REFRAMING SUPPLY CHAIN MANAGEMENT: A SERVICE-DOMINANT LOGIC PERSPECTIVE

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Shifting the dominant thinking of supply chain management toward the concepts of service, value cocreation, value propositions, operant resources, networks, service ecosystems and learning opens up many research opportunities and strategies for improved organizational performance. The emerging thought world of service-dominant logic is presented as a means to reframe supply chain scholarship and practice for increased relevance and impact.

Keywords: service-dominant logic; systems; networks; value

INTRODUCTION

Recently a variety of scholars and practitioners have begun to reexamine the fundamental purpose, processes, and functions of supply chains and also how to best characterize them in a global competitive and supply environment (Chen and Paulraj 2004; Larson, Poist and Halldorsson 2007). A view is emerging that is refocusing SCM on partnerships, relationships, networks, value creation and value constellations (Spekman, Kamouff and Myhr 1998; Bovet and Martha 2000; Hoyt and Huq 2000; Gunasekaran and Ngai 2004; Min, Mentzer and Ladd 2007; Lusch, Vargo and Tanniru 2010).

Within the marketing literature a rapidly developing and integrated body of thought centered on service-dominant logic (S-D logic) has particular relevance to SCM as it seeks a more transcending perspective (Vargo and Lusch 2004a, b, 2008; Lusch and Vargo 2006; Lusch, Vargo and O'Brien 2007). S-D logic is aligned with Metz's observation (1998) that SCM is moving into a "super" role, which integrates the functions of marketing, product development and customer service.

Services have historically been defined in terms of what goods were not. Goods-related industries included extractive industries such as agriculture, mining, forestry and fishing and manufacturing industries such as durable and nondurable goods industries. The residual was defined as services and included education, health care, distribution, retailing, entertainment, legal and many other industries largely focused on nontangible offerings or alternatively services were nongoods. S-D logic, however, looks at the very nature of service and accordingly defines *service as a process* or as the *use of one's resources or competences for the benefit of another entity* (Vargo and Lusch 2004a). S-D logic argues that service is the basis of economic activity. S-D logic focuses on the process of service versus a goods-dominant (G-D) or manufacturing logic that focuses on the production and provision of outputs. For instance, computers, forklifts, pallets and transportation equipment are all appliances for service provision. What customers want is access to the flow of service that these goods facilitate and not necessarily the output or product that firms produce. It can be argued that the movement from G-D logic to S-D logic is the move from viewing business as focused on things (nouns) to actions and processes (verbs).

A more complete understanding and appreciation of S-D logic requires serious reading of the work of Lusch and Vargo over the last half dozen years (see: http://www.sdlogic.net). However, as an introduction to S-D logic consider that it is woven together with ten foundational premises.

FP1: Service is the fundamental basis of exchange.

FP2: Indirect exchange masks the fundamental basis of exchange.

FP3: Goods are a distribution mechanism for service provision.

FP4: Operant resources are the fundamental source of competitive advantage.

FP5: All economies are service economies.

FP6: The customer is always a cocreator of value.

FP7: The enterprise cannot deliver value, but only offer value propositions.

FP8: A service-centered view is inherently customer oriented and relational.

FP9: All social and economic actors are resource integrators.

FP10: Value is always uniquely and phenomenologically determined by the beneficiary.

Briefly a few elaborations are needed to begin to understand these foundational premises. First it is important to recognize that S-D logic is not antigoods or tangible matter. On the contrary, goods and tangible resources play an important role in S-D logic and that is as appliances in the customer's service-provision "supply chain" (see FP3). It recognizes that when a customer is being supplied with a product that this product enters into some type of value creating process where it is integrated with other resources (FP9) to provide a flow of service. Consequently a major imperative for a supplier is to find better ways to integrate the resources necessary for service provision (Ballantyne and Varey 2008).

A second key concept to understand is that of an operant resource. For most of human history resources were viewed as tangible things that could be drawn on for sustenance or support — perhaps best characterized as natural resources. For instance, this was the view of Malthus (1798) when he studied population growth and projected that humans would soon run out of resources. These resources have a special label in S-D logic and that is "operand resources" or resources that are acted upon (usually by humans). Operand resources are usually tangible and static and where Malthus focused his thinking. On the other hand, operant resources are often intangible and dynamic and act on operand or other "operant resources" to produce effects. Skills, competences, capabilities and knowledge when applied are examples of operant resources. S-D logic views operant resources as the primary source of competitive advantage (FP4).

Finally, it is important to understand value from an S-D logic perspective. G-D logic rests on value being tied to economic exchange. Value in exchange in contemporary society is measured by price or monetary exchange for the product a firm offers and supplies. Thus as firms performed supply chain functions it was thought that they were adding value. S-D logic does not ignore that value in exchange is important for firm survival and growth but focuses more on value in use. It pays special recognition and obtains key insights by examining the value that users obtain from the experience of using a marketplace offering and integrating it with other resources. For this reason the customer or user is always a cocreator of value (FP6), firms can only make value propositions (FP7) and only the user or beneficiary can determine value (FP10).

