WHICH SERVICE CHARACTERISTICS DETERMINE THE DEGREE OF CUSTOMER CO-PRODUCTION IN SERVICE GENERATION?

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ABSTRACT

Drawing from Chase’s customer contact model and customer co-production in operations and marketing literatures, a three-dimensional framework is presented for service process design. These composite dimensions are derived by combining the appropriate attributes from a list of nine common characteristics of business services. Research implications are then discussed.

KEYWORDS: Service attributes, customer co-production, three-dimensional typology

INTRODUCTION

Recent estimates indicate that the services employ close to 83% of the entire U.S. workforce (Lee & Mather, 2008). Services were long considered impenetrable by international competition. However, due to the improvements in the Internet, services can now cross geographic boundaries through dedicated connections and networks (Andone & Pavaloaia, 2010). As more and more services are offered by firms and used by consumers, service firms are finding it increasingly difficult to meet all customer needs with only employee efforts. Furthermore, as many service firms have already discovered, getting customers to participate in generating the service to some degree is likely to better satisfy customers because customers begin to believe that they themselves are partly responsible for the quality of the service that they ultimately receive. Thus, customer participation has become an important part of most service delivery processes (Chase, 1978; Karmarkar & Pitbladdo, 1995; Lovelock & Young, 1979).

In many service generation processes, the customers’ efforts and the employees of the firm are substitutable to some degree (Xue, Hitt, & Harker, 2007). Although self-service has long been an alternative to full-service by employees in many industries (e.g., gas stations), the development of new technologies and innovation in product design have led to an increase in the scale and scope of self-service utilization. Millions of consumers now use the Internet for managing bank accounts, trading stocks, booking flights, buying movie tickets, tracking packages, and selling everything from house wares to used cars using websites like Craigslist. The impact of the proliferation of self-service is evident in all major service industries.

The role of the customer as a co-producer of services has been long suggested in operations management and marketing literatures. Early research on service operations management noted the interaction between the customer and firm (Chase, 1978) and the importance of integrating the production role of customers into the design of service delivery systems (Globerson &
Maggard, 1991). Prior research has also noted that the design of these self-service delivery systems can have significant competitive implications (Heskett, Sasser, & Schlesinger, 1997; Karmarkar & Pitbladdo, 1995). Service delivery systems could have a major effect on firms’ operations strategy such as in deciding their capacity (Ellram, Tate, & Billington, 2004; Roth & Menor, 2003), as well as on the operational performance of other business processes that directly interact with the customers such as sales and marketing (Xue et al., 2007).

The reasons for adding customer self-service to the overall service delivery mix are simple – by piling tasks onto customers and enabling them to pursue their own service needs, firms can often provide customized services at mass-production cost levels (Xue et al., 2007). Many technologies underlying self-service, such as Internet-based ordering or customer support, also enjoy significant economies of scale while providing greater access, flexibility and convenience. Customers’ participation in service co-production processes has been increasing with the rapid development of self-service technologies and business models that use self-service as the main service delivery channel. No comprehensive framework, however, is available in extant literature that could be used by firms to evaluate their service offerings before deciding the degree of customer co-production. Thus we explored the following research question in the context of service firms: Which service characteristics determine the degree of customer co-production in the service generation process?

To fill the aforementioned gap in current literature, we propose a comprehensive three-dimensional typology having composite dimensions. These composite dimensions are derived by combining the appropriate attributes from a list of nine common characteristics of business services – the value of service, nature of service delivery, degree of tangibility, production of the service, direction of the service, skills required for the service, degree of repetitiveness, degree of standardization, and the nature of demand. Using this three-dimensional typology we then explore whether customer co-production of services in each of the eight service categories (referring to the eight quadrants of the typology) is likely to be beneficial for the firm. This paper contributes to service operations literature in two ways. First, it presents a comprehensive typology based on combination of service attributes, thereby covering all varieties of services. Second, with the application of a mid-range theory from operations to each of these eight categories, this paper clearly identifies the appropriate degrees of customer co-production for a variety of services, thereby giving suggestions for improved service process design.

