions. For example, it sometimes seems to reflect the *goods* vs. *services* distinction, an artifact of G-D logic – essentially *tangible* vs. *intangible* output – rather than on a conceptualization of service as a process that can be provided directly or through a good. Indeed, it is common to find reference to “services science,” rather than “service science” (see discussion in following section) even though the latter is the common reference used by its primary originators (e.g., Spohrer and Maglio 2008). Thus, whereas the discussion of services has drawn attention to the dynamic aspects of exchange, including those in which S-D logic is grounded, the power of the G-D logic paradigm remains. More generally, evidence of the G-D logic paradigm can be found in misconceptions related to several fundamental principles of S-D logic: (1) the meaning of service, (2) the contention that all economies are service economies, and (3) the nature of value creation.

4.1 The Meaning of Service

The *differentiation* of goods and services by distinguishing between them in terms of alternative types of products, even in the effort to direct positive attention towards service(s), reflects a central, G-D logic orientation, one that is specifically questioned in S-D logic (e.g., Vargo and Lusch 2004b; Lovelock and Gummesson 2004). As noted, in G-D logic, “services” are seen as different (from goods), usually inferior, *units of output* (products); in S-D logic, “service” is conceptualized as a *process* that represents the basis of social and economic exchange. In this light, goods, if involved, are seen as conduits of service provision. Thus, service, in S-D logic, is a *transcending* concept; service can be provided directly or through a good but it is always the common denominator of social and economic exchange. This difference in the meaning of the term service is crucial for the implementation of an S-D logic foundation for service science and it leads to a rather ironic situation: *there are no “services” in service-dominant logic*, except as the term is occasionally used to refer to different processes – never intangible output internally created by the firm.

The shift from focusing on “services” as intangible units of output to “service” as the process of applying one’s competences to benefit another moves the emphasis of exchange to operant, rather than operand, resources. In other words, whereas G-D logic and its separation of services from goods focuses on units of output (either tangible or intangible), S-D logic focuses on service as an activity with benefit for another party and, by implication, the *relationship* between service and goods.

The S-D logic meaning of service and its most basic principle, that service is the basis of all exchange – service is exchanged for service – suggests that service is not only recently gaining in importance. Rather, “it is only from the perspective of a model that includes the fundamental assumption that exchange is driven by goods (G-D logic) that the importance of service is just now becoming apparent and that the economy is perceived to be transitioning from goods focused to service focused” (Vargo and Lusch 2006, p. 45), as discussed in the following section. This in turn broadens the domain of service science.

4.2 All Economies are Service Economies

The contention that there is a need for increasing attention toward service(s) because of a growing “services economy,” or “service revolution” (e.g., that approximately 70% of economic activity in developing countries is in “services”) is, ironically, something of a *G-D logic artifact*. The criterion is based on what S-D logic considers to be mythical, intractable distinctions between goods and services as alternative forms of products, and the associated classification system (Vargo and Lusch 2004b).

Whereas an S-D logic orientation actually strengthens the argument for the need for service-related thinking, including the need for the development of service science, it does so by focusing on service as an untethered activity – that is, conceptualized without residual reference to goods (i.e., what goods are not). In short, in an S-D logic view, service is what is always exchanged and thus there is not so much of a *service revolution* as there is a *service realization*. This foundational understanding of service is *essential* if “service system” is to be an inclusive (of value-creating activities) term and thus service science is to be inclusive of all phenomena involved the mutual creation of value through service provision. Without this inclusivity, almost by definition, service science becomes a science of the exception – a science of somewhat inferior products.

The apparent increase in service exchange in the economy is attributable to two phenomena: (1) the widespread adherence to the dominant, good-centered paradigm (in economics, business, and society) of economic exchange, which classifies service residually and (2) outsourcing, resulting from continued refinement in specialization and market access. Both can be linked to advances in information technology (IT) and information communications technology (ICT) or what Normann (2001) calls “dematerialization” and “liquification.”

Consider Smith’s technological context. In it, the most efficient way to export specialized knowledge was to embed it in tangible goods that could be traded internationally – his primary focus. In short, IT had not progressed to the point that information (e.g., knowledge and skills) could be digitized and sent through telecommunications. Thus, it was convenient to characterize only the creation of exportable tangible goods as “productive,” by his national wealth-creation criterion, even if not particularly accurate (at least by the more encompassing standard of national and personal wellbeing), as noted by most other economic philosophers of the time. This focus on tangible production (goods) also fit conveniently with the major technological advances of the time, now considered to be part of the Industrial Revolution, and later with the desire for an economic science in the Newtonian tradition. But focus on convenience should not be confused with accuracy or robustness, especially when the context changes. Neither should a focus on tangible goods be confused with the nonexistence or lesser importance of what is now called service.

