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Defining Services for Designers

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Publication Date
2007-03-02

Defining Services for Designers:
Services as Systems of Social and Technical Relations

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Abstract

This paper is part of a larger effort to improve methodologies for service design. It focuses on one small, but fundamental, component of this endeavor: defining services in a manner useful for designers. Doing so provides common vocabulary and conceptual groundwork for differentiating services from products and distinguishing between different types of services. This paper begins by aggregating and refining existing definitions of services. As will be shown, services differ from products in that they are not entities; rather, they are social, technical or socio-technical relationships that transform something of value for the service recipient. The paper then offers conceptual strategies for characterizing similarities and differences between various service relationships. It proposes a multidimensional approach for mapping the service landscape. Such an approach differs significantly from existing classification approaches and represents an exciting area for future research.

Introduction

The services sector now represents well over 70% of the U.S. Gross Domestic Product (GDP). The economies of other industrialized nations are similarly segmented, and over half of the GDP in most developing countries comes from the so-called services sector. Despite the magnitude of its economic contribution, relatively little is known about the design and engineering of services. This lack of methodological knowledge contrasts sharply with the abundance of knowledge that has been developed around the design and engineering of manufactured products. Many of the current approaches to service design are slight modifications of processes developed for new product development.

This paper is part of a larger effort to improve methodologies for service design. It focuses on a small, but fundamental, component of this endeavor: defining services in a manner useful for designers. Doing so will provide a common vocabulary and conceptual groundwork for differentiating services from products and distinguishing between different types of services. This paper begins by aggregating and refining existing definitions of services. As will be shown, services differ from products in that they are not entities; rather, they are social, technical or sociotechnical relationships that transform something of value for the service recipient. The paper then offers conceptual strategies for characterizing similarities and differences between various service relationships. Lastly, the paper places the previously developed conception of services into its larger inter-organizational context. The paper argues that all services are actually members of complex service systems. This web of service dependencies suggests that design methodologies need to consider not only the individual encounter of a service-provider and a service-recipient, but the network of service relationships needed to accomplish each service offering.

Defining Services

Developing a robust methodology for service design requires a clear understanding of what makes something a service. While managers, engineers and designers tend to have a fairly common understanding of what makes something a product, they often lack a shared idea of what makes something a service. Most attempts to formalize a general definition offer only partial guidance. They tend to suggest that services are: intangible, perishable, experiential, and co-produced between customers and providers (Dolfsma, 2004). While these traits can be associated with many services they do not, on their own, sufficiently distinguish services from goods. They also skew conceptions of services towards particular types of services: ones in which service recipients are the object of transformation. What follows is a review of these currently popular definitions and recommendations for how these conceptions can be reworked to form a more accurate and clear understanding of services.

One of the most frequent characteristics attributed to services is the quality of intangibility. A common example of this approach is put forth by *The Economist* magazine. They define services as "products of economic activity that you can't drop on your foot." Similarly, the U.S. Bureau of Economic Affairs (BEA) defines services as products that cannot be stored and that are consumed at the time of their purchase. These notions are echoed and expanded upon by several recent authors who write about services. After reviewing services literature Dolfsma (2004) identifies four traits that define services, one of which is intangibility.

A second characteristic identified by Dolfsma it that services are perishable. This idea relates to the BEA's notion that they cannot be stored and must be consumed when purchased. While goods can be produced and then stored, services require the interaction of a service-provider and a service-recipient and thus can't be stored or stockpiled in anticipation of demand. This concept relates to an additional characteristic identified by both Teboul (2006) and Dolfsma: services require participation, or co-production, on behalf of the service recipient. Furthermore, both Teboul and Dolfsma identify services as experiential. Teboul makes this point by differentiating between the object that gets transformed in a service, versus product, production process. In the case of "pure services" *customers* are transformed; in the case of "pure products" *raw materials* are transformed. The transformation of the customer is accomplished by an experience (Teboul, 2006, p. 9).

