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Constructing Effective Value Propositions for Stakeholders in Service System Networks

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Abstract

The concept of value co-creation is a fundamental theme of Service-Dominant Logic, which has been an important theme of current research thinking in service science. This concept has become more complex since more and more service systems are configured as service networks with a concomitant increase in the number and interaction of stakeholders. Single provider service systems are becoming more rare as globalization and technological advances are changing revenue sources and business models. The purpose of this research is to develop a conceptual model for constructing effective value propositions for stakeholders in the design of service system networks. This Value Proposition Model (VPM) will take an approach that considers both the stakeholders (esp. the customer) and the providerâ s perspectives in value determination. The model will be useful in the development of the business model for a service system in ensuring that the value systems of the stakeholders are taken into consideration. The success of the service system will depend on how this stakeholder perspective is taken from the customer-facing aspect of the front stage to the technical implementation in the back stage. In the following we will develop the model using the customer as the prime stakeholder. The applicability of the model to value propositions for other stakeholders will also be demonstrated.

Keywords: Value Co-creation, Value Proposition, Service Systems, Service Networks, Stakeholders.

INTRODUCTION

The concept of value co-creation is a fundamental theme of Service-Dominant Logic, which has been an important theme of current research thinking in service science. This concept has become more complex since more and more service systems are configured as service networks with concomitant increases in the number and interaction of stakeholders. Single provider service systems are becoming more rare as globalization and technological advances are changing revenue sources and business models.

The purpose of this research is to develop a conceptual model for constructing effective value propositions for stakeholders in the design of service system networks. This Value Proposition Model (VPM) will take an approach that considers both the stakeholders (esp. the customer) and the provider's perspectives in value determination. The model will be useful in the development of the business model for a service system in ensuring that the value systems of the stakeholders are taken into consideration. The success of the service system will depend on how this stakeholder perspective is taken from the customer-facing aspect of the front stage to the technical implementation in the back stage. In the following we will develop the model using the customer as the prime stakeholder. The applicability of the model to value propositions for other stakeholders will also be demonstrated.

We employ mathematical modeling to illustrate the relationship among the components. We will also illustrate the applicability of the model with case studies of e-commerce, social network and community social service. In the last section we will illustrate how the VPM could be employed to enhance an innovation method for designing innovative service systems and service system networks.
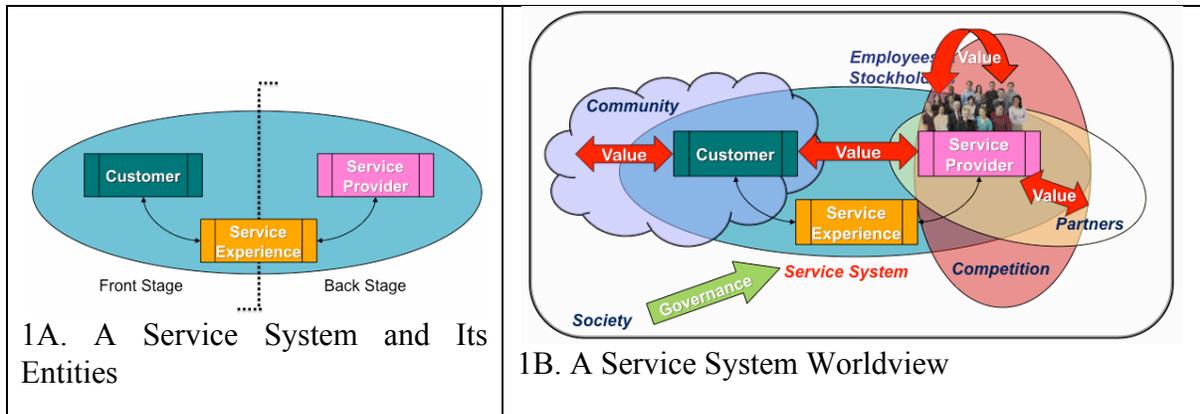
Service Systems and Service System Networks

The Value Proposition Model being developed in this research is based on the *Service System Framework* (SSF) developed in (Kwan & Min 2008). The service system worldview with stakeholders and elemental forms of value propositions from this work are shown in Figure 1A and 1B. A similar view of a service system consisting of collaborations of multiple actors, which contribute tangible and intangible resources to a value co-creation process for providing benefits, is in (Spohrer et al. 2007, 2008; and Vargo & Lusch 2004). The resources could be based on (intangible) information sharing or in (tangible) economic terms (Spohrer et al. 2007 and Glushko 2010).

The value propositions from Figure 1B were extended to include expositions on service system networks that include partners and customer's social network in (Kwan & Yuan 2011). Figure 2 is a composite diagram showing these elements.

