(Why we need)
An Operations Paradigm for Services

June 15, 2007

ABSTRACT

Paradigms are fundamental frameworks around which disciplines and schools of thought are established. A survey of research literature shows that the majority of paradigms associated with services management over the past thirty years have come from the marketing discipline and perspective. Some of these paradigms have been recently shown (by marketers) to be invalid. Others can be seen to provide little discriminatory value and thus few unique managerial insights. Further, some of the services marketing paradigms are biased against traditional operations management. Leading researchers from both marketing and operations have been calling for a new service paradigm. This article reviews paradigms from the literature and proposes a customer-supplier services paradigm which is founded in operations perspectives. Benefits and insights coming from the customer-supplier paradigm are described, and the paradigm is empirically shown to be superior to alternative service paradigms. Thus, the customer-supplier paradigm is a useful and justified basis for present and future study of services.

INTRODUCTION

Every field of study is founded on one or more paradigms, which are philosophical or theoretical frameworks. Paradigms define the basic assumptions of
sciences and disciplines. For example, physics has a paradigm of quantum mechanics which proposes that discrete particles possess measurable attributes and exhibit predictable behavior. Quantum mechanics replaced traditional Newtonian mechanics as a foundational paradigm of physics; Newtonian mechanics was found to adequately explain some phenomena but to be inconsistent with others.

Paradigms also provide reasonable scope to fields of study. Some physicists have attempted to devise a “theory of everything” that encompasses all known phenomena (at least all known phenomena pertaining to physics). Although such hyper-generalizations are intellectually appealing, rarely do such ideas develop beyond the stage of imagination.

There have been a number of common paradigms associated with the study of service businesses, primarily coming from services marketing. These paradigms have attempted to answer this fundamental question: If one is studying services, what exactly is being studied? For example, it is common to express a services paradigm in terms of “goods versus services,” which implies that services are different from goods. If so, the question then becomes how they differ, and if those differences impact how they should be managed.

Some have argued that services exist to serve the needs of customers, and recognize that goods can also serve the needs of customers. The conclusion some have espoused is that even goods are services—that everything is a service! (e.g., Gummesson 1995, p. 150; Vargo and Lusch 2004b, p. 334) That conclusion would lead one to believe that the study of services is the study of anything and everything. Such a broad paradigm provides little value in terms of managerial insight. Advancement of a services discipline hinges on a belief that services possess managerial differences from non-services.
The fact is, most service paradigms emerging in the past thirty years have come from the marketing discipline. Although the study of services has benefited greatly from the marketing contribution, that contribution has come with baggage and is somewhat biased against operations perspectives. Some services marketing paradigms have been recently refuted – by none other than luminaries from services marketing. They have issued a resounding call for new services paradigms. This paper proposes value in considering service paradigms based on an operational perspective.

The next section will discuss the concept of paradigms. Subsequent sections will review strengths and weaknesses of common service paradigms, which again primarily come from marketing perspectives. Two service operations paradigms will be presented, including a “customer-supplier” paradigm that integrates services marketing and service operations concerns. One important issue we will address is an appropriate focus of service classification schemes, be it classifying industries, organizations, outputs, or processes. Survey results show that the customer-supplier services paradigm is empirically supported and superior to competing paradigms. Implications of that paradigm will be briefly described with empirical support. A final section summarizes general conclusions.

**WHY WE NEED A PARADIGM**

A paradigm is “a philosophical and theoretical framework of a scientific school or discipline within which theories, laws, and generalizations and the experiments performed in support of them are formulated” (Merriam-Webster 2006). Paradigms form the basis of scientific schools or disciplines. There has been some debate in recent years about the formation of a service *science*, largely attributed to IBM’s establishment of a
research center for Services Sciences, Management and Engineering (IBM 2006). For the present we will be satisfied if services can be justified as a “discipline.”

Thomas Kuhn, one of the leading scientific philosophers of the past century, describes paradigms as assumptions shared by members of a given discipline (1970). Thus, an additional element of paradigms is their general acceptance, and a valued characteristic of new paradigms is their fit within other principles espoused by a given academic cohort. This does not preclude the possibility of “paradigm shifts,” in which a new paradigm pulls followers away from prior paradigms.

Paradigms are not only foundational to disciplines, but are useful because they direct the activities within disciplines. As stated by Lovelock and Gummesson, “A paradigm shapes the formulation of theoretical generalizations, focuses data gathering, and influences the selection of research procedures and projects” (2004, p. 21). A truly useful paradigm will also have practical implications, such as leading to significant managerial insights.

A “good” services paradigm will need to be foundational, encapsulate common assumptions, and help specify advancement activities. At a minimum, a services paradigm should help those studying services decide what a service is and how services are distinct from “non-services.”

**SERVICE PARADIGMS FROM RESEARCH LITERATURE**

This section will outline service paradigms (SPs) which have been assumed over the years as discussed in the literature, including some potential counterarguments. The first and most naïve services paradigm is not founded upon what services are, but rather what they are not.
**SP₁ (residual): Services are economic activities not accounted for by other sectors of the economy.**

The “other sectors” generally include agriculture, mining, manufacturing, and in some cases construction and utilities (Castells and Aoyama 1994). This services paradigm has been largely perpetuated by government classification schemes (Schmenner 1995), but also by academics (Morey 1976). In 1934, the US Interdepartmental Conference on Industrial Classification recommended the development of a system for standard industrial classification (SIC) (Pearce 1957). The original SIC specification came in two volumes, one for “manufacturing industries” and the other for “nonmanufacturing industries” (including services).

The question remained of whether there was any managerial significance involved in the classification of manufacturing and nonmanufacturing industries. Manufacturing industries have many management challenges in common—inventory management, identifying production bottlenecks, and so forth. However, even recent industrial classification schemes acknowledge that services cover a “wide variety” of industries, with no clear indication of common managerial issues (US.Census.Bureau 1992).

An early research article alluding to the possibility of some coherence in a residual definition of services was published by Morey (1976). He studied the operations of three “nonmanufacturing organizations,” a hospital, a university, and a retail firm. He concluded that “operations management in the three types of organizations studied is significantly different from the operations management in a manufacturing organization, as taught in traditional production courses” (p. 123).

Regardless of any managerial relevance coming from SP₁, the logic of a residual service paradigm is lacking in that it does not tell us what services are, but simply what
they are not (Castells and Aoyama 1994). A residual paradigm is negative in that it
provides a definition by exclusion. Judd asserts that definitions by exclusion are
inherently defective, in that “from the definition itself, nothing can be learned about what
are the essential characteristics of a service” (1964, p. 59).