While these characteristics can accurately be attributed to most services, they can also be misleading and do not always differentiate services from other forms of economic activity. When taken by itself, as *The Economist's* definition does, "intangibility" insufficiently differentiates services from certain types of goods. Peter Hill (1999) recognizes the limitation of the "intangibility" criteria. Hill improves on *The Economist's* definition by distinguishing between "services" and "intangible goods." For Hill, information-based products such as music, films, architectural plans and even drug formulas are actually goods, not services, even though they pass *The Economist's* test for intangibility. Hill argues that such products are a special type of good because they are

entities: they can be owned and traded (thanks to intellectual property laws), they maintain their identity over time, and they exist regardless of who possesses them. In other words, they can be stored, replicated, and distributed: qualities not permitted by the U.S. BEA's or Dolfsma's definitions of a service but within the realm of that offered by *The Economist*.[1] Another problem with the intangibility requirement is that many services rely on, affect and produce tangible outcomes. A hair cut causes a tangible change in one's appearance. Getting an antique chair repaired causes a tangible transformation to the chair. In both cases, tangible resources are needed for the service provider to accomplish the desired transformation. Too much focus on intangibility risks excluding these types of services from our classification of services and threatens to misguide our attention away from the tangible components of service execution.

The addition of a perishable requirement – included in both Dolfsma's and the BEA's definitions – prevents intangible goods from being misclassified as services. While this characteristic helps exclude intangible goods, it allows certain types of physical goods to be misclassified as services. Certain goods, like raw fish, are extremely perishable but do not qualify as services. Additionally, many services are not fully "consumed" at the time of purchase: a person who gets their car's transmission replaced (a service) continues to benefit from this service far after the moment when the service is paid for.

Teboul's notion that pure services differ from pure products depending on the object that is being transformed, and Dolfsma's focus on co-production and the experiential quality of services position the service recipient centrally. While this insight proves to be helpful, the ways by which they articulate it are, again, misleading. Teboul's focus on the transformation of the customer, as opposed to raw materials, leaves little room for services that involve material transformation, such as the car transmission example cited above. Similarly, a focus on the "experiential" quality of services does little to distinguish services from goods. All economic activity is eventually experienced in one way or another. What the authors might be trying to suggest is that goods can exist without being experienced – say if they are sitting in a warehouse – whereas services only exist if they are experienced. Yet the distinction is false. The goods sitting in the warehouse have the *capacity* for being experienced, they just have not yet been put to use. Similarly, most services require tools and other resources that exist regardless if they are being used. Both have experiential potential that is actualized when the resource is put to use.

Again, a more helpful definition is offered by Peter Hill (1999). Hill shares Teboul's and Dolfsma's recognition that the service recipient plays an important role in services. But Hill goes further and frames services as transformational relationships, as he puts it: "A change in the condition of one economic unit produced by the activity of another unit" (p. 441). This definition might rely too heavily on economic terminology to be of much use for service designers but its underlying meaning deserves unpacking and examination. By "economic unit" Hill seems to mean an individual, division, organization or other agent

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[1] These special types of entities differ from physical entities in that they do not have physical characteristics or spatial dimensions; often they are easily replicated and distributed. Their value lies in the original intellectual abstraction not in the encoded manifestation of the work (e.g. the digital music file that is bought and consumed).

that participates in the economy. Like Teboul and Dolfsma, his definition requires at least two "economic units" for a service to occur: a service provider and a service recipient. Additionally, this definition implicitly suggests a transformation: the activity of one or more agents affects something of value for the other. This transformation could result in a material change – as in the case of a person getting their car transmission repaired – but it could also result in an intangible outcome – as in the case of an executive hiring an attorney to advise her company. In each of these scenarios, a service requires a relationship between two or more actors to achieve a meaningful transformation for the service recipient.[2]

Hill's work helps point the way towards a simple and clear way to distinguish between products and services. Unlike products and intangible goods, services are not entities. Instead, they are an *approach for achieving desirable outcomes*, an approach that relies on someone or something else to achieve the desired result. In this regard, a service is actually a functional relationship, a partnership in which an actor who wants a transformation comes together with other actor who can help them achieve it.

The drawback of such a simple definition is its generality. Nearly any social or transactional activity could be characterized in this way. Even the mass production of goods could be seen as a type of partnership between consumers and producers. And, indeed, mass production is a type of service: we pay producers to accomplish manufacturing. But we do not generally pay manufactures to accomplish the transformations afforded by the goods they produce. This last point may seem unnecessarily abstract, but it illustrates a final critical point needed to properly define services: With products, some of the means needed for achieving a desired outcome are sold to a customer who then uses them to achieve the desired outcome. Gillette sells razors and blades to individuals who then use them to *shave themselves*. Henry Ford sold automobiles to people who then used them to *transport themselves*. With services, some of the means needed to achieve a desired outcome are retained by the service provider. The service consumer achieves desired outcomes by relying on the service provider to help accomplish the desired transformation. A man goes to a barbershop and pays to be *shaved by the barber*. A woman hails a cab to be *transported by the cab driver*.