THEORETICAL FRAMEWORK AND PROPOSITIONS

Service Attributes

Because services are diverse, generalizations concerning the management of service organizations are difficult to establish. Thus a considerable amount of research has been focused on developing service classifications (Chase & Hayes, 1991; Karmarkar & Pitbladdo, 1995; Kellogg & Nie, 1995; Lovelock, 1992; Roth & van der Velde, 1991). Research on several typologies of services has provided directions for improving quality, productivity and operating efficiency (e.g., Fagerberg, Mowery, & Nelson, 2006; Haywood-Farmer, 1988; Schmenner, 1986). Most classifications, however, fail to include all types of services, since they did not derive their dimensions based on all service attributes; and services differ in one or more of their
attributes. For example, the most commonly cited, the service process matrix (Schmenner, 1986), is a classification of service industry firms based on the three characteristics of the firm’s service processes that include the degree of labor intensity, the degree of customer interaction and customization. It is thus necessary to incorporate all service attributes in a comprehensive services typology. Based on the extant services literature (Feinberg & Kadam, 2002; Fitzsimmons & Fitzsimmons, 2010; Leenders, Johnson, Flynn, & Fearon, 2005; Roth & Menor, 2003; Sousa, Yeung, & Cheng, 2008), we use the nine common service attributes that differentiate them from products. Next, we combine the appropriate service attributes into three composite dimensions, which we later use in our proposed three-dimensional services typology.

If highly specialized skills are required for generating the service, then that service could be difficult to generate because specialized skilled people may be difficult to find. If the service generation does not require any specialized skills it could be easier for the firm to generate. If the service is highly repetitive, it could be easily produced since individuals learn with time and experience as compared to a rare service generated by the firm. If it is a highly customized and/or a completely different service than what the service firm is used to generating, it could be difficult for the firm to produce. If the service is highly standardized, it could become easier for the firm to generate, as compared to a highly customized and difficult service. If it is a discrete service, the firm would need to spend its energies in tracking quality only on that occasion, while if it is a continuous service, the firm would need to spend a significant amount of resources in tracking quality continuously and thus it would be more expensive as well as require more resources. Therefore on a continuous scale of ease of generation we consider it difficult. Periodic services could be combined with the discrete services on their difficulty level as compared to the continuous services, which would be the most difficult. Based on the above discussion supported by services literature (Feinberg & Kadam, 2002; Fitzsimmons & Fitzsimmons, 2010; Leenders et al., 2005; Roth & Menor, 2003; Sousa, Yeung, & Cheng, 2008) we suggest that four common service attributes – skills required for the service, degree of repetitiveness, degree of standardization, and nature of demand could be combined to represent a composite ease of service generation dimension.

If the service has a high degree of tangibility implying that a physical product is also used along with the service, the quality assurance becomes easier for the firm and quality verification becomes easier for the customer as compared to when it is a pure service. An example of a pure service is a problem resolution through a telephonic customer call, where the service quality cannot be essentially evaluated until the service has been performed. If there is no human contact and only equipment is used in generation of the service like in an ATM transaction, the quality assurance becomes easier compared to a service where people are involved to a greater extent in the generation of the service than the equipment as in the case of a bank teller transaction where the person at the counter advises the customer based on the customer’s expressed needs. On a similar note, if the service is directed at people, it becomes difficult for the firm to measure and assure the quality of the service, before it is performed. As an example, even in a reputed restaurant even though the quality of the food may be excellent, it may not be satisfactory in its taste and its price to a few customers, while it may be perfect to a few other customers. For building and maintenance services, the quality requirements are likely to be known before hand; hence quality of the service can be assured in most cases. Based on the above discussion supported by services literature (Feinberg & Kadam, 2002; Fitzsimmons & Fitzsimmons, 2010;
Leenders et al., 2005; Roth & Menor, 2003; Sousa, Yeung, & Cheng, 2008), we suggest that three common service attributes – degree of tangibility, production of the service, and direction of the service could be combined to arrive at a composite *ease of assuring service quality* dimension.

The dollars spent by the customer on purchasing the service could indicate the importance that the customer is ready to give the service. As an example, most people would choose their doctors based on a combination of their need (the problem that they are suffering from) and reputation of the doctor and would not mind spending a significant amount over the year on health checkups, getting new medications and refilling existing ones, while they are not likely to pay that much attention and that many dollars annually in selecting their car wash service. Customers are likely to insist on getting those services that are really complex, and on which they place high value, performed in-house at their own premises. Onsite IT systems testing, bug-fixing and support which a corporate customer insists on getting them done by the vendor at onsite are examples, while on the other extreme, anti-virus system roll out on all machines that are typically done from a remote location over the network are examples of standardized and impersonal services. Based on the above discussion supported by services literature (Feinberg & Kadam, 2002; Fitzsimmons & Fitzsimmons, 2010; Leenders et al., 2005; Roth & Menor, 2003; Sousa, Yeung, & Cheng, 2008) we suggest that the remaining two common service attributes – value of service and nature of service delivery could be combined to arrive at a composite *importance of service* dimension.