Judd directs that statement at his own early candidate service paradigm, namely:

**SP<sub>2</sub> (non-ownership): Services are transactions wherein the object of the
transaction is other than the transfer of ownership of a tangible commodity.**

This service paradigm is more specific than SP<sub>1</sub> in that it enumerates two
conditions of exclusion: transfer of ownership and the involvement of a tangible
commodity. A counterargument is that SP<sub>2</sub> categorize business activities in ways which
are inconsistent with common beliefs about how services behave. According to SP<sub>2</sub>
public radio broadcasting and the production of prepackaged software would be services,
even though they do not exhibit commonly held managerial characteristics of services
(discussed in the penultimate section). SP<sub>2</sub> would exclude services involving the
transformation of tangible items from being services, including restaurants, home
painting, and plastic surgery. Even Judd (1964) points out that, as a definition by
exclusion, SP<sub>2</sub> is inherently defective.

Another early services paradigm was espoused by Rathmell, who juxtaposed
goods and services, declaring that “a good is a thing, and a service is an act” (1966, p.
33). This view has been reemphasized by others, who refer to services as deeds,
processes, and personal performances (Berry 1980; Levitt 1972; Lovelock 2001;
Zeithaml, Bitner, and Gremler 2006). A variation on that theme is that services are
products that are processes (Henkoff 1994; Shostack 1987). These service paradigms are
summarized as follows:
**SP₃ (act/performance): Services are acts performed by one entity for another entity.**

Such a paradigm makes intuitive sense, and we are unlikely to find a counterexample. Instead, the counterargument to SP₃ is that it does not differentiate services, but may be considered to apply equally as well to non-services such as pure manufacturing. A person would have to be completely naïve to assume that made-to-stock manufacturing (a non-service) is other than an act performed by one entity for another entity. The fact that end consumers cannot observe the manufacturing process does not diminish the fact that manufacturing acts are being performed. Therefore, SP₃ would lead us to believe that every business is a service, and thus SP₃ provides no discriminative value.

Another popular service paradigm focuses on the intangible nature of services. Pearce calls services “intangible goods” (1981, p. 390), which idea has been echoed by others (e.g., Bannock, Baxter, and Reese 1982, p. 372; Murdick, Render, and Russell 1990):

**SP₄ (intangible): Services are intangible products.**

Although tangibility-intangibility can be treated as dichotomous, it is commonly accepted that it exists on a continuum (Shostack 1977; Zeithaml, *et al.* 2006). SP₄ has been widely quoted over the years, but has recently fallen into disfavor. Laroche, Bergeron, and Goutaland empirically studied a wide variety of business products including compact disks, pizza dinners, and checking accounts, and conclude that “some goods appear to be less tangible than many services” (2001, p. 26).

In their award-winning article, Lovelock and Gummesson further discredit the intangibility paradigm of services. They observe that intangibility is “the most widely
cited difference between goods and services” (2004, p. 25). They consider two main
types of intangibility: physical intangibility (immaterial) and mental intangibility
(difficult to conceptualize). They point out that although it can be difficult to
conceptualize services prior to purchase, the same is also true of numerous manufactured
products. They describe how *servicescapes* and other physical elements make services
quite physical and tangible (Bitner 1992). In addition to physical facilities, many if not
most services include tangible *facilitating goods* (such as paper, auto parts, and medical
supplies) that allow the service delivery and are often purchased by service customers
(Fitzsimmons and Fitzsimmons 2006, p. 20). In summary, Lovelock and Gummesson
conclude that intangibility “is not a universally applicable characteristic of all services”
(2004, p. 27), which conclusion has been echoed by others (Laroche, *et al.* 2001; Vargo
and Lusch 2004b).

Lovelock’s and Gummesson’s criticism of the intangibility paradigm is imbedded
in criticism of “the current core paradigm of services marketing, namely, the assertion
that four specific characteristics—intangibility, heterogeneity, inseparability, and
perishability—make services uniquely different from goods” (2004, p. 21). These four
characteristics are collectively referred to as IHIP, with common definitions as follows
(Fitzsimmons and Fitzsimmons 2006; Merriam-Webster 2006; Zeithaml, *et al.* 2006):

- **intangibility**—incapable of being perceived, especially by the perception of
touch (physical intangibility and mental intangibility described above).
- **heterogeneity**—unique products (or possibly unique processes).
- **inseparability** (also called “simultaneity” or “simultaneous production and
consumption”)—consumed at the point of production.
perishability—discussed in two dimensions: (1) perishable products, meaning that the process output provides customer benefits for a limited duration, and (2) perishable capacity, in that capacity without corresponding demand cannot be utilized to meet future demand.

A detailed literature review by Fisk, et al. concluded that, at least at the time of their article, IHIP “provided the underpinnings for the case that services marketing is a field distinct from goods marketing” (1993). That core paradigm is restated as follows:

**SP₅:** Services are characterized by IHIP, and non-services are not characterized by IHIP.

We have already considered disputations concerning intangibility. Lovelock and Gummesson make compelling counterarguments against the definitiveness of each of the IHIP characteristics. They conclude “As a paradigm, the notion that the four IHIP characteristics make services uniquely different from goods is deeply flawed” (Lovelock and Gummesson 2004, p. 32).

Lovelock and Gummesson emphasize that there are many exceptions to SP₅. Indeed, IHIP provides some unusual classification of services and non-services. Heterogeneity classifies art painting as a service, even if the painter is far removed from the consumer, and classifies standardized quick oil change services as non-services. Inseparability classifies electric generation (i.e., manufacturing electricity) as a service, and some services that provide for future consumption—such as dry cleaning and retirement fund management—as non-services. Perishability would render newspaper printing as a service (you cannot print future editions), with executive recruiting as a non-service (since executives can be recruited for future job openings).
At about the same time as the Lovelock and Gummesson article, Vargo and Lusch published an article on IHIP titled “The Four Service Marketing Myths,” wherein they conclude that IHIP “(a) do not distinguish goods from services, (b) only have meaning from a manufacturing perspective, and (c) imply inappropriate normative strategies” (2004b, p. 324).

The sentiment against IHIP appears to be gaining ground. Grove, et al. surveyed ten services experts and make the following observation: “Some believe that the field [of services marketing] has been too preoccupied with minor refinements and argue that bold change is needed. Perhaps the most provocative comments in this respect are the call to drop the four characteristics [IHIP] that are commonly used to distinguish services from goods [marketing]” (Grove, Fisk, and John 2003, p. 112). One of the experts called IHIP a “misrepresentation” and another declared IHIP to be “service mythology” (Grove, et al. 2003, p. 115).

**SKEPTICISM AND THE NEED FOR A NEW PARADIGM**

Lovelock and Gummesson begin their article with the query, “Is the academic field of services marketing in danger of losing its broad and in many respects coherent perspective?” (2004, p. 20). This skepticism is based on their analysis and conclusion that “the underlying premises of [the IHIP] paradigm no longer bear up under examination” (p. 37).