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[2] It should be noted that these relationships between "actors" are often facilitated by machines. The initiation and fulfillment of a service request might be conducted entirely by machines. But these machines are not, themselves, actors; rather, they are programmed to act on behalf of individuals or organizations.

Distinguishing Between Services

While the above stated definition provides a useful way to distinguish services from other types of economic activity, its usefulness for designers is hampered by its far-reaching conceptual borders. The definition allows the term services to be applied to each of the following with an equal degree of accuracy: recycling and refuse programs, ATM machines, travel by airlines, manicurists, eating at a restaurant, and tax preparation. These examples represent but the utmost tip of the services iceberg.

Designers and managers need common ways to recognize different patterns of services. Doing so can allow for the reuse of approaches, and perhaps even solutions, between projects. How then should such a wide range of economic activity be organized? The U.S. Census Bureau offers one solution that segments the services landscape into a hierarchically arranged classification system. According to this system, services can be classified according to 15 different top-level categories. Top level categories include groupings as varied as "Health Care and Social Assistance," "Accommodation and Food Services," and "Administrative and Support and Waste Management and Remediation Services."

While such an approach might serve the Census well, its rigidity and rationale are not suited for designers. Instead of classifying services into mutually exclusive, hierarchically related, categories, as the Census attempts to do, services can be differentiated by scoring them along a series of dimensional characteristics. Teboul (2006) and Bullinger, Fahnrich, and Meiren (2003) identify two such dimensions. The first is a continuum running between standardization and customization of the service outcome, to use Teboul's language. Bullinger et al. refer to this dimension as the degree of "variety" in the service offering. In general, highly customized services tend to be more expensive and resource intensive for the service provider. Teboul uses the example of hotel chains to illustrate this point. A luxury hotel like the Ritz Carleton offers many more specialized services than a Motel 6.

Another dimension put forth by both Teboul and Bullinger et al. is the intensity of the service interaction. Teboul define this dimension as the amount of people and processes required at the moment of service delivery. Bullinger et al. define it according to the amount of contact required in the service interaction, what they calls the "yardstick of interrelationships between employees and customers" (p. 6). For Teboul, services like visiting a doctor or consulting with a lawyer would be considered "high-touch" services whereas the use of an ATM machine or online booking system would be considered "low-touch" (p. 36).

While this dimension appears to be useful for differentiating between services, designers will quickly discover that service intensity itself can vary along many dimensions. An automated service like filing taxes online might require high levels of human touch on behalf of the service recipient but low levels of human touch on behalf of the service provider. Similarly, some services require high degrees of cognitive processing whereas others do not. The degree to which a service can be considered intense along these

additional dimensions affects the types of solutions a designer will want to pursue. As a result, it is helpful to break the dimension of service intensity into several, more specific, dimensions. These include, but are not limited to:

- Employee Time Intensity: How much employee time is required to provide the service.
- Consumer Time Intensity: How much time must the service consumer devote in order to accomplish their objective? *This is not the same as employee time intensity, since the consumer might be required to wait in queues or interact with an automated system that doesn't involve employee interaction.*
- Resource/Technology Requirements: For both the consumer and service provider, how much technology and other capital intensive resources must they control in order to perform the service?
- Automation of the Service Interface: How much interaction with automated systems does the service require of the service consumer?
- Cognitive Intensity: How much cognitive training and capacity do providers and consumers need to have in order to accomplish the service? *For example, a medical examination requires more cognitive intensity from an employee than providing a retail experience.*
- Physical Intensity: To what degree are physical objects transformed by the service?
- Information Intensity: How much of the service depends on the exchange and transformation of information?
- Emotional Intensity: To what degree are the experiences of the service consumer and service provider likely to involve emotional contours? *For example, a doctor who must deliver bad news to a patient offers a very different type of service than that offered by an online travel reservation site. Similarly, going on a new ride at Disneyland evokes a much different response from the service consumer than having one's trash collected every Tuesday morning at 7 A.M.*
- Risk Levels: How much risk is involved in performing the service, both for the service provider and the service consumer?