We also draw on the Service-Dominant Logic literature in our development of the Value Proposition Model (e.g., the body of work encompassing Vargo & Lusch 2004, 2008, 2009, 2011). Table 1 below summarizes the ten Foundational Premises (FP) of Service-Dominant Logic. The first five FP's are macro in nature and apply to the service sector, economies, trade and exchanges. The last five FP's are micro in nature and apply to the relationship and interaction among the customers, service providers, and network of resource integrators. The VPM under development includes elements that complement FP6-FP10. References to these FP's will be in *superscript* notation.

1A. A Service System and Its Entities

1B. A Service System Worldview

Figure 1. Service System and its Worldview
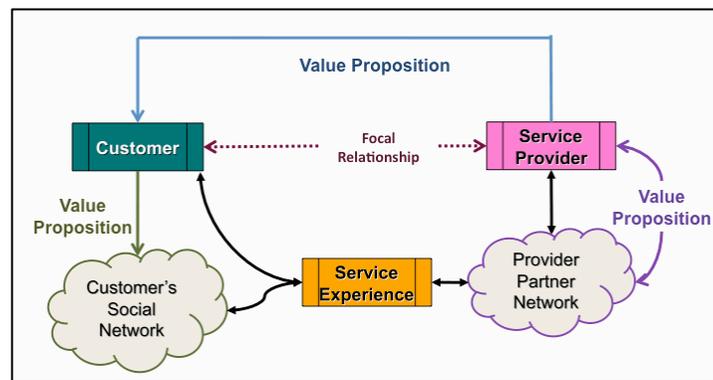
Figure 2. Some Value Propositions in a Service System Network

We also draw on the Service-Dominant Logic literature in our development of the Value Proposition Model (e.g., the body of work encompassing Vargo & Lusch 2004, 2008, 2009, 2011). Table 1 below summarizes the ten Foundational Premises (FP) of Service-Dominant Logic. The first five FP's are macro in nature and apply to the service sector, economies, trade and exchanges. The last five FP's are micro in nature and apply to the relationship and interaction among the customers, service providers, and network of resource integrators. The VPM reported in this paper includes elements that complement FP6-FP10. References to these FP's will be in *superscript* notation.

Macro Concepts

|	Foundational Premise	Explanation & Comment
FP1	Service is the fundamental basis of exchange.	The application of operant resources (knowledge and skills), "service," as defined in S-D logic, is the basis for all exchange. Service is exchanged for service.
FP2	Indirect exchange masks the fundamental basis of exchange.	Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent.

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FP3	Goods are a distribution mechanism for service provision.	Goods (both durable and non-durable) derive their value through use - the service they provide.
FP4	Operant resources are the fundamental source of competitive advantage.	The comparative ability to cause desired change drives competition.
FP5	All economies are service economies.	Service (singular) is only now becoming more apparent with increased specialization and outsourcing.
Micro Concepts		
FP6	The customer is always a cocreator of value.	Implies value creation is interactional.
FP7	The enterprise cannot deliver value, but only offer value propositions.	Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but cannot create and/or deliver value independently.
FP8	A service-centered view is inherently customer oriented and relational	Because service is defined in terms of customer-determined benefit and co-created it is inherently customer oriented and relational.
FP9	All social and economic actors are resource integrators.	Implies the context of value creation is networks of networks (resource integrators).
FP10	Value is always uniquely and phenomenologically determined by the beneficiary	Value is idiosyncratic, experiential, contextual, and meaning laden.

Table 1. Foundational Premises (FP) of Service-Dominant Logic - adapted from Vargo & Akaka (2009).

THE VALUE PROPOSITION MODEL (VPM)

The central premise of the Value Proposition Model is depicted in Figure 3. In order to construct value propositions that are appealing to the customer, the service provider must understand of the customer's value system as well as his own (Vargo & Lusch (2004)'s discusses that the relationship between the customer and service provider is no longer unilateral). Moreover, consideration of the customer's value system is fundamental in order to provide the right value so as to convince customers to select one's service offering (Anderson et al. 2006). A value system is made up of many value dimensions and could be of the customer's self or his stakeholders. Binkjorst for instance states that individual's experience of co-creating is what provides the value as "first-generation experience" through personnel interaction between