This skepticism about prior service paradigms has been echoed by others. Edvardsson, Gustafsson, and Roos surveyed eleven top service researchers and conclude that “on lower abstraction levels a general service definition does not exist. It has to be determined at a specific time, in a specific company, for a specific service, from a specific perspective” (2005, p. 119). Vargo and Lusch seem to make the same conclusion
and declare, “We advocate that the strategy of differentiating services from goods should be abandoned…” (2004b, p. 334).

The experts surveyed by Grove, et al. also revealed “a call to eliminate the goods versus services distinction altogether” (2003, p. 113). Eliminating the goods versus services distinction could have serious ramifications. For example, it would likely undermine the establishment and progress of a cross-functional services discipline since traditional non-service approaches to functional disciplines would likely be adequate for the study of services. Johnston (2005) argues that the retreat of services back into traditional functional areas has already begun. Even though he contends that this digression might have some benefits, it would be unfortunate if the cross-functional study of services were to abate.

There are various ways of addressing this services management identity crisis. Lovelock and Gummesson point out that “one option is to argue that that services marketing and goods marketing should be reunited under a service banner,” which is the position taken by Vargo and Lusch (2004a; 2004b). Absorbing the study of services into marketing and other functional areas would undermine the valued attempts at cross-functional development.

A second option presented by Lovelock and Gummesson is to recognize that manufacturing and service enterprises possess managerial differences, but to also accept that “the differences among services are equally significant and must be acknowledged by developing separate paradigms for different categories of services” (2004, p. 37). That would seem to say that the general categorization of “services” is relatively meaningless and arbitrary. It would leave us with a fragmented services discipline based on a bunch of industry-specific paradigms.
The third alternative presented by Lovelock and Gummesson is “to look for a new paradigm that would cut across the traditional goods and services dichotomy.” A survey of service experts by Grove, et al. also revealed a recommendation to “entertain a paradigm shift to introduce new perspectives [of services]” (Grove, et al. 2003, p. 113). This supposes that the problem may not be with the managerial distinctiveness of services, but rather with the paradigm used to articulate the distinctiveness. This alternative is to develop a new and more valid services paradigm.

Lovelock and Gummesson pursue this third alternative by presenting a “potential basis for a new paradigm,” namely “nonownership.” They posit that “transactions that do not involve a transfer of ownership are distinctively different from those that do” (2004, p. 34). They contend that services “involve a form of rental or access in which customers obtain benefits by gaining the right to use physical objects, to hire the labor and expertise of personnel, or to obtain access to facilities and networks” (p. 34). This paradigm is summarized as follows: (Lovelock and Gummesson 2004, p. 20)

\[ SP_6 \textit{(rental/access): “Services offer benefits through access or temporary possession, instead of ownership.”} \]

This is an intriguing paradigm, although it is not completely new. \( SP_2 \) presented by Judd (1964) emphasized the importance of transfer of ownership in distinguishing goods from services, and Rathmell stated “If a product is purchased, it is a good; but if it is rented or leased, the rentee or lessee acquires a service” (1966, p. 34). Lovelock and Gummesson acknowledge this history, but point out that non-ownership has since been largely overlooked as a characteristic of services.

They point out various implications of the rental/access paradigm, including (1) manufactured goods can form the basis for services, (2) services involve selling slices of
large physical entities, (3) labor and expertise are renewable resources in services, (4) time plays a central role in most services, and so forth. It is presented as an alternative paradigm, but not necessarily the paradigm. Lovelock and Gummesson “do not claim that it offers a panacea with necessarily general properties,” but offer the rental/access paradigm as a “lens to present aspects not clearly visible in current theory” (2004, p. 34). Of course, a services management panacea would be nice.

The rental/access paradigm has interesting implications with regard to self-service. Lovelock and Gummesson discuss how customers might self-serve by renting items such as vehicles, tents, power tools, and furniture (2004, p. 35). However, an alternative is to take ownership of such items and provide self-service, which self-service use of items might be about the same as if the items were rented. Other authors have argued that physical goods act as self-service providers, even if the customer enjoys the benefits of ownership (Sampson 2001, p. 148; Vargo and Lusch 2004a, p. 8).

As with other service paradigms, the rental/access paradigm provides for some interesting categorizations. Music composition would be classified as a service, since consumers own the right to listen to the music but not the music itself. Highway construction is also a service, since highway users simply use the output (although some people drive like they own the road, even though they do not). Restaurants provide access to facilities, but provide ownership of the food items, and thus might not be services. Auto dealerships are interesting—if the sales process ends with the customer signing a lease then it would be a service but if the customer purchases a vehicle then perhaps it would not be a service. One might wonder if, other than tax implications, the difference between leasing and purchasing is not that great.
Another contemporary direction of thinking in services is Vargo and Lusch’s “Service Dominant (S-D) logic for marketing” (2004a). Their ideas have generated a tremendous amount of academic discussion within the marketing and services marketing literature (Lusch and Vargo 2006). Their premise was originally founded upon eight fundamental propositions, including “the customer is always a coproducer” (of goods or services) and “the enterprise can only make value propositions” (but enterprises do not create value themselves).

S-D logic defines services as “the application of specialized competences (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself,” which is quite similar to SP3 (act/performance) while focusing on “specialized competencies.” As with SP3, it would be difficult to identify any firms, service or otherwise, that fail to meet such a broad definition. That broadness is consistent with Vargo and Lusch’s assertion that all economies are service economies.

**MARKETING VERSUS OPERATIONS PERSPECTIVES**

It is interesting to note that almost every one of the references cited to this point come from the marketing discipline, including the criticisms of past and present paradigms. The fact is that the establishment of a distinct study of services is primarily attributed to researchers from the marketing discipline. This is poignantly emphasized by the number of times the general field of services management is referred to as “services marketing,” even when referring to operational topics such as quality management or process design.

Further, the service paradigms as discussed above largely come from the marketing perspective, which is a consumption perspective (Edvardsson, et al. 2005; Gummesson 1995, p. 250). Rust (2004) asserts that the services marketing perspective
focuses on understanding and serving customers, whereas the service operations
perspective focuses on the design of service delivery systems. The distinction of
marketing and operations in services can be somewhat convoluted, and the perspectives
possess their own inherited biases.

We might suppose that services marketing paradigms focus on what is provided to
customers and how the customer receives benefits from the service, and that service
operations paradigms focus on how services are produced. Note that SP₂ through SP₆
largely emphasize distinctions that are primarily relevant and observable to customers.

- SP₁ (residual) is neither a marketing nor an operations paradigm, and does not
  say anything about the nature of services.
- SP₂ (non-ownership) says that service customers do not receive ownership of
  anything tangible. It does not say how the intangible thing is produced.
- SP₃ (act/performance) says that service customers receive an act. For
  manufacturing, customers receive a tangible item (which is created by the act
  of manufacturing).
- SP₄ (intangibility) says that it is difficult for customers to physically touch or
  mentally conceptualize the output of services. That does not necessarily imply
  that the production of services is intangible.
- SP₅ (IHIP) says that service customers receive unique products at the time
  they are produced, and that the benefit may or may not last. The production
  process may also be unique, and the timing of production is tied to the timing
  of demand, implying that SP₅ is partially a service operations paradigm.
• SP₆ (rental/access), like SP₂, says that customers receive benefits by accessing services, without the need for possession utility. Service providers give access to the service, but SP₆ does not tell how that access is provided.