THE SERVICE ECOSYSTEM

The systems concept is not new to supply chains and in fact integrated business logistics was an early example of systems thinking. Also network thinking is not new to SCM. For instance the concept of a supply chain network structure has been viewed as tiers of suppliers (from first tier or direct interactions to second tier and beyond indirect interactions) and tiers of customers defined similarly (e.g., Lambert, Martha nad Pagh 1998). In these tiers are embedded business processes that are both internal and also linking to other members of the supply chain network. Importantly a business process is itself a service such as billing and collecting, inventory management, transportation routing and scheduling, etc.

S-D logic replaces the concept of a supply chain with a network concept that is referred to as a service ecosystem. A service ecosystem is a spontaneously sensing and responding spatial and temporal structure of largely loosely coupled value proposing social and economic actors interacting through institutions and technology, to: (1) coproduce service offerings, (2) exchange service offerings and (3) cocreate value. A supply chain is nested in the service ecosystem. The concept of a service ecosystem can also be viewed as a value network (Lusch et al. 2010), which may better capture the nesting of supply chains with larger and more encompassing value networks. Many highly structured and rigid supply chains were historically characterized by strong or rigid ties; however, service ecosystems are comprised of primarily weak ties (Granovetter 1973, 1983), which enable seemingly unrelated organizational networks to form a larger macrostructure that can be more fluid, agile and adaptable (Lusch et al. 2010). The service ecosystem concept views actors as making value propositions to each other versus delivering or adding value. It also puts emphasis on the co-production and cocreation that occurs between actors in the service ecosystem and hence has a strong focus on collaborative processes. Institutions and technology are also central. Institutions can include such things as property rights, norms, and monetary systems. A variety of technologies hold service ecosystems together but of foremost importance is information technology, which is discussed below.

INFORMATION TECHNOLOGY AND SYSTEMS

Economic growth has largely been driven by growth in knowledge and information technology (Mokyr 2002). This process began with the development of human language and mechanisms for its transmission such as paper, the printing press, radio, television and the Internet. Information was embedded in physical matter for most of human civilization. Artifacts were essentially frozen ideas or knowledge or what Vargo and Lusch (2004a) refer to as "informed matter"; wheels, gears, chains, pulleys, clocks, were all matter impregnated with human ingenuity, which was used to alter their form to make them resources. Today more and more information can be separated from physical matter due to a host of information technologies centered on the microprocessor and our ability to harness the electromagnetic spectrum for information transmission. Consequently we are witnessing an unprecedented unbundling of information from matter and in the area of SCM, what Clarke (1998) calls "virtual logistics" in which the physical and

information components of supply chain logistics are independent from one another (Lusch et al. 2010).

IT is perhaps the meta-force altering business and society (Brown and Duguid 2000; Benkler 2006), and the practice of SCM. Gunasekaran and Ngai (2004, p. 270) argue that "IT is like a nerve system for SCM" that enables actors to more completely sense and respond to each other. There are seven primary reasons why IT growth enables the expansion of service ecosystems consistent with the principles of S-D logic (Lusch et al. 2010).

1. As information technology increases, goods become embedded with microprocessors and intelligence and become improved platforms for service provision (e.g., digital manufacturing, start/smart parts that embed intelligence, collaborative design through virtual modeling, idea generation through virtual conference rooms and product lifecycle management).
2. As information technology increases, the ability to self-service rises.
3. As information technology increases, the ability to serve others rises.
4. As the ability to communicate increases, the need to transport decreases.
5. As the ability to communicate increases, the ability to know customers and suppliers rises.
6. As the ability to communicate increases, the ability to interact directly with customers and suppliers rises.
7. As the ability to communicate at lower costs increases, coordination between firms becomes more efficient and responsive.

Consequently, if we refer back to the definition of a service ecosystem as a spontaneously sensing and responding spatial and temporal structure of largely loosely coupled value proposing social and economic actors interacting through institutions and technology, to: (1) coproduce service offerings, (2) exchange service offerings and (3) cocreate value it becomes clear that information technology and systems are intertwined with contemporary service ecosystems. IT and IS enable sensing and responding (Haeckel 1999; Butner 2007), interaction over space and time, coproduction of service offerings, exchange platforms for service offerings and the cocreation of value.

RESEARCH FRONTIERS

A variety of research possibilities are opened up when adopting an S-D logic perspective. Five major areas for future SCM research are summarized.