Using the above three composite dimensions – ease of service generation, the ease of assuring service quality, and the importance of service, we propose a comprehensive typology that could be used for evaluating all services. All services could be categorized as either high or low on each of the nine individual attributes. Therefore all services could also be categorized on the three composite dimensions, and mapped into any of the eight quadrants in a three-dimensional cube. We suggest that the above typology is comprehensive because it includes all the common nine service attributes that have been discussed in literature.

**Customer Contact Model**

A theoretical viewpoint empirically established in operations literature (Kellogg & Chase, 1995; Soteriou & Chase, 1998) notes the negative effects of the degree of customer contact/involvement in the service generation on the ability of the service firm to ensure the quality of its services. The degree of customer contact is defined as the ratio of time during which a customer is in direct contact with the service facility to the total time required for the creation of the service (Chase, 1981). Silvestro, Fitzgerald, Johnston and Ross (1992) identified the people-focused, people/equipment-focused and equipment-focused firms. Chase (1978, 1981) proposed that if there is less direct customer contact in the service system, the service system is more likely to operate at its peak efficiency. Conversely, the system is less likely to operate at its peak potential with a high direct customer contact.
Customer Co-production

Customer co-production of services has become mainstream topic of discussion in academic literature, especially in marketing (see Benpaudi & Leone, 2003; Prahalad et al., 2000; Prahalad & Ramaswamy, 2004; Lusch & Vargo, 2006a; 2006b; Solveig, 1996; and Vargo & Lusch, 2004). There are several unresolved issues related to customer co-production. First, there is a need to understand the linkages between the values created in consumption activities when co-creation of values takes place (Lusch & Vargo, 2006b) and the production operations that are involved (Lusch & Vargo, 2006a); these are inter-linked. Second, many studies of co-production focus on the implications of co-production for the supplying firms, discussing its contribution to firms’ productivity gains (Mills, Chase, & Margulies, 1983), or to their business strategies (Lambert & Garcia-Dastugue, 2006; Lehman, 2006). Scholars studying customer participation in service generation have defined consumers as “partial employees” of the service providers and have discussed ways of managing such consumers (Bitner, Faranda, Hubbert, & Zeithaml, 1997; Kelley, Donnelly, & Skinner, 1990). However, co-production is an explicit result of decision making by the consumers themselves that also reflect their own preferences. While some consumers may decide to adopt modes of co-production, such as using self service in gasoline stations, others may not and select such gas stations where they provide help to fill up the tank. A deeper understanding of how consumers decide whether or not to engage in coproduction, and the corresponding decision processes is imperative. Third, it is common knowledge that co-production is prevalent in some service categories and in some consumption situations but not in others.

Marketing literature considers the production process as a chain of sequential bundles of operational activities linked in a network chain (Achrol & Kotler, 1999) with each set of activities leading to the next (Porter, 1985), which is defined as the activity network chain. The various activities involve initiating and designing, resource aggregating and processing activities and ensuring delivery and executing use of service or the final consumption. Co-production implies that consumers participate in the performance of the various activities performed in one or more of these stages.

Co-production encompasses all cooperation formats between consumers and production partners. Thus, consumers may cooperate with public and government bodies in providing education, maintaining clean environments and providing local security (Whitaker, 1980). They may also cooperate with other consumers, accessing their resources (as is the case when downloading music from their computers); or co-working to create joint intellectual outputs, such as a collaborative event calendar (Upcoming), in which individuals enter events they attend and comment about them; or the open encyclopedia (Wikipedia) which is written and edited by the users themselves.

Propositions

Drawing from both viewpoints in marketing and operations, we propose that those services that are easy to generate; whose service quality can easily be assured; but are low in customer importance/value could require a higher degree of customer co-production to have the customer involved in the service generation (Benpaudi & Leone, 2003; Chase, 1981; Lusch & Vargo,

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2006a; 2006b; Prahalad & Ramaswamy, 2004; Prahalad et al., 2000; Silvestro, Fitzgerald, Johnston and Ross, 1992; Solveig, 1996; and Vargo & Lusch, 2004). It would give the firms two indirect benefits. First, the customer is likely to feel good in getting involved in deciding how exactly the service is performed since it would give the customer a sense of control over what he/she is getting. Second, the customers’ effort would substitute some of its own employee efforts, thereby saving the company time and money. Examples of services fitting this category are car wash services – (for individual consumption), and anti-virus software upgrade (for organizational consumption). Thus our first proposition notes:

**P1**: Firms providing services that have high scores on ease of service generation and ease of assuring service quality dimensions but a low score on importance dimension may require a very high degree of customer co-production in service generation.