The consumption perspective is important and valuable, but it may contribute to some of the SP confusion. The following are three significant problems with paradigms based on the consumption perspectives.

1. Some service marketing paradigms promote false ideas.

For example, consumers perceive that services are acts but do not perceive the acts of made-to-stock manufacturing, leading to a false conclusion that being an act is a distinguishing characteristic of services. The intangibility of services is also a product of customer perception—customers can observe their automobile being repainted at an auto painting service and consider the painting process to be intangible, but if they purchase a painted car coming from an overseas factory they consider the paint simply a tangible element of the car (and never perceive the process).

2. Some service marketing paradigms provide little or no discriminatory value.

Advocates of service marketing have done much to promote the significance of services in world economies, and sometimes this is taken to a great extreme. In particular, some of the leading service marketing researchers espouse the idea that everything is a service, and that even goods are services (e.g., Gummesson 1995, p. 150; Vargo and Lusch 2004b, p. 334). Although it is logical to recognize the service value of physical goods, it is naïve to assume that the production of physical goods is similar to the production of services. If everything truly were a service then the study of services would probably have been fully absorbed into traditional disciplines.
3. Some service marketing paradigms are biased against traditional operations perspectives.

Some consumption paradigms gloss over or ignore the value of traditional non-service operations. For example, S-D logic states that “the purpose of the firm is not to make and sell units of output but to provide customized services to customers and other organizations,” and “investment in manufacturing technologies constrains market responsiveness,” and “firms will increasingly become more competitive by outsourcing the manufacturing function” (Vargo and Lusch 2004a, p. 13). Instead, S-D logic “implies that the goal [of firms] is to customize offerings,… and to strive to maximize customer involvement in the customization to better fit his or her needs” (p. 12). (Commodity manufacturers are likely to disagree with this.)

S-D logic is notably marketing-centric, asserting that “Ultimately, the most successful organizations might be those whose core competence is marketing and all its related market-sensing processes” (p. 13), and that “marketing should lead the effort of designing and building cross-functional business processes” (p. 14). Few would disagree with the importance of marketing functions of firms, although researchers from operations might not agree that marketing is or should be the universal focal point of all firms. Admittedly, it is the “S-D logic for marketing” even though it has gained some ground as a general service paradigm.

Fortunately, the service marketers are not only calling for new paradigms of services, but they are also at least willing to pay lip service to involving operations and other disciplines in the effort (Grove, et al. 2003, p. 113; Lovelock and Gummesson 2004, p. 22; Rust 2004, p. 211). Marketing academics have assumed leadership in
advancing the services discipline, and may be demonstrating further leadership in looking outside of their field for new perspectives.

Could it be that the field of operations management can assist in deriving new service paradigms? Could it be that prior service paradigms are limited by having too much reliance on the marketing perspective, and that operations management might provide the “fresh perspective” sought by Lovelock and Gummesson (2004) and others?

Despite the leadership of services marketing researchers, operations management researchers have not been idly sitting on the sidelines during the development of the services discipline. In fact, service operations management researchers published a call for a new paradigm of services that predates the call-for-a-new-paradigm articles cited above that came from services marketing. In 1999, Nie and Kellogg published findings from a survey of 167 operations management professors which concluded that “Service OM researchers must develop a new paradigm. This should be built on, and clearly articulate, the fundamental differences between managing service operations and managing manufacturing operations” (1999, p. 351).

**SERVICE PARADIGMS FROM OPERATIONS**

Arguably, the preeminent service operations paradigm is the customer contact model that was introduced by Chase some time ago (1978; 1981; Chase and Tansik 1983; Wemmerlöv 1990, p. 21). Chase calls services involving a high degree of customer contact “pure services” and those with a low degree of customer contact “quasimaneufacturing.” One might suppose that processes involving no customer contact whatsoever would be “pure manufacturing.”
Chase’s fundamental argument is that the potential operating efficiency of services is limited by the amount of customer contact with service employees. In fact, Chase goes so far as to prescribe the famous equation:

\[
\text{potential operating efficiency} = f\left(1 - \frac{\text{customer contact time}}{\text{service creation time}}\right)
\]

In the original recitation, customer contact was defined as “the physical presence of the customer in the service system” (Chase 1978, p. 138). Although he did not call it a paradigm at the time, Chase’s ideas can be stated as a services paradigm as follows:

**SP, (customer contact): Services are production processes involving customer contact.**

SP, is a service operations paradigm in that it describes what service providers do (they operate under conditions of customer contact). One might assume that it is also a services marketing paradigm, since it does describe customer involvement (through contact); however, with the exception of perhaps psychotherapy, the service value proposition is not in the contact itself, but a result of the contact. In most services, the contact is necessary to receive the service, but not sufficient to motivate customers. For example, we might assume that only the loneliest people go to banks simply to be there and interact with employees—everyone else requires banking transactions.

The customer contact model is useful as a service paradigm because it differentiates services from non-services and because it leads to numerous managerial issues for studying. In particular, Chase proposes that operations with high amounts of customer contact should be managed differently from those involving little or no
customer contact, covering areas such as facility location and layout, capacity planning, worker skills, production scheduling, and quality control (Chase 1978).

One potential weakness of the customer contact paradigm has been that it focuses on customer presence in the service system and fails to consider what customers are doing within the system. Mersha (1990) addressed this concern by revising the definition of customer contact to differentiate between “active contact” (direct customer contact that involves interaction) and “passive contact” (direct contact that does not involve interaction, such as riding a bus). Mersha asserts that active contact is what drives potential operating efficiency of services. Mersha allows for remote services involving direct customer contact without requiring customers to be physically present. Remote services that are mediated by technology have been more recently studied by Froehle and Roth (2004).

Subsequent to Mersha’s work, Kellogg and Chase (1995) developed a scale of customer contact encompassing three dimensions: (a) total amount of time customers spend communicating in the production system, (b) the richness of the information being exchanged, and (c) the amount of confiding and trust shared between customers and employees. This scale again demonstrates that customer contact occurs in degrees.

Even an expanded definition of customer contact may fail to capture the variety of processes that might be considered “services.” Some time ago, Lovelock (1983) categorized services into four categories:

- services directed at people’s bodies (e.g., health care, passenger transportation, beauty salons),
- services directed at people’s minds (e.g., education, information services, and theaters),
• services directed at people’s belongings (e.g., freight transportation, repair services, dry cleaning, landscaping), and

• services directed at people’s intangible assets (e.g., banking, legal services, accounting).