Consider Smith’s (1776) context again. Most economic exchange at that time (and prior) would be classified as service, even by today’s G-D-logic-based classification system. A suit of clothes was obtained through the *service* of a tailor, shoes from that of a cobbler, etc., to say nothing about the *service* of “churchmen, lawyers, physicians,” (Smith 1776, p. 415) etc., most of which Smith considered essential to wellbeing, just not productive by the national wealth standard. It was only as some of these former activities (e.g., garment making) were developed into micro-specializations (e.g., clothing design, cloth dying, and sewing) and moved into factories that “manufacturing” became a classification and only then through Smith’s “productive” notions that product manufacturing became the bases for classifying economic activity. In short, service did not just become part of economic activity following manufacturing. Indeed, it is probably more accurate that manufacturing represents a subset of service-provision activity (e.g., the mass production of textiles is a subset of the service of designing and sewing clothes).

What happened more recently, of particular note, is that specialization has increased exponentially. Smith argued that the division of labor is limited by the extent of the market but the reverse is also true. Thus, specialization (division of labor) begets further outsourcing (markets), which begets further specialization...ad nauseam. As more activities that had been considered part of manufacturing (goods production) operations (e.g., accounting, design, etc.) are outsourced, in a goods-based classification system, they disproportionately become classified as “services.” This of course is in addition to the increase in the outsourcing of direct-service, market-based activities (e.g., legal clerks and physician assistants) and governmental activities, all of which are necessarily classified as services in a residual classification system. In S-D logic, not only would these all be classified as service activities, but, as noted, so would manufacturing.

Also as noted, all of this is hastened by what Normann (2001) calls “dematerialization” and “liquification,” the separation of information from matter and the related ability to transfer information (e.g., specialized knowledge) without having to have it carried by people or embedded in stuff – that is, IT and ICT, respectively (Thompson and Rust 2006). Not only does dematerialization enable further specialization; it also enables outsourcing by increasing the scope of the market (e.g., globally). However, in so doing it also invalidates Smith’s implied premise of the essential role of tangible goods in trade and therefore, arguably, renders G-D logic unconvincing, if not impotent. One only has to translate Smith’s “labor” in his initial observation that “the labor of every nation is the fund which

originally supplies it with all the necessities and conveniences of life" (1776, p. vii) to *applied knowledge and skills* (what S-D logic defines as service), as he originally intended, to get to the idea that service is exchanged for service and is thus the basis for all economic exchange, rather than a subset of it.

4.3 Nature of Value (Co)Creation and the Role of (Co)Production

The meaning of value, the process of its creation, and the locus of its determination have been discussed since the time of Aristotle and are central to Smith's (1776) work, as well as that associated with S-D logic (e.g., Vargo and Lusch 2004a; 2008) and service science (Spohrer et al. 2007; Maglio and Spohrer 2008). Throughout this extended period, it has been recognized that there are, two broad conceptualizations of value: "value-in-exchange" and "value-in-use" (Vargo et al. 2008). Historically, value-in-use has been recognized as the real meaning of value, at least until Smith refocused on value-in-exchange for convenience, given his national wealth standard, rather than a personal (or national) wellbeing standard. As indicated, his work lead to G-D logic and its conceptualization of value as something "added" to products by the firm and other suppliers and intermediaries, a notion with which value-in-exchange is particularly compatible. Thus, in G-D logic, the customer is seen as exogenous to these value-adding activities; indeed, the customer is seen as a destroyer (consumer) of value.

More recently, attention has been refocused on value-in-use, to some extent indirectly, through service-marketing and B2B research. This refocusing points toward value as being cocreated with customers and determined by them, a theme that has been developed by Prahalad and Ramaswamy (2000; see also Normmann and Ramirez 1993) and others and adopted and elaborated in S-D logic. Likewise, service science has adopted the cocreation of value idea, at least nominally, although adherence to something of a production (and value-added, and value-in-exchange) orientation seems to prevail in some instances. As such, it suggests at least a residual adherence to the G-D logic notion of *making "services."* Arguably, this is manifested in at least some conceptualizations of "service-oriented architecture," "servitization," "service operations," "service factories," etc., all of which are often associated with service science, even if not fundamental to it. Even more contentiously, this residual adherence is possibly reflected in, if not partially driven by the "management" and "engineering" specifications of the extended moniker for service science – "service science management and engineering (SSME).