We suggest that those services which score high on ease of generation dimension may generally require a higher degree of customer co-production than those services which score low on this dimension (Benpaudi & Leone, 2003; Chase, 1981; Lusch & Vargo, 2006a; 2006b; Prahalad et al., 2000; Prahalad & Ramaswamy, 2004; Silvestro et al., 1996; and Vargo & Lusch, 2004). Each type of service may need to be considered separately based on their score on the three dimensions. Examples of services fitting this category are the limited financial services offered within retailers like in Wal-Mart (for individual consumption), and IT systems requirements analysis with client team members (for organizational consumption). Accordingly, our next proposition mentions:

**P2**: Firms providing services that have high scores on all three dimensions – ease of service generation, ease of assuring service quality, importance of service – may require a moderately high degree of customer co-production in service generation.

We suggest that those services that have a high score on ease of generation dimension but low scores on other two dimensions could require a high degree of customer co-production (Benpaudi & Leone, 2003; Chase, 1981; Lusch & Vargo, 2006a; 2006b; Prahalad et al., 2000; Prahalad & Ramaswamy, 2004; Silvestro et al., 1992; Solveig, 1996; and Vargo & Lusch, 2004). Examples of services fitting this category are postal or courier services (for individual consumption), and club facilities provided by organizations (for organizational consumption). Similarly, for those services that have a high score on ease of generation dimension, a low score on ease of assuring quality dimension but a high score on importance dimension, we propose that they could require a high degree of customer co-production. Examples of services fitting this category are retail medicine shops (like Walgreens) filling/refilling prescriptions (for individual consumption), and counseling services for employees (for organizational consumption). Hence our third proposition notes in two parts:

**P3a**: Firms providing services that have high scores on ease of service generation dimension but low scores on ease of assuring service quality and importance dimensions may require high degree of customer co-production in service generation.

**P3b**: Firms providing services that have high scores on ease of service generation dimension but low scores on ease of assuring service quality but high scores on
importance dimensions may require high degree of customer co-production in service generation.

We suggest that those services which have a low score on ease of generation dimension, a high score on ease of assuring quality dimension but a low score on importance dimension could require a low degree of customer co-production (Benpaudi & Leone, 2003; Chase, 1981; Lusch & Vargo, 2006a; 2006b; Prahalad et al., 2000; Prahalad & Ramaswamy, 2004; Silvestro et al., 1992; Solveig, 1996; and Vargo & Lusch, 2004). Examples of services fitting this category are haircut (for individual consumption), and monitoring/installing software on individual computers (for organizational consumption). Similarly, those services that have a low score on ease of generation dimension, but high scores on ease of assuring quality and on importance dimensions could require a low degree of customer co-production. Examples of services fitting this category are bank teller transactions (for individual consumption), and electronic security monitoring services provided (for organizational consumption). Hence our fourth proposition mentions in two parts:

**P4a:** Firms providing services that have a high score on ease of service generation dimension, a high score on ease of assuring service quality dimension but a low score on importance dimension may require low degree of customer co-production in service generation.

**P4b:** Firms providing services that have a low score on ease of service generation dimension, but high scores on ease of assuring service quality dimension and importance dimension may require low degree of customer co-production in service generation.

We suggest that those services which have a low score on all three dimensions could require a moderately low degree of customer co-production (Benpaudi & Leone, 2003; Chase, 1981; Lusch & Vargo, 2006a; 2006b; Prahalad et al., 2000; Prahalad & Ramaswamy, 2004; Silvestro et al., 1992; Solveig, 1996; and Vargo & Lusch, 2004). Examples of services fitting this category are income tax consultation to finalize tax returns, like those provided by HR Block (for individual consumption), and common utility services like air-conditioning provided at offices (for organizational consumption). Hence our fifth proposition suggests:

**P5:** Firms providing services that have a low score on all three dimensions may require a moderately low degree of customer co-production in service generation.