The first two service categories certainly involve customer contact. Services in the latter two categories may involve very little customer contact, yet they strongly exhibit characteristics considered unique to services. For example, auto repair would be classified as a low-contact service according to prior definitions of customer contact. One might think that auto repair thus has high potential operating efficiency, which is not the case (largely due to the uniqueness of each auto problem). Other operational issues would lead us to believe that auto repair is closer to a “pure service” than to “quasimanufacturing.”

A business service example is financial statement auditing, which is directed at tangible and intangible assets of concern to clients. A typical financial auditing engagement involves only a limited amount of interaction with clients. The majority of the billable hours usually involve processing and analyzing information provided by clients, often at a location removed from the client. The financial auditing process continues to demonstrate a relatively low potential operating efficiency, often consuming a great amount of time at large expense, even though the process has a relatively low portion of customer contact.

The next section will present a different paradigm for services that is operationally based and more general than the customer contact model. The paradigm is not focused on what customers get from a service provider nor on what customers
experience with a service provider. Instead, it focuses on what customers give to the service provider. We call it the customer-supplier paradigm.

**THE CUSTOMER-SUPPLIER PARADIGM**

Arguably, the central principle of the operations management discipline is the I/O model: inputs are transformed into outputs through production processes (as depicted in Figure 1). This model is universal—all processes can be described in terms of the I/O model. The model applies to service processes just as well as non-service processes, but the application to service processes is universally distinct from the application to non-service processes.

**Figure 1:** Non-Service I/O Model (e.g., make-to-stock manufacturing)

The customer-supplier paradigm focuses not on what customers do, per se, but on what customers provide as inputs to service processes:

**SP₈ (customer-supplier): Services are production processes wherein each customer supplies one or more input components for that customer’s unit of production.**

SP₈ asserts that the universally distinguishing feature of services is the involvement of customers in production processes by involving inputs that are supplied by customers. As indicated by Lovelock (1983), customer inputs include customers’ selves, their belongings, and/or their information. Customers are therefore suppliers to service processes, as depicted in Figure 2. The customer-supplier service paradigm holds
that customer inputs are a necessary and sufficient condition for a service process to be a service process, and the lack of customer inputs characterizes all non-service processes. SP₈ has broad managerial significance: processes that involve customer inputs possess management concerns similar to one another, but involve different concerns from processes not dependent upon customer inputs.

**Figure 2: Service I/O Model**

In order to understand the customer-supplier services paradigm, a few definitions are in order: inputs, customers, and production processes. As used in SP₈, *inputs* are components of production that come into the process to enable production, not comments or feedback about production in general (i.e., not general “customer input”). *Customers* are individuals or entities who determine if the organization shall be compensated (or rewarded) for production, which may be consumers or may just be decision makers. *Production processes* are sequences of steps that add value and thus warrant compensation. Details and examples of these essential terms are described in (Sampson and Froehle 2006), where the paradigm is referred to as the Unified Services Theory (UST).

**Distinction from Co-Production**

The customer-supplier services paradigm is related to yet distinct from the well-studied concept of customer “co-production.” In the services literature, customer co-production is defined in various ways including “buyer-seller social interaction”
(Wikstrom 1996, p. 10), customers serving as “partial employees” (Mills and Morris 1986), and customer “effort… before, during, and after” service encounters (Youngdahl, et al. 2003, p. 109). Generally, co-production refers to actions or efforts performed by customers.

There exists a possibility that the action of providing component inputs might be considered a special case of co-production, or that customer effort is a special case of component inputs. Indeed, Larsson and Bowen (1989, p. 217) extend Lovelock’s list of selves/belongings/information customer inputs by adding customer “actions participating in the service production”. However, for clarity we distinguish between customer action (i.e., co-production labor) and supplying component inputs (customers’ selves, belongings and/or information).

This delineation between component suppliers and labor is clearer under traditional manufacturing. The usual contribution of “suppliers” to the production process is the provision of components such as raw materials or parts. Labor does not normally provide component materials or parts, but provides effort. The concept of co-production identifies customers as effort-providing actors, whereas SP₈ identifies customers’ selves/belongings/information as things to be acted upon. SP₈ defines services as production processes acting on customers’ selves/belongings/information regardless of whether or not the customer is participating in the execution of the action.

That having been said, it is difficult to imagine a situation where customers are co-producers in a narrow sense (actors in production) but otherwise do not provide any self/belonging/information inputs to be acted upon. The closest example the author can imagine is the production process of a local cannery that produces canned goods for the poor and needy. Should the cannery be classified as a service? The cannery is primarily
staffed by volunteer labor, which may or may not be the consumers of the resulting canned goods. The process appears to be a non-service manufacturing process, even when staffed by needy volunteers. For one thing, staffing and production does not appear to be based on demand or even forecasted demand, but based on the arrival of food raw materials. Yet, many individuals volunteer for mental and spiritual benefits, so from their perspective the cannery is providing a service.

Customer actions outside of production have also been called co-production (Chervonnaya 2003; Kellogg, Youngdahl, and Bowen 1997; Youngdahl, et al. 2003). With the exception of providing inputs, customer actions before and after production are not unique to services, but occur with all types of processes (Lengnick-Hall 1996, p. 802; Lovelock and Gummesson 2004, p. 26). Customers save money and do product research to prepare to purchase manufactured goods (or services). After production, consumers extract value from products that came from production, be it service or non-service production. This post-production consumer action is at the center of arguments that everything is a service (Vargo and Lusch 2004b). Although the broad use of “co-production” as a defining characteristic of services is precarious, a narrow view (see Lovelock and Gummesson 2004, p. 29) has merit.

One challenge with including even a narrow view of customer co-production in the set of customer inputs is the impact on process analysis. A useful way of analyzing any production process is assessing how inputs are transformed into desired outputs (Chase and Aquilano 1995, p. 6). Production processes are value adding processes, as compared with consumption processes which are value extracting (Merriam-Webster 2006). SP8 implies that services are production processes which add value to customer inputs – transforms their bodies, minds, belongings, or information into something of
greater value to the customer. Those customer inputs are what Constantin and Lusch call
*operand resources*, defined as “resources on which an operation or act is performed to
produce an effect” (Vargo and Lusch 2004a, p. 2). Labor, on the other hand, is an
example of an *operant resource*, “which [is a resources] employed to act on operand
resources (and other operant resources).” Arguably, customers patronize services to have
their operand resources transformed in a value-adding way. Their operant resource, i.e.
their co-productive labor effort, is consumed during service production; customers would
be unlikely to pay for the expenditure of their labor operant resource were it not for the
fact that value is simultaneously being added to their operand resources.

**Clarification through a Process Paradigm**

The concept of services being reliant upon customer inputs is not new, but has
been cited in passing in research literature and other publications (Bitner, *et al.* 1997, p.
195; Chervonnaya 2003, p. 335; Fitzsimmons and Fitzsimmons 2004, p. 21; Lovelock
However, the central, defining power of the concept has not been widely recognized. One
reason for this might be that various researchers tend to categorize firms or industries, not
individual processes within firms (Wemmerlöv 1990, p. 24).