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customer and service provider (Binkjorst 2006). Such a service experience can be defined as "the total functional and emotional value of a customer service" (Sandström et al. 2008). In this respect, the value proposition should have both functional and emotional appeal and the service experience (and the value realized) is unique to each individual and unique to each service consumption situation. (Gentile et al. 2007) also suggests that these customer experiences comprise a multidimensionality of experiences, e.g. sensorial, emotional, cognitive, pragmatic, lifestyle, or rational components. As to tangible resources, the service provider will have to cater to the value dimensions the customer is willing to pay for, subscribe to, or accept on some non-economic terms in a manner that provides the value in as much common form as possible. (Keeney, 1999) provides a vigorous discussion of value propositions and value dimensions. The customer's acceptance of a value proposition will, of course, depend on the customer's ability to pay. Factors that have been identified to positively contribute to the willingness to pay are, e.g., perception of convenience, essentiality, added value, and service quality (e.g., for online services in Wang et al. 2005).
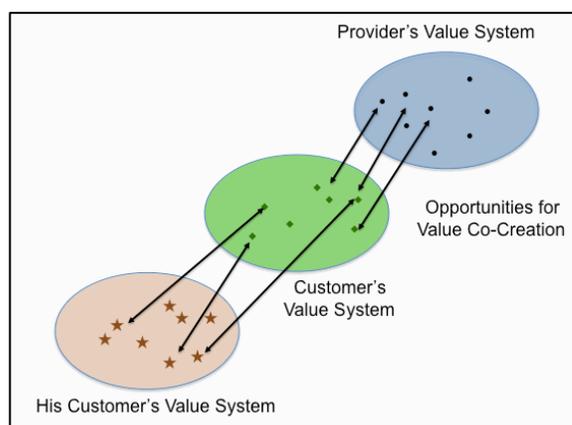
Figure 3. Value Systems and Value Dimensions

Service systems are in general man-made systems designed to improve the quality of life of its stakeholders. Horsky asserts that if the service provided meets customer's needs, there will be a willingness to pay (Horsky 1990). As people's income increase, they are more likely to buy service with their disposable income as a substitute so that they will preserve valuable time and resources to do something else. Figure 3 also shows the situation, such as in B2B commerce, where the service provider could be providing value to the customer's stakeholders. Here, the value proposition of the service provider and its partners could be based on, e.g., client satisfaction, client-vendor relationship, vendor's core competencies (Levina & Ross 2003); service support and personal interaction (Ulaga & Eggert 2006). Other potential value components could be product/service quality and delivery performance, along with acquisition costs and operation costs. Service providers will also have to manage these disparate value systems possessed by the stakeholders by using different value propositions, e.g., offering different services based on value-in-exchange and value-in-use (Kowalkowski 2011).

Value and Value Propositions

The simplest form of customer value is Value = Benefit / Cost[1]. We expand this simple form to represent customer and service provider value in the construction of value propositions in the sequence of *offer, choice, accept, realize, and feedback*[2].

A customer looking for service may be confronted with many *Value Propositions* (*VP's*). Each *VP* is made up of a vector of attributes <u>offered</u> by a *Service Provider* (*SP*)[FP7]:

$$VP_j = [SE, B, C, P, Q, Sc, R, M]_j \qquad (1)$$

where,

$j \in J$ competition and/or substitute product/services
         (Figure 4, cf. Figure 1B)

SE_j *Service Experience* offered by SP_j which is made up of a set of observable or evidential *Service Components*: $SE_j = \{S_{ij}, i = 0, ..., n\}$
         each SE_j can be partitioned into one or more *Service episodes*:

$$SE_j \supseteq Se_{jk}, k = 0, ..., K \qquad (1a)$$

where each *Service episode* could be performed by SP_j and/or his service network partners[3].
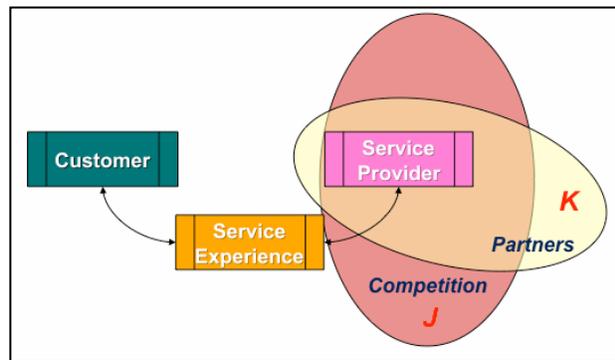
Figure 4. Representation of Partners and Competition in the VPM

$0 \leq B_j$ benefit that SP_j claims the customer could realize from receiving the offered SE_j: $B_j = \{f(S_{ij}) = B_{ij}, i = 0, ..., n\}$ i.e., there is a 1:1 correspondence between each Service Component S_{ij} and its benefit

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[1] This form of value calculation is illustrated in (Carlson & Wilmot 2006). Another way to formulate value is to calculate Net Value = Benefit – Cost (e.g., see Lovelock & Wirtz 2007, page 131). This could be used to avoid the problem when some costs are zero or near zero – i.e. free but not entirely free (e.g., as in monopolist situation or where public services and utilities are concerned, see also Anderson 2008). We are using the simple form here to illustrate the magnitude of comparison between benefit and cost (e.g., Benefit is 3X of Cost).