Finally, we suggest that those services which score low on ease of service generation, low on ease of assuring service quality dimension but high on importance of service dimension could require a very low degree of customer co-production (Benpaudi & Leone, 2003; Chase, 1981; Lusch & Vargo, 2006a; 2006b; Prahalad et al., 2000; Prahalad & Ramaswamy, 2004; Silvestro et al., 1992; Solveig, 1996; and Vargo & Lusch, 2004). These services are those complex and difficult services that the customer values highly; they would not settle for just any service, but would be ready to pay much to receive exactly what they want. Because the quality of such services cannot be assured easily, the firm may need to give the utmost attention to this service attribute and involve their best in-house experts, so that the service quality standards are maintained. These services need the highest degree of skills in their generation; therefore the
firm should involve their most technical and service knowledge experts. Examples of such services are health check-up with doctor (for individual consumption), and IT networks maintenance (for organizational consumption). Thus our final proposition notes:

**P6:** Firms providing services that have low scores on ease of service generation and ease of assuring service quality dimensions but a high score on importance dimension may require very low degree of customer co-production in service generation.

While ranking all services, ease of generating the service is given the greatest weight; followed by the ease of assuring service quality, and the importance of the service (in reverse order, i.e., lower the importance of the service, the higher is the degree of customer co-production suggested), thereby ranking all services in the decreasing order of suggested customer co-production. The essential premise behind the ranking is to help the service firm substitute its employee effort with customers’ effort to at least some degree so as to save time and costs; such effort saved by the firm could be better used to ensure quality of the services offered or even to offer newer services (Xue et al., 2007).

**DISCUSSION AND CONCLUSION**

In this paper, we first examined the nine common service attributes – the value of service, nature of service delivery, degree of tangibility, production of the service, direction of the service, skills required for the service, degree of repetitiveness, degree of standardization, and the nature of demand – in detail and proposed three composite dimensions combining the appropriate attributes. Using these three composite dimensions – ease of service generation, ease of assuring service quality, and importance of the service, we proposed a three-dimensional services typology to comprehensively categorize all services into any of the eight categories. We further suggested which services may use a very high degree of customer co-production and which ones may use a very low degree of customer co-production, while ranking all services in a decreasing order of our suggested customer co-production.

Service firms may use the proposed comprehensive framework to evaluate each service that they offer. Firms offering services that are relatively easy to generate; and whose quality can easily be assured; but are not considered very important by customers (in terms of their dollar value) could require a very high degree of customer involvement and customer co-production in order to substitute its own employee efforts with those of the customers’, thereby saving a lot of time and money. Further, the employee effort so saved may be effectively put to ensure the service quality by paying careful attention to the details of the service. On the other extreme, for firms generating services that are quite difficult to generate; whose quality cannot be easily assured; and which are considered very highly by the customers (in terms of their dollar value) may not require much of customer co-production in their generation. For providing such services the firm needs to have its best qualified and trained employees perform the service so as to satisfy the customer. The proposed comprehensive framework may help service firms in understanding their customer needs better and in balancing them with its own needs of cutting costs of service generation without adversely affecting the quality of the service, thereby leading to a win-win situation for both customers and the service providers.
The framework has several practical implications for service firms. First, in those services where customer co-production has a very important role, managers could focus on appropriately socializing customers to perform certain expected co-production behaviors (Groth, 2005). Service firms frequently offer very little help on socialization other than showing a few signboards (Goodwin, 1988), and customers often rely on observing other customers in order to acquire knowledge about the service delivery process. The negative fallout could be that customers could easily imitate undesired behaviors that they observed from others or shy away from doing business altogether. Given the greater need of co-production behaviors in many Internet service deliveries, socializing customers could be important. Customers would often need to perform a variety of tasks that traditionally have been performed by service firm’s employees. While increased customer co-production often results in reduced costs and staffing needs for service firms, unsuccessful co-production due to a lack of proper socialization, could have negative effects. Customer socialization has a critical role in some Internet purchases where customers often have no one to turn to for help. Since some people may be unfamiliar with computers and the Internet as a medium to purchase products or services, service firms could put in extra effort to make the socialization process as flawless as possible. A few common options could include putting up the following on the company website: additional Readme files that describe the buying processes, posting videos that would walk the customer through the process, or having a link for customer to chat online so that he/she can ask questions that could be answered real time by company representatives.

In addition, service firms may benefit from actively managing customers’ perceptions of behavior that are required of the customer and those that are voluntary. If service firms conceptualize customers as human resources, they would be grossly mistaken to simply assume that the behavior their own managers consider as co-production behaviors would also be perceived as such by customers. Service firm managers could benefit from assessing their customers’ perceptions regarding their own role in the service delivery process. It would allow the service firms to actively manage the customer perceptions. In e-commerce businesses, service firms could clearly communicate to its customers on the website that giving input in the web site development process is an expected part of the service in order to perfect the service delivery. The ability to change customer expectations so that those behaviors which were initially perceived by customers as voluntary are subsequently perceived by them as expected could provide service firms with opportunities to effectively design their service processes.
REFERENCES