While this list is far from complete, it provides a beginning set of dimensional criteria that designers can use to differentiate services. By mapping services along these dimensions, service designers will be able to recognize similar design challenges between distinct service offerings. Dimensional similarity should also afford greater portability of already crafted design solutions, allowing designers to reuse findings between projects.

Service Systems

Thus far this paper has focused on a rather simple version of services: a single service provider and a single service recipient form a relationship that allows them to accomplish a transformation of value for the service recipient. While this simplification has been useful for understanding the basic elements of a service, the complexity of relations required to accomplish the transformation have been ignored. The means by which a desired transformation is accomplished are complex and often hidden from the service recipient. In order to accomplish even the most simple service, numerous interrelations also have to be coordinated. Each relation could be between two or more individuals or organizations, between two or more individuals or organizations and machines, or, even, between two or more machines or machine processes. Each of these interrelations can be treated as its own service relationship. We call this complex web of interrelated service relationships a service system. We borrow the term from Maglio, Srinivasan, Kreulen, and Spohrer (2006) who state: "Service systems are value creation networks composed of people, technology and organizations. Interventions taken to transform state and co-produce value constitute services" (p. 81). In other words, service systems are networks of relationships that afford transformations of value for those positioned as service recipients within the network.

By focusing on the means by which a service is accomplished designers will quickly realize that opportunities for service design exist not just between the organization and the end customer, but throughout and between organizations themselves. Within an organization, a simple end-customer service likely requires multiple employees and technical systems to perform services for one another. When a customer orders a meal from a fast-food restaurant's drive through window they may only interact with a single employee. Yet the employee relies on numerous other employees and technologies in order to fulfill the customer's request. From the front-line employee's point of view, the other employees and technologies must perform services for him so that he can satisfactorily perform the service for the customer. Furthermore, these dependencies extend across organizational boundaries. Several fast-food restaurants have recently outsourced the order-taking process to third-party firms. In so doing, non-collocated individuals who work for other firms end up being the initial point of employee-customer contact. The process of taking the order is accomplished by the third-party vendor who then passes the request back to employees within the restaurant. In doing so, the third-party employee is providing a service to both the restaurant and its employees, all to make possible the service for the end-customer.

Understanding services in this manner is important for service designers for several reasons. First, service designers should be aware of the interrelations needed to accomplish end-customer services. Each service relationship in a service system can be the object of design and, ideally, designers should look to improve the system as a whole, not just an atomized component. Additionally, the webwork of dependencies in a service system raise important questions for organizational strategy. As has been stated earlier, one of the factors that differentiates services from products is ownership and control over

the means of transformation. While services themselves cannot be owned and stored,[3] the resources and knowledge needed to perform a service can. Service system designers must decide which transformational capabilities should be owned and/or controlled by whom. These decisions affect the relationship between end-customers and the organization, between individuals and divisions within the organization, and between the organization and outside partners.

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[3] The increasing ubiquity of sensing and recording technologies is raising interesting issues in this regard. While experience itself can't be owned or stored, records of an experience can be. Many service providers capture and store information about the co-produced service experience. Debates over who owns and controls these records of experiences are likely to grow in the years ahead.

Conclusion

Despite dominating economic activity, services remain poorly defined for those who wish design them. Current definitions focus on identifying characteristics that can function as a sort of litmus-test for services: is the phenomenon in question intangible, perishable, co-produced and experiential? Such an approach is both insufficient and unnecessary. It does a better job of disqualifying most physical goods than it does constructing a positive definition for services. A better definition frames a service as a relationship where service providers helps service recipients accomplish a transformation to something the consumer values and controls. Such a general definition encompasses a diverse assortment of economic relations. To segment this diverse collection into more manageable groups, services can be evaluated according to the degree to which they require or embody a series of characteristics that have significant design implications. Services that resemble each other in this multidimensional space can likely share design methodologies and solutions. Finally, all services exist in larger networks of social, technical and sociotechnical relations, each of which is also a service according to the definition of services put forth in this paper. These relations exist between companies and their customers, between employees, systems and divisions within an organization, and between organizations. All individual relations, as well as their networked dependencies, are potential areas for design. What is now needed are methodologies for designing these types of relationships.

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