The paradigm shift provided by the customer-supplier services paradigm is this:
Customer inputs are the defining feature of services *as long as we identify the customer
and specify the process being analyzed*. The paradigm is a process perspective: All
businesses, services or otherwise, are composed of processes that transform inputs into
outputs. The customer-supplier paradigm proposes that the one *core* factor which
distinguishes traditional make-to-stock manufacturing\textsuperscript{1} from services is not the occurrence of processes nor the process outputs, but the process inputs. The nature of the acts differ, as does the nature of the output, but that is primarily due to the nature of the inputs—customer inputs lead to processes and outputs that are distinct in character from those devoid of customer inputs.

Consider the example given by Rathmell in his 1966 article “What is Meant by Services?” As mentioned, Rathmell follows the phrase “a good is a thing and a service is an act” with the statement, “If a product is purchased, it is a good; but if it is rented or leased, the rentee or lessee acquires a service” (pp. 33–34). The customer-supplier services paradigm perspective would say that a product is a good (i.e., a thing) \textit{regardless of whether it is purchased or rented}. Customers observe the goods rental process, but rarely observe the goods manufacturing processes. If a manufacturing process does not involve customer inputs yet the rental process does, then the rental process, as a service process, will in all likelihood be less efficient than the manufacturing process, will be subject to greater variability, will experience lower utilization, and so forth. Service processes and outputs \textit{are} fundamentally different from non-service processes and outputs due to the dependence upon customer inputs.

Therefore, one part of the existing confusion over terms comes from comparing service \textit{processes} (acts) to manufacturing \textit{outputs} (goods). The process of home construction is an act, whether it is building large quantities of tract homes for future sales or building a one-of-a-kind custom home for a meticulous client. The output of car manufacturing, car sales, car repair, and car rental is all cars. The distinguishing question

\textsuperscript{1}SP\textsubscript{3} classifies traditional make-to-stock manufacturing a non-service when it is accomplished without inputs from customers. Custom manufacturing requires at least an information input from customers, therefore would be categorized as a service. For more explanation, see (Sampson and Froehle 2006, p. 336) or (Sampson 2001, p. 142).
of SPs is, “What are the customer inputs to the given process?” Those processes without customer inputs are very different from those involving customer inputs, and the degree and nature of customer inputs provide further insights.

Another form of confusion comes from studying processes that are complex aggregations of service and non-service processes. As mentioned above, attempting to classify entire companies as either service companies or non-service companies can lead to confusion. Even defining a particular line of business can become convoluted. One might ask “Is a restaurant a service?” A restaurant is a business, not a process. You need to indicate which restaurant process you are considering in order to identify if it is a service process. The process of a chef designing new food offerings is not normally dependent upon customer inputs (other than a consideration of general customer opinions) and is not a service process—unless it is outsourced, in which case the restaurant is the customer of the outsource provider. The same is similar for the supply-procurement process. Seating customers and taking customer orders requires customer inputs, and is a service process. Preparing food for customers is a “back-office” service process, as is preparing the check. Restaurants involve goods, and involve both service and non-service processes.

Service Supply Chains

The other important key to comprehending the customer-supplier services paradigm is realizing that rarely do processes occur in isolation. Rather, processes exist in supply chains, wherein one process feeds another process. The field of operations management approached a renaissance in recent years with the realization that analyzing and managing a given process without consideration for “upstream” supplier processes or “downstream” customer processes leads to suboptimal decisions. The field (or sub-field
or meta-field) of Supply Chain Management is primarily concerned with understanding interactions between such interrelated processes.

As Ellram, Tate, and Billington point out, the representation of services in Supply Chain Management literature is sparse and inadequate (2004). Some writers claim that supply chain concepts are relevant to manufacturing and services, but then proceed to focus on manufacturing examples. The service examples tend to be appendages to manufacturing supply chains, such as retail. Some services have major goods components, and thus benefit from approaches such as supplier certification and selection, synchronous production, and supplier integration. It is not at all clear how to apply such approaches to services that do not have major goods components.

The customer-supplier services paradigm clarifies service supply chains by showing how they involve customers both as suppliers of inputs and consumers of outputs (Sampson 2001, p. 135). Such supply chains are not conveniently linear, but are bidirectional (see Figure 2 and Sampson 2000). The most effective supply chain management for services will involve understanding the function, capabilities, and disposition of customers as suppliers. Just as manufacturing supply chains benefit when suppliers operate in harmony with the given firm, so service firms benefit when customer-suppliers act in harmony with the firm.

**Integration of Operations and Marketing Perspectives**

Although the customer-supplier paradigm originates from the operations perspective, it is easily reconciled with marketing perspectives, considering that the offering presented to customers by service providers is a transformation of something that was previously possessed by the customers (selves, belongings, or information). Thus, interaction with service customers begins before production (customers providing inputs),
often continues during production, and culminates after production. This is consistent with Lusch and Vargo’s (2006) idea that traditional manufacturing firms “market to” customers, whereas service firms “market with” customers.

It is valuable to note that services marketing paradigms can be directly explained by customer inputs. The perception of non-ownership (SP₂) occurs because customers own their inputs before service delivery, and own their inputs after delivery, thus reducing the occurrence of transfer of ownership. Services and non-services are both acts (SP₃), but since customers provide inputs to service processes they observe the acts but when customers do not provide inputs (e.g., for manufacturing processes) they rarely observe the acts. (SP₃ would be better stated “services are customer observable acts….”) In order for customers to provide inputs to service processes they need access to the service processes, facilities, and good (SP₆). Even the customer contact (SP₇) paradigm can be described in terms of customer inputs motivating customer contact. (SP₈ has also been called the “customer-content” paradigm, as an expansion of the customer contact theme.)

The customer-supplier paradigm differs from the S-D logic of marketing in that the customer-supplier paradigm upholds traditional make-to-stock manufacturing. The customer-supplier paradigm does not propose any dramatic changes in the way manufactured products should be produced or marketed, as long as products are appropriately designed for use by service providers or self-serving customers (Sampson 2001, p. 148). Producing commodity products like socks and light bulbs generally involves no customer inputs, and we expect that traditional mass production, mass marketing, and mass merchandising will be appropriate for the foreseeable future.
Despite differences in focus and emphasis, the customer-supplier paradigm holds potential for integrating different perspectives on services. The paradigm simultaneously focuses on the customer (who provides inputs) and on the production process. The paradigm also directly relates to human resource management, since dealing with customer inputs has major implications for job design, employee motivation, human resource development, and other HR issues (Sampson 2001, Unit 8). Even accounting is impacted by customer inputs: production which is dependent upon customer inputs usually has much lower utilization of plant and equipment than manufacturing, making activity-based costing precarious for services. The customer-supplier paradigm leads to a cross-functional study of services, and provides a point of common interest for various perspectives pertaining to services.