This contention is not in any way intended as an indictment of either management or engineering; it is just an observation that, as traditionally practiced, they tend to be focused primarily internally toward design specifications, operational processes and efficiencies in the creation of output, rather than toward the broader value cocreation space; thus, they often reflect something of a G-D logic influence. Neither is this contention intended to suggest an indictment of production processes and their role in value creation; rather, it intended to distinguish the concept of (co)production from the superordinate concept of (co)creation of value.

S-D logic's conceptualization of value *cocreation* goes beyond inviting the customer to participate in production or design processes (Vargo 2008). It suggests that there can be no value without the customer incorporating the firm offering into his or her own life. Although in the original S-D logic article, Vargo and Lusch (2004a) used the term "*coproduction*" instead of "*cocreation of value*" to represent this integrative meaning, since Lusch and Vargo (2006; see also Vargo and Lusch 2006; 2008), cocreation of value has been used to convey the customer's (and others) collaborative role in value creation (e.g., value-in-use) while mere customer participation in the development of a firm's offering (e.g., design, assembly, self-service), has been identified as coproduction in S-D logic. Based on these conceptualizations, the customer's role in *coproduction is optional*, whereas his/her role in value creation is not; *value is always cocreated*.

The idea of the customer as a cocreator is tied to the identification of all parties as resources integrators. That is, the service (direct or through a good) provided by one service system (e.g., the firm) represents a subset (often a small one) of the resources that have to be integrated to create value for another service system (e.g., a given customer). Consider the resources that have to be integrated to create nutrition through a home-prepared meal. These extend well beyond the services of the butcher (or other single vendor) and include other market-facing resources such as other ingredients, utensils, monetary resources, fuel, transportation, etc. It also requires integration of non-market-facing, personal resources, such nutritional knowledge, purchasing knowledge, cooking knowledge, suggestions and assistance of friends and family, and public recourses, such as institutions, like standards provided by food and drug agencies.

Therefore, customer participation in the value-creation process suggests a larger, more extended venue for value creation than the firm or firm-customer interaction because it implies that that neither the firm nor the customer has adequate resources to create value, either independently or interactively, in isolation. It points to a network-within-network conceptualization of relationships that converge on value creation through a web of resource integration. Vargo and Lusch (e.g., Vargo et al. 2009) have called these resource-integration networks *service ecosystems* –

loosely coupled systems of service systems. This, in turn, suggests that each instance of value creation is unique to and can only be assessed from the perspective of an individual service system.

The redirection of the focal point of value creation, away from a firm's output (and value-in-exchange) and towards the value derived and uniquely determined by an individual service system (e.g., customer – i.e., value-in-use) emphasizes a phenomenological and experiential conceptualization of value that has most recently been recognized in S-D logic as "*value-in-context*" (Vargo, Maglio and Akaka 2008). Value-in-context highlights the importance of time and place dimensions and network relationships as key variables in the creation and determination of value. Thus, value-in-context is uniquely derived at a given place and time and is phenomenologically determined based on existing resources, accessibility to other integratable resources, and circumstances. Value cannot be created independent of the beneficiary and then delivered.

All of this suggests that the *goal of service systems* is to provide *input into the value-creating processes of other service systems* and thus to obtain reciprocal input. This is done through service provision, the application of resources to contribute to the *density* of other service systems. Density creation is the process of "rebundling" "unbundled" and "liquefied" resources, in order to configure them for use by other service systems (Normann 2001, p. 27). Density is a measure of the "best combination of resources mobilized for a particular situation." Technology (e.g., management, engineering, IT, etc.) has increased the ability to liquefy and transfer information and has helped, not only to create new market offerings, but also to reconfigure the market and the service systems of which it is composed. In S-D logic, density creation is the new operations.

5. Implications for Service Science

The S-D logic position on the above issues can be summarized as follows:

1. *There are no "services."* There is *service*, the act of doing something for another party, directly or through a good. We can serve but we *cannot make services*.
2. *There is no new service economy.* Service has always been the basis of exchange. Manufacturing (and thus the Industrial Revolution) is just a special case of service provision.
3. *Value is always cocreated.* If goods are used as vehicles of service they might be coproduced but the *cocreation of value is not optional*.

So, what does all of this matter to service science? We suggest that building service science on a G-D logic grounded conceptualization of services (intangible goods), justified on the basis of an apparent increase in the relative predominance of these intangible goods, and thus informed more by concepts of their coproduction than the more-encompassing cocreation of value, places severe restrictions on advancing the positive goal of creating a science of service or the normative goal of assisting organizations in the task of service innovation. What is needed is a *true science of service*.