[2] cf. the Interact/Serve/Propose/Agree/Realize (ISPAR) model in (Spohrer et al., 2008), the discussion of value proposition, acceptance and fulfillment sequence in (Mele & Polese 2011), and the offer/intent/consume/settle/feedback model which reflects the customer's show of browse/intent/buy/pay/concerned behavior (Figure 6 in Kwan & Min 2008).

[3] We will return to the aspect of multiple providers later on in the section.

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$0 \le C_j$ price of SE_j: $C_j = \{c_{ij}, i = 0,...,n\}$

$0 \le P_j \le 1$ the probability of delivering SE_j successfully as claimed by SP_j: $P_j = \{P_{ij}, i = 0,...,n\}$

$0 \le Q_j \le 1$ quality index of delivered SE_j as claimed by SP_j: $Q_j = \{Q_{ij}, i = 0,...,n\}$

Sc schema of information exchange between the customer and SP_j

R rules of behavior expected between the customer and SP_j

M a set of metrics for measuring the performance of the customer and SP_j

Assumptions about the competition, differentiation (set of offerings), and market segmentation (target customers) are not explicitly shown here since they are already represented in the service system framework (Figure 1B)[4].

A customer's Value System[FP8] (B) is made up of a complex set of value dimensions. Some of these dimensions[FP10] are: economic, social, societal, environmental, utilitarian, cultural, political, familial, convenience[5], etc. There are also some dimensions that affect the self[6] such as moral, ethical, hedonic, spiritual, corporal, emotional, intellectual, creativity, psychological, safety, leisure, etc. which could be grouped together as intrinsic value dimensions. Going beyond the self, such as in a B2B environment, a customer might value productivity, ease-of-use, reputation, risk reduction, innovativeness, etc. In some cases, what a customer values is what he can in turn increase the value of his own customers as illustrated in Figure 3[7]. A Value Proposition from a Service Provider will have to be directed at or not counter to some subset of the customer's Value System[8], i.e., $B_j \in B$ in (1). Otherwise, the customer will not see any appeal in the proposition.

Given (1), the <u>offered</u> Value from SP_j based on VP_j can be computed as:

$$V_j = \sum_{i:S_{ij} \in SE_j} \frac{P_{ij} B_{ij} Q_{ij}}{c_{ij}} \qquad (2)$$

where the Value is derived from the probability of success (P_{ij}) in delivering the Service Components, the benefits realized when SE_j is used (B_{ij}) and, the quality of their delivery (Q_{ij}).

Given (2) and J, the customer's <u>choice</u> is SP' that offers the best <u>expected</u> value as:

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[4] The service system framework incorporated the competitive strategy of the classic work of (Porter 1998) and are depicted in Figure 1B and 4.

[5] (Glushko 2010) provided examples of substituting the provision of information for human interaction in transactions at the convenience of the customer. As another example, esurance.com offers insurance quotes to customers by "people when you want them, technology when you don't". http://www.esurance.com/quote826?PromoID=GGLBR06353ea&partner_cd=6073410387&ts=2&tc=2 (retrieved August 11th, 2011)

[6] Some of these intrinsic values are derived from human basic needs such as those described in Maslow's hierarchy of needs.

[7] For example, Cisco Systems, Inc. sells its products and services only through channel resellers.

[8] cf. the concept of resonance in Golinelli (2010).

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$$V^{'} = \max_{j \in J} \sum_{i:S_{ij} \in SE_{j}} \frac{P_{ij}^{'} B_{ij}^{'} Q_{ij}^{'}}{c_{ij}} \tag{3}$$

where we take into consideration that the customer has his own expectations[9]:

$0 \le P_{ij}^{'} \le 1$ is the customer's subjective estimate of probability of success of S_{ij}. This is usually based on the reputation and capability of SP_{j}

$0 \le B_{ij}^{'}$ is the expected benefit, $f^{'}(S_{ij}) = B_{ij}^{'}$, that could be realized from receiving S_{ij}

$0 \le Q_{ij}^{'} \le 1$ is the expected quality index of S_{ij}. Here $Q_{ij}^{'}$ could be considered a discount factor where the customer could realize less than full benefit from S_{ij} if the quality is low. This is again usually based on the reputation and capability of SP_{j} (e.g., see Zeithaml, 1988).

When the customer chooses $SP^{'}$ and accepts $VP^{'}$, we assume that the customer is contracted to pay for $SE^{'}$ as a whole[10]. The actual *V*alue, i.e. value in use, the customer realizes from the performance of $SE^{'}$ is expressed as:

$$V = \sum_{i:S_{i} \in SE^{'}} \frac{\pi_{i} \beta_{i} \theta_{i}}{c_{i}} \tag{4}$$

where

$0 \le \pi_{i} \le 1$ represents whether S_{i} was actually experienced, i.e. the evidence of service[11]. In some cases the service experience is indivisible (no partial performance is possible or allowed), then $\pi_{i} = \{0|1\}$

β_{i} is the actual benefit realized: $f^{''}(S_{i}) = \beta_{i}$

$0 \le \theta_{i}$ is the actual customer quality evaluation of experiencing S_{i}

The index j is dropped from (4) as all notations from this point on refer to the chosen service provider.