EMPIRICAL EVIDENCE

As mentioned previously, one characteristic of paradigms is their general acceptance by some group at some point in time (Kuhn 1970). An empirical research question of interest is how the various service paradigms hold up relative to the reasoning of study subjects from some relevant population. We might have surveyed faculty perceptions of paradigms, but suspect that would just confirm their biases based on unsubstantiated ideas perpetuated in academic literature. Instead we studied student perceptions, which is a convenience sample with interest in academic topics but with less exposure to the biases of academic literature. The student population is relevant, since they will be primary consumers of ideas coming from the paradigms held by instructors. At a minimum, surveying students will reveal which paradigms they are most likely to buy into given their frame of reference at the time of the study.
An online survey was administered to students at the author’s home institution in April of 2006. Examples of survey items are listed in Table 1, with all items being measured on a seven-point “strongly disagree” to “strongly agree” Likert scale. (Of course, survey items were intermixed so that items for a given scale were not adjacent, and forms were used to control for response ordering bias.) The full survey had 56 items that represented 23 multi-item constructs. The survey was subjected to three rounds of pretests that involved approximately thirty subjects. The survey was publicized through posters on campus, as well as by an emailing to business school students. (We did not ask study subjects about their major field of study, but suspect more of them were business students than from humanities or other majors.)

The survey resulted in 1408 responses. Statistical analysis was run to detect frivolous or inconsistent responses (such as providing the same answer for every question just to be entered in the prize drawing), leaving 1372 responses. An additional 40 responses were identified as coming from subjects who had taken the author’s Services Management course, which were also eliminated due to the potential for instructor-induced bias. We were left with 1332 usable responses. Each survey instance asked the subject to respond relative to one of 70 business processes, a sample of which is shown in Table 2. The fundamental scale of the survey is the SERVICE scale, composed of the following three items (shown here relative to the process of farming by farmers for customers who are specified as food consumers):

- **Farming** is a service business.
- **Farming** is in a service industry.
- **Farming** primarily involves providing services to customers (food consumers).
The underlined words changed depending on which of the 70 industries the subject was responding about (underlines not shown in the actual survey). Admittedly, the SERVICE scale items refer to the classification of businesses and industries, which is technically imprecise but conceptually common. However, all items were expressed as processes (as gerund verbs) to assure evaluative precision. The SERVICE scale has a Cronbach’s α of 0.8864, indicating strong reliability. The meaning of the SERVICE scale is “[The given process] is considered to be a service.”

>> Insert Table 2 about here <<

Table 2 shows how the business processes vary according to the SERVICE scale. The processes listed at the top are clearly services in subjects’ minds, and those at the bottom are clearly non-services, with some in-between examples given. The resulting discrimination according to the SERVICE construct appears to have good face validity, particularly at the extremes. Convergent validity of the scale was demonstrated by high inter-item correlations.

**SP Comparison Results/Findings**

The survey scales listed in Table 1 assess subjects’ perceptions of the service paradigms (SPs) reviewed in the prior sections, including separate scales for specific elements of IHIP. Those scales also had high Cronbach’s α values (with a few scale items being dropped, mean α was 0.7718, minimum α was 0.6470). Since the paradigms are supposed to discriminate services, a key question is how each paradigm scale correlates with the SERVICE scale. High correlation indicates better potential for defining services than low correlation. Table 3 shows the Pearson correlation coefficients for each scale relative to the SERVICE scale.

>> Insert Table 3 about here <<
Each correlation coefficient was non-zero at a <0.01 level, which means that they all can be considered to pertain to the concept of “services.” Nevertheless, there is a wide range of coefficients. The strongest correlation is for SP₈, the customer-supplier paradigm. This suggests that SP₈ has the best ability to predict that subjects would perceive a given process as being a “service.” The items in the SP₈ scale had good construct validity: the SP₈ items correlated much stronger with each other (convergent validity) than they did with the items from other constructs (discriminant validity). This affirms that SP₈ is a distinct paradigm, and not just a repeat of one of the other paradigms. (The other SP scales also had good construct validity.)

It may seem odd that the “residual” (SP₁) definition by exclusion is the next most closely correlated service paradigm, since SP₁ may be considered a “non-paradigm.” However, the SP₁ significance is actually logical and valuable, since it indicates that there is in fact a perceived difference between manufacturing/agriculture/extraction and something else we call “services.” This counters the unfounded logic that “everything is a service.”

There are statistically significant differences between various correlation coefficients in Table 3. For example, the differences between the correlation coefficient of SP₈ and those of SP₁, SP₃, and SP₇ are not statistically significant, but correlations for the other paradigms are (at a <0.01 level). This indicates a statically cost for other than the top four candidate paradigms. Note that with one exception, the weakest five items are the IHIP service characteristics. One explanation for those weaker correlations is that the IHIP characteristics are not defining paradigms but rather “symptoms of services,” which is to say that they often are manifest in services but do not cause processes to be services (Sampson 2001, p. 49, 89). We have elsewhere argued that each of the IHIP
characteristics can be directly explained by the presence of customer inputs (Sampson and Froehle 2006).

**Similar Actions in Different Contexts**

The logic that services can be defined as such by a reliance on customer inputs (SP3) is further emphasized through specific process examples included in the study. For example, the process of “painting cars by auto companies for consumers” (N=36) produced a mean SERVICE value of 0.843, whereas “painting cars by paint shop employees for car owners” (N=37) produced a mean SERVICE value of 1.964, the latter being rated as being more service-like (the difference being significant at <0.01 level). Either way it is “painting cars,” but the difference is painting cars coming from the upstream supply chain versus painting cars supplied as inputs by customers, which manifests a “service” difference in the subjects’ minds.

Another example is musicians recording music such as in a studio (N=36, mean SERVICE=0.898) compared with musicians giving live musical performances (N=35, mean SERVICE=1.771), the SERVICE scale difference also being significant at <0.01 level. In either case, the musicians are playing musical instruments—with the latter, customers provide themselves as inputs to the performance process, but with the former they do not. You will likely find that musicians themselves describe the action of performing in front of customers as being quite different from performing in a studio, and that managing live performances is quite different from managing a studio recording session. We attribute the managerial differences to the involvement of customer inputs (their selves and attention) in the live performance process. Distinct managerial differences were confirmed by additional empirical data.
Managerial Issues

The survey had additional scales pertaining to specific managerial issues. We identified five characteristics which were highly correlated with the SERVICE scale (at <0.01 significance level): time-perishable capacity, customer-driven location, time-based measurement, low entry barriers, and customer as competitor. Details are omitted here for space reasons. We tested a LISREL structural equation model that represented the five scales (and one other) as a simultaneous function of both SP₈ and SERVICE. The model had a good fit, with a Root Mean Square Error of Approximation (RMSEA) of 0.054. Interestingly, the five scales had stronger path coefficients coming from SP₈ than from SERVICE, implying that these “service” characteristics are especially characteristics of “processes that rely on customer inputs.” This was confirmed by correlating the six consequence scales with the difference between SP₈ and SERVICE (for each subject), which captures correlation represented in SP₈ which is not accounted for in SERVICE. Four of the correlations were both positive and highly significant (<0.01 level), suggesting that in some ways there might be more managerial value in studying “processes that rely on customer inputs” than simply studying “processes considered services.”