How does one integrate the customer into the supply chain or, stated alternatively, how does one move from viewing the customer as the destination of supply (a *supply to* orientation) to someone to cocreate value with (a *marketing with* orientation)? Research should focus on joining together lean production with lean solutions or lean consumption (Womack and Jones 2005). This is a movement away from viewing the firm as producing outputs and rather viewing it as an input and service, which becomes part of a customer's value creating activity. More needs to be understood about how the customer can help to produce the firm's core offering.

A second major stream of research should address the systemic nature of value creation.

If value is cocreated and not firm created and delivered, and if cocreation involves complex systems and networks rather than dyads or sequential chains, it raises a whole host of research questions related to systemic and synergistic effects (Lusch et al. 2010). How does one measure firm performance but also system performance? How does one deal with conflicting value propositions in the ecosystem? What role does competition versus cooperation play in the service ecosystem? What is the role of public policy in global service ecosystems?

Organizations that are part of the service ecosystem are sensing, responding and learning entities. This presents a third major research opportunity. S-D logic views operant resources as a fundamental source of competitive advantage and many argue that knowledge is the most fundamental operant resource for competitive advantage. Thus it is important to understand the fundamental issue of how organizations sense, respond and learn to become more knowledgeable (grow their stock of knowledge). In this regard it is not enough to have core competences but dynamic capabilities become more central. However, even here it is more and more important to have speed and adaptability. Increasingly it is who learns and implements the quickest.

Can one govern or manage a service ecosystem? This is a fourth area of prime importance for research. Although we know quite a bit about market and hierarchical (firm) governance, we know relatively little about the governance of networks and service ecosystems. A key challenge is that unlike an organization, which can be owned, no one owns a service ecosystem. Within this area of governance a major area that we understand little about is communication systems and this increasingly involves global communication systems. How does a firm communicate with suppliers and customers that are spread around the world and where the cultural meanings of words and institutions are so varied?

Finally there is considerable research opportunity in the area of innovation. All supply chains have many processes that themselves are services. How does one innovate with these processes when they not only cut across the functional areas of the firm but also to other firms and out to a web of firms that are part of a service ecosystem? Clearly the old model where innovation and product development was centralized in the firm is no longer either effective or efficient. With S-D logic, innovation has become open (Chesbrough 2006) and democratized (von Hippel 2005). What is the most effective way to bring suppliers and customers into the innovation process?

A more complete understanding of SCM using the S-D logic lens also has implications for research methods. S-D logic does not assume away the heterogeneity of actors, the nonlinear nature of relationships, system dynamics and evolutionary processes. Although we do not suggest the wholesale abandonment of previous research methods since they can provide some insights, we believe that additional insights can be obtained from methods that can deal with the more realistic assumptions S-D logic makes about social and economic actors. Agent-based modeling (ABM) is one such research tool that is used to create artificial worlds that mimic actual worlds such as the world of a supply chain or a service ecosystem. ABM is a form of artificial life where competing computer programs modeled as objects, as in object-oriented programming, mimic real agents that are part of a system. These agents have a set of rules (genes) that learn and evolve based on genetic algorithms. From their actions and interactions a world is grown from the ground up. Essentially ABM is a Petri dish for growing social and economic worlds. For examples of agent-based modeling see Tay and Lusch (2005, 2007). Another research tool is the rapidly emerging techniques of computational linguistics. Modern science has spent hundreds of years developing statistical methods to analyze numbers, however, now the most common data are words, as in the billions of conversations and communication that characterize Web 2.0. Thus tools are being developed to automatically analyze large textual databases and provide business intelligence for organizations. The underlying theme that is consistent with S-D logic is viewing markets as conversations. For further insights into computational linguistics and markets as conversations see (Chen 2010; Lusch, Liu and Chen 2010). In addition to the growing volume of textual databases there is also a large growth in numerical databases and also the ability to integrate databases that combine a firm's financial data with external factors such as customer and competitor data. Increasingly these large databases are searched for meaningful relationships and patterns using genetic algorithms. For an example of applying genetic algorithms to firm and customer databases to segment markets see Liu, Ram, Lusch and Brusco (2010).

CONCLUDING COMMENT

Although the preceding presented a research agenda, it is quite clear that the answers to these five meta-questions have profound implications for the practice of supply chain management. Imagine the central role that SCM could provide to a firm's overall strategy and performance if: (1) it understood how what it supplies is central to customer value creating processes, (2) it understood how to make competitively compelling value propositions not only for its customers but customers of customers and backward to the firm's suppliers and their suppliers, (3) it understood how it could learn more quickly and then act on this learning to continuously have a knowledge advantage and hence competitive advantage, (4) it could develop a global communication system that allowed for diverse cultures operating around the world to work as an effective team and (5) it knew better how to open its innovation process to all members of the service ecosystem yet protect important property rights. In brief, there is no better managerial tool than a workable theory. S-D logic is rapidly being applied around the world and across industries and thus demonstrating, in the crucible of reality, its workability.

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