In contrast to (1), θ_{i} is allowed to be > 1 in (4). In such a case, the customer is getting more than his money's worth when the quality of the service performed is much higher than expected[12], e.g., a service surprise.

The formulation of value in (4) is similar to what (Zeithaml 1998) proposed as value "… based on perceptions of what is received and what is given." Furthermore, it is in line with

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[9] For example, an educated consumer does not always believe/agree with the Service Provider's (advertised?) assessments in (1).

[10] See (Kwan & Min 2008) for a discussion of the service worldview where the law and order of the society that is home to the service system is depended upon to resolve disputes such as insufficient performance, non-performance, or poor quality of performance (represented as the "governance" pointer in Figure 1B).

[11] (Basole & Rouse 2008) discusses that value of service does not necessarily entail owning the rights to the service transaction.

[12] For example, a customer satisfaction survey question employed by an international hotel chain asked whether the value received by the customer ranged from much less to much more than what was paid (see http://www.cob.sjsu.edu/kwan_s/HyattSurvey.jpg).

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suggestions from (Basole & Rouse 2008) that the customers do not necessarily value the service itself (S_i) but they value the derived benefits (β_i) such as in entertainment, communication, and healthcare.

To summarize (1) to (4) above, we have developed the model for the construction of value propositions in the sequence of *offer, choice, accept, and realize.* $V - V^{'}$ (from (3) and (4)) is thus the **gap** between actual and expected Value the customer realizes from $SE^{'}$ by choosing $SP^{'}$. We will expand the model to take into consideration of *feedback* in a later section where the service provider side of the value proposition construction is modeled. The *Sc, R* and *M* components of this model are to be developed in the next stage of this research.

Value Co-creation and Value Co-production

In the following, (5) is an ***example*** of (4) further refined to incorporate a) the participation of both the *c*ustomer and *S*ervice *P*rovider in co-creating value; b) $SE^{'}$ is delivered by more than one *S*ervice *P*rovider.

$$V = \sum_{\substack{i:S_i \in Se_k^{'} \\ k:Se_k^{'} \in SE^{'}}} \frac{\pi_{i,c}\beta_{i,c}\theta_{i,c}}{c_{ic}} + \frac{\pi_{i,k}\beta_{i,k}\theta_{i,k}}{c_i} \tag{5}$$

where the *c* index refers to the *c*ustomer's contribution to the value component. $Se_k^{'}$ is a *S*ervice *e*pisode partitioned from $SE^{'}$. The *k* index in the numerator of (5) enumerates through various *S*ervice *P*rovider's contribution to the value component (which includes $SP^{'}$ and his partners, i.e. the resource integrators [FP9]). The numerators in (5) is the formulation of *Value Co-creation*[FP6]. The π evidence factor is also decomposed in its *c* and *k* components to illustrate the concept of *Service Co-production*. For example, if the customer did not perform as expected in a particular Service Component[13], then $\pi_{i,c}$ could be 0 and the corresponding $\beta_{i,c}$ is not realized. The same decomposition is applied to the quality index since each participant is evaluated on his own performance. In this example the denominators are separated to illustrate that C_i is incurred as the cost of paying for the service while C_{ic} is the cost incurred by the customer to co-produce the value of the service (e.g., time, etc.) Figure 5 illustrates the above. In the example, $SE^{'} = \{S_1, S_2\}$ and $SP^{'} = SP_0$. The value creation for the *S*ervice *P*rovider as shown in Figure 5B will be discussed in a later section.

Value for the Service Provider

From (5) as illustrated in Figure 5B, the value realized by the customer by receiving the service can be calculated. It is less obvious what value the service provider will receive from (5) other than the price the customer paid as settlement for the service. To begin with, it is the

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[13] See (Freund & Kwan 2010) for a discussion of expected customer performance in a service co-production environment.