Limitations

One limitation of this test of managerial issues is the limited set of service characteristics studied. Another limitation of this empirical study is the use of the student convenience sample, since other populations may report different results. We reduced one type of bias by removing responses from students attending the Services Management course. There may be other biases experienced by students, although those biases may also be present in other possible populations. Future research could look at
and compare service paradigm perceptions for practitioners, researchers, and other populations.

CONCLUSION

This article has reviewed various service paradigms, largely originating from services marketing, and has presented an operational paradigm based on customers being suppliers of process inputs. The customer-supply services paradigm was shown to be logical, to exhibit strong face validity, and to be empirical supported. Further, the customer-supplier services paradigm overcomes the biases inherent in service marketing paradigms. Nevertheless, it is also consistent with ideas coming from the marketing literature. For example, Lovelock and Gummesson state, “without customers who require service at a specific time, either to themselves or their possessions, there can be no output at most service organizations” (2004, p. 30).

The value of the customer-supplier services paradigm is seen in the significant managerial implications. For example, we observe that comparing “goods” with “services” is a confusing correlation. It is clearer and more useful to compare service processes (which involve customer inputs) with non-service processes (which do not involve customer inputs). Our empirical data also demonstrates that processes which can be performed with or without customer inputs (e.g., painting and music performance) are considered more service-like when they have customer inputs than when they do not. In other words, the reliance upon customer inputs is shown to make a “service” difference. Discussion of the implications of the paradigm are limited by space; those wanting more detail are referred to other publications by Sampson (2000; 2001) and Sampson and Froehle (2006), which again refer to the paradigm as the “Unified Services Theory.”
References


Table 1: Survey items pertaining to Service Paradigms (SPs) (process=farming)

SP1: Farming is manufacturing, or agriculture production, or natural resource extraction.
SP1: Farming produces something that can subsequently be sold and used by customers (food consumers).
SP1: Farming is manufacturing work, or farm work, or gathering natural resources.
SP2: Customers (food consumers) ultimately own output that comes from farming.*
SP2: Customers (food consumers) can take the output of farming and sell it to someone else.*
SP2: Farming involves transferring ownership of products to customers (food consumers).*
SP3: Farming is an action performed for customers (food consumers).*
SP3: The output of farming is an action performed for customers (food consumers).*
SP3: Farming involves performing actions for customers (food consumers).*
SP3: Farming involves performing actions for customers (food consumers).*
SP4: The outputs of farming are physical items.
SP4: Farming involves tangible work.
SP4: The output of farming can be touched.
SP4: The output of farming is tangible.*
SP5: The process of farming is the same from one instance to the next.*
SP5 (heterogeneity): The output of farming is the same from one instance to the next.*
SP5 (heterogeneity): The process of farming varies dramatically from one instance to the next.*
SP5 (heterogeneity): Farming provides pretty much the same thing for every customer.*
SP5 (inseparability): Customers (food consumers) begin consuming the output of farming about the same time as the work of farming is performed.*
SP5 (inseparability): The work of farming is performed at about the same time as customers (food consumers) receive the output of farming.
SP5 (perishability): The output of farming does not last very long.*
SP5 (perishability): The output of farming is quite perishable.
SP6: Farming involves renting things to customers (food consumers). (x)
SP6: Farming involves allowing customers (food consumers) to access the location, people, equipment, or technology of farmers.
SP6: For farmers who are farming, customers (food consumers) primarily pay to have access to the location, or people, or equipment, or technology of the farmers.
SP7: Farming involves a lot of interaction with customers (food consumers).
SP7: Interacting with customers (food consumers) is a key element of farming.
SP7: A lot of the work time in farming is spent interacting with customers (food consumers).
SP8: Farming involves working on something provided by customers (food consumers).
SP8: Farming is dependent upon customers (food consumers) first providing something for the farmers to work on.
SP8: Farmers cannot do the work of farming unless customers (food consumers) first provide themselves, or something that belongs to them, or their information.
* = reverse scale item. (x) = removed to increase scale Alpha.
Table 2: Examples of processes by mean SERVICE scale values

“Services” (highest SERVICE scale means)
- counseling by psychologists for patients (N=34)
- auditing financial records by accountants for client firms (N=35)
- planning travel by travel agents for travelers (N=33)
- dry cleaning laundry by dry cleaners for consumers (N=36)
- management consulting by consultants for client firms (N=35)
- performing surgery by surgeons for patients (N=33)

In-between services and non-services (medium SERVICE means)
- broadcasting sports events by television stations for viewers (N=35)
- leasing new cars by auto dealerships for consumers (N=34)
- broadcasting sports events by television stations for sports team owners (N=38)
- printing newspapers by news publishers for readers (N=36)
- producing electricity by power companies for consumers (N=35)

“Non-services” (lowest SERVICE means)
- farming by farmers for food consumers (N=37)
- printing books by book publishers for book readers (N=34)
- mass producing wood furniture by furniture companies for retail consumers (N=36)
- producing automobiles by auto companies for consumers (N=33)
- refining fuels by oil companies for consumers (N=36)
- mining diamonds by mining companies for jewelry producers (N=35)

Table 3: Correlation of SP scales with the SERVICE scale

<table>
<thead>
<tr>
<th>Corr*</th>
<th>Service paradigm scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.504</td>
<td>SP₈ (customer-supplier)</td>
</tr>
<tr>
<td>0.502</td>
<td>SP₁ (residual)</td>
</tr>
<tr>
<td>0.470</td>
<td>SP₃ (act/performance)</td>
</tr>
<tr>
<td>0.469</td>
<td>SP₇ (customer contact)</td>
</tr>
<tr>
<td>0.418</td>
<td>SP₆ (rental/access)</td>
</tr>
<tr>
<td>0.352</td>
<td>SP₅ (inseparability)</td>
</tr>
<tr>
<td>0.325</td>
<td>SP₃ (non-ownership)</td>
</tr>
<tr>
<td>0.292</td>
<td>SP₄ / SP₅ (intangibility)</td>
</tr>
<tr>
<td>0.189</td>
<td>SP₅ (heterogeneous production)</td>
</tr>
<tr>
<td>0.171</td>
<td>SP₅ (perishable output)</td>
</tr>
<tr>
<td>0.159</td>
<td>SP₅ (heterogeneous output)</td>
</tr>
</tbody>
</table>

*all Pearson’s correlation coefficients significant at <0.01 level