Building a true science of service is of course what those involved in its development are attempting to do. But the paradigmatic grip of G-D logic is both subtle and powerful. Most notably, it shows up in the language of the disciplines, practices, and governance of business, as well as everyday social discourse and thus guides the way the world is viewed. In addition to the subtle but commanding connotations of the word "service," consider the potency of core, associated, G-D logic inspired terms like production, consumption, supply chain, value-added, good, product, industry, etc. in shaping our vision of economic activity. Consider the negative regard for the "services sector" that has developed from viewing services from G-D logic from which we get notions of goods production as the only "good jobs." Consider the "services science" uphill battle of successfully soliciting government and private support, much less popular support, for the development of a science in which the domain is defined in terms of "non-good-goods" with an implied goal of increasing trade in and "production" of these inferior types of output. Arguably, this (G-D logic informed) "services science" is faced with this less-than-compelling, difficult task.

On the other hand, consider the case for an S-D logic motivated "service science." Think of the different direction and potential appeal of a lexicon of mutual benefit through "service," consisting of serving, cocreation, value creation, benefit, reciprocity, relationship, interactivity, network, etc. Consider the rational appeal of a science of service based on service as a central concept, rather than a residual activity. Consider the relative likelihood of support from public and private sources for a science aimed at the core of economic activity, rather than a sector (especially a less-than-desirable one, even if large) of it. In summary, consider the compelling nature of an S-D-logic-grounded, "service science."

But the importance of the distinction between a science of “services” and science of “service” extends beyond appeal and compulsion. The alternative foundations point academics and practitioners in differing directions. That is, the management and engineering of services arguably implies a continued, primarily internal focus on *efficiency* for the benefit of the focal service system (e.g., firm), with particular attention to the difficulties created by the inherent inefficiencies of services production compared to goods production, with *effectiveness* for the benefiting service system (e.g., customer) being important, but secondary. On the other hand, a reciprocal-service focus is defined in terms of benefit for both parties, thus is *inherently effectiveness and efficiency focused*. This and its relational, cocreative perspective on value creation expand the role of management and engineering (as well as marketing, IT, etc.) by extending the disciplines to this broader venue of value creation. That is, the task is assisting other service systems in their respective value-creation activities by using resource integration and application to offer platforms for further resource integration and application by other service systems. This, in turn, points toward “management” and “engineering” (or at least intentional participation in) of larger and more complex service ecosystems to create value for the focal service system (e.g., the firm). These functions are clearly expanded beyond those associated with the traditional production and related roles.

None of this is intended to suggest that those adopting an S-D logic perspective have it all right. There is no monolithic S-D logic perspective. Rather, it represents an attempt at finding the convergence of a host of potential similarities in thought developing in what often are seen as otherwise disparate research streams and sub-disciplines in marketing, operations, information technology, economics, etc, which are arguably, at least partially, being driven by the common inadequacy of our foundational, good-centered models of economic exchange. It represents an evolution that is itself evolving. Thus, we suggest that in the need for a science of service, even though services operations, services management, and the role of services sectors of the economy have all be studied for decades or longer, implies something remains missing. We suggest it is the full development of a true science based on *service and service exchange*, rather than more adaptation of *services models*.

6. Conclusion

S-D logic has been recognized as a potential philosophical foundation for a science of service. According to Maglio and Spohrer (2008, p. 19), “service-dominant logic might provide just the right perspective, vocabulary, and assumptions on which to build a theory of service systems, their configurations, and their modes of interaction.” The advancement of service science continues to incorporate many S-D-logic conceptualizations, such as value cocreation and resource integration (Spohrer et al. 2007; Maglio and Spohrer 2008). However, to clarify what an S-D logic foundation of service science means, we have addressed several misinterpretations and misconceptions about S-D logic, largely attributable to a latent, G-D logic influence.

Much of the literature seems to suggest that the importance of service science and the study of service systems stems from the evolution to a new “service economy” and the growth of the “service sector” (Spohrer et al. 2007). However, the core foundational premise of S-D logic is based on the idea that service is the basis of all exchange and, thus, all economies are service economies and all businesses are service businesses (Vargo and Lusch 2004a). This broadens the scope of service systems beyond specific types of industries or output and focuses on the process of value cocreation that underlies all exchange.

Additionally, from an S-D logic perspective, the venue for value creation expands beyond the confines of the individual or pairs of service systems and value creation becomes a dynamic, ongoing process involving systems of service systems. We suggest that this collaborative model of value-creation, driven by mutual service provision, rather than one based on the making and selling of services (intangible goods), offers a conceptual foundation that potentially provides a more robust foundation for the advancement of a service-centered, systems-oriented science of service.

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