service provider who formulates (1) and thus he must build the value proposition based on what is attractive to the customer as well as generate value in return.
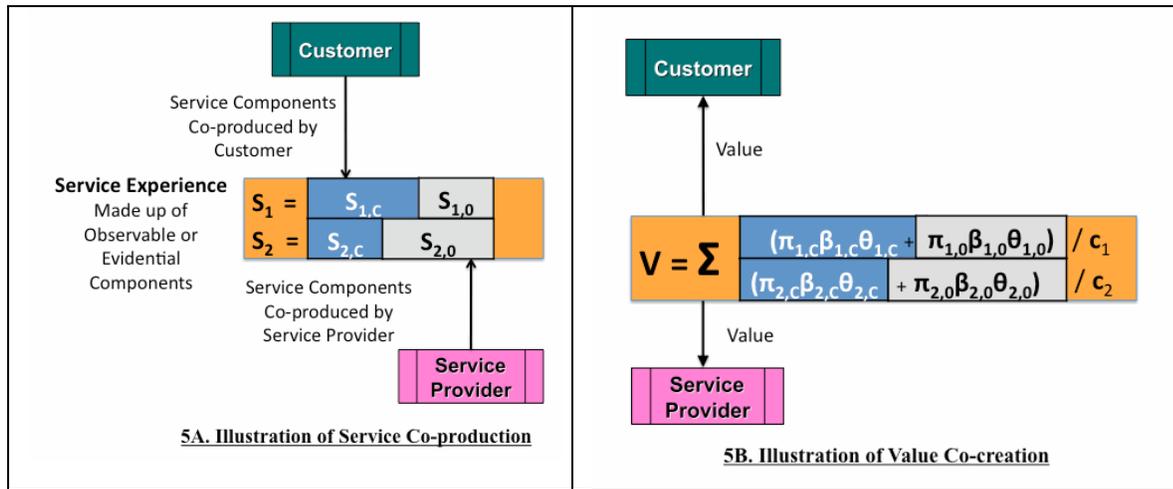
Figure 5. Illustrations of Service Co-production and Value Co-Creation

The direct return in value to the service provider could be from collecting the price from the customer or in the case of subcontracting/partnering, cashing in on the present-value worth of the service by selling longer term contracts or reduce costs by methods such as labor arbitrage.

The service provider could reap indirect return in value by incorporating his own Key Performance Indicator (KPI) into (5). This is indirect because there is no collection of value at the point of service but the value is gained from the *feedback* that is provided by the customer. The feedback from the customer is invaluable in helping the service provider in improving and growing his business. The ability for the service provider to gain value from the customer's feedback on the performance of the service in order to reduce the gap between the actual and expected value the customer realizes is already provided for in the formulation of the VPM. This will be shown in the later section on Constructing Value Propositions.

SERVICE PATTERNS

In this section, the temporal dimension is used to integrate the Value Proposition Model (offer/choice/accept/realize/feedback) and Service System Network (the environment) from the previous two sections into a variety of familiar Service Patterns in a dynamic environment[14]. These Service Patterns are used to describe some common occurrences of interaction in time between the customer and service provider(s) in the "realize" stage of the VPM.

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[14] See Badinelli (2010) for a discussion of resource allocation for service systems where the temporal dimension is represented in a stochastic model.

These dynamic Service Patterns are illustrated in Figures 6A-E. We adopt the notation of SP_0, SE_0, and VP_0 to indicate the *primary Service Provider* who offers the *primary Service Experience* based on the *primary Value Proposition* (the *SE*'s are illustrated with their corresponding *VP*'s in the Figures). The emphasis here is on the Focal Relationship between the Customer and the *primary Service Provider*, i.e., the *VP* offered and accepted is the contract in effect (Kwan & Yuan, 2011). There could be other *Service Providers*, *Service Experience*, and *Value Propositions* involved when we consider more complex examples of partnerships, sub-contracting, etc. in some of the Service Patterns. Figure 6A illustrates the Pattern of a *Service Experience* (with a single *Service episode*) that happens at a particular point in time involving only the customer and the *primary Service Provider*.
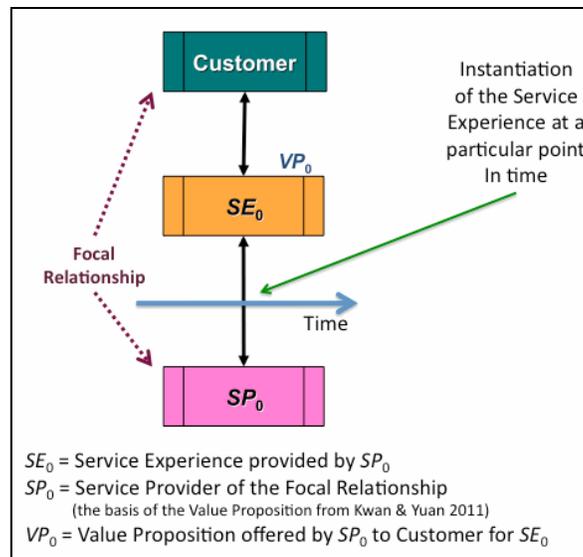
Figure 6A. Service Pattern 1 – Single Service Episode

Figure 6B illustrates the Service Pattern where the *Service Experience* spans over a period of time. When a *Service Experience* is enjoyed over a period of time, the value produced in (5) might have to be accumulated over time. This could be represented by specifying *Service episodes* in (1a) that could be consumed at various instances during the period of time that the *VP* is in effect. In some cases, more than one *Service episode* could be comprised of the same subset of Service Components that are to be consumed at different point in time. Another possible interpretation of these *Service episodes* is that some of them could be variations of the same service component but implemented differently. For example, a bank customer could choose whether they want online access to the service, call to a call center, or interact with a service employee. Each of these options could be presented as a different *Service episode* to the customer and he could choose a particular one for a particular instance, which could result in

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similar benefit but with different cost and quality implications. Glushko suggests that customers should be given the choice of receiving information instead of human interaction in certain service encounters (Glushko 2010). Customer choices and self service experience were also considered on the benefit side of the equation in (Kwan & Yuan 2011).
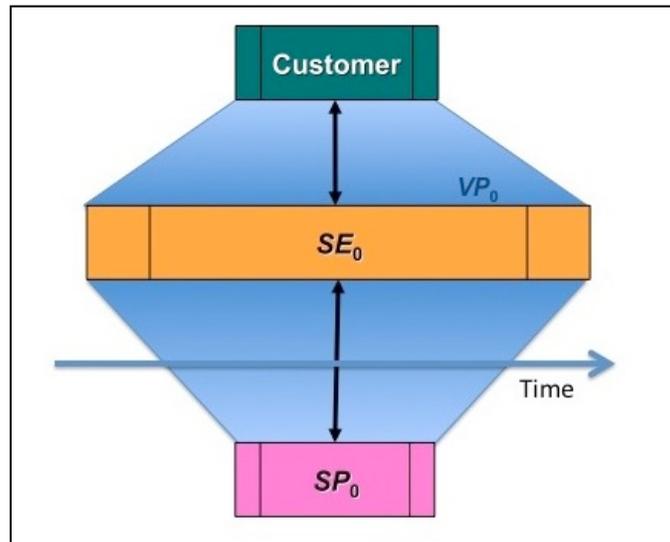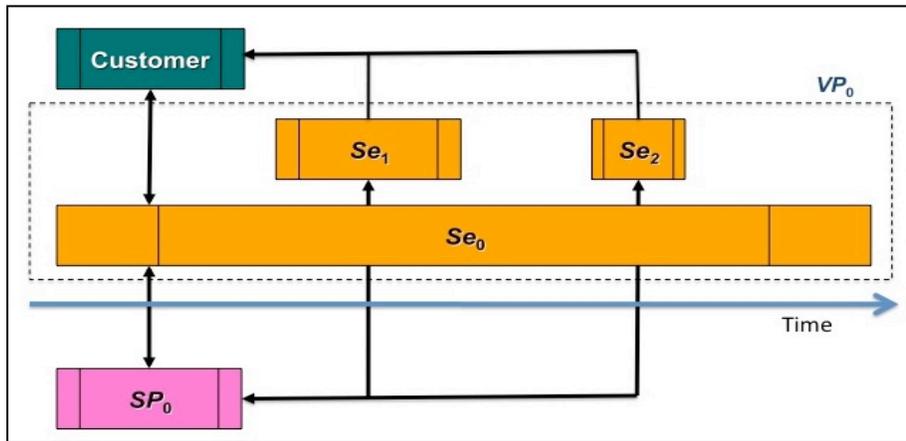

Figure 6B. Service Pattern 2 - Continuous Service over a Period of Time
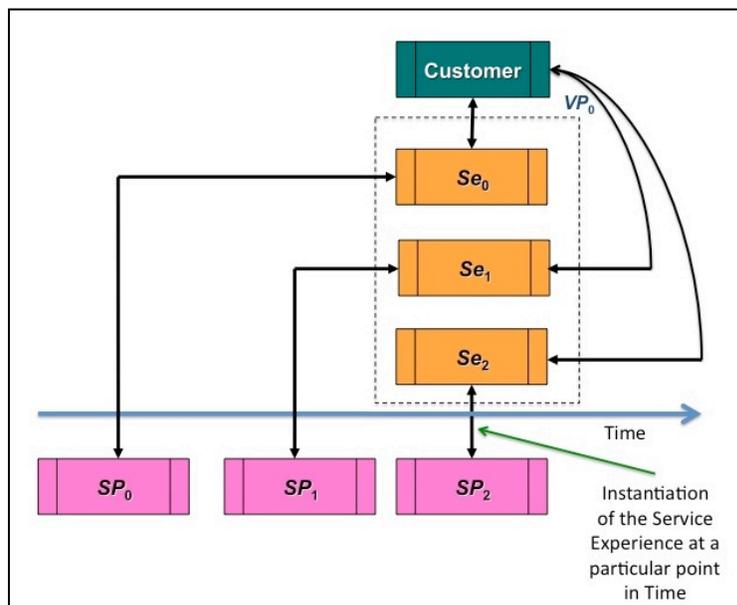

Figure 6C. Service Pattern 3 – Service in Parallel

Figure 6C illustrates the Service Pattern where the primary Service Provider subcontracts some of the Service Experience ($SE=\{Se_0,Se_1,Se_2\}$) to two other Service *P*roviders (SP_1, SP_2)

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which in turn provide, in parallel, their contribution of *Service episodes* (Se_1, Se_2) at a particular point in time. Note that in this example, SP_0 and the two subcontractors are all operating under VP_0 as contracted by the customer with SP_0. See Figure 6E for more details about the relationship between SP_0, SP_1, and SP_2 involving their own *VP*'s and *SE*'s. Figure 6D illustrates the Service Pattern where the primary *Service Provider* is contracted to provide a *Service Experience*, Se_0, over time as well as occasional additional *Service episodes* (Se_1, Se_2) when needed.

Figure 6D. Service Pattern 4 – Continuous Service with Occasional Service Episodes
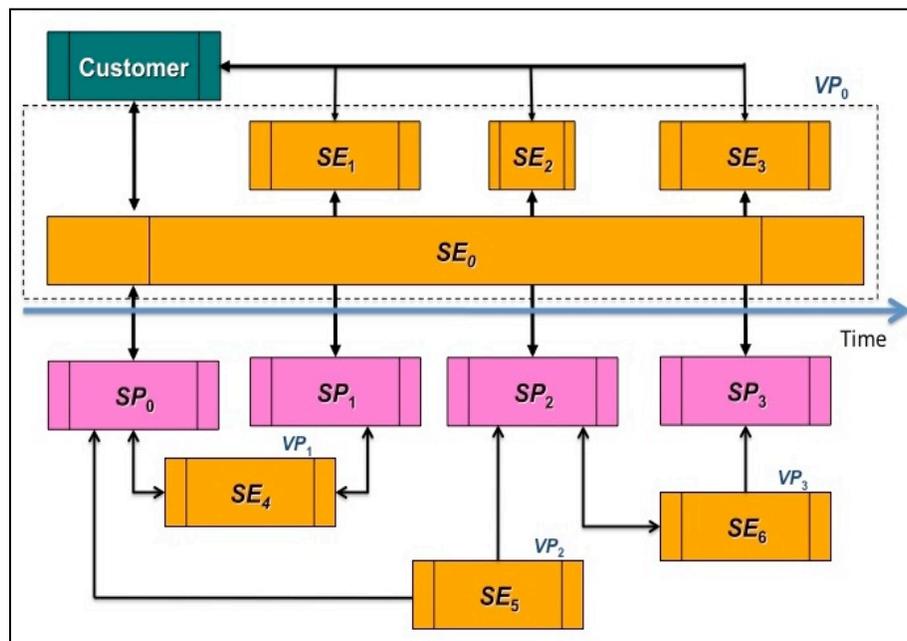
Figure 6E. Service Pattern 5 – Service Provided by Multiple Partners

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In contrast to Figure 6D where the primary *Service Provider* is the only Provider, Figure 6E illustrates the case where multiple *Service Providers* are involved. The *Service Experience* provided by these *Service Providers* could be in parallel or in series.

In this pattern $(SE_0,...,SE_3)$ are provided based on the original VP_0. Each sub-contractor/partner of SP_0 provides the SE's based on their own agreement with SP_0. That is, each SP accepts the *Value Proposition* (VP_1,VP_2,VP_3) from SP_0 to provide the *Service Experience* to the Customer. These SP's are stakeholders in this illustration of a Service System Network (called Provider Partner Network in Figure 2). In some cases SP_0 subcontracts SE_0 by selling the contract to partners at a discount so as to get cash in hand. In other cases, SP_0 could create derivatives from the original contract and sell them to the partners. For example, Value Added Resellers (VARs) sell hardware and software as a package to the customer and then sell the software maintenance part of the contract to third party vendors who will then service the customers over the length of the contract. In some cases these subcontractors are not identified and do not have any interaction with the customer except the last. In that case, the customer can only evaluate that particular interaction since the intermediaries are not visible to him.

Another example of this pattern is a "customer's health journey" in a healthcare environment. Figure 6E can be seen as a depiction of a customer who receives healthcare services from a Health Maintenance Organization (HMO). The customer, a patient in this case, subscribes to the HMO with VP_0. He receives continuous monitoring (SE_0) by his primary healthcare provider (SP_0) and then occasional care when needed (SE_1, SE_2, SE_3) by nurses, specialists, therapists, and others (SP_1, SP_2, SP_3). This pattern is very versatile and many real-life service systems exhibit this pattern of behavior. Another example is the case of mobile phone services where the customer is charged a fixed amount for the monthly service as well as periodic services such as roaming charges, long distance calls, data transfers, etc. A detailed example of an e-Commerce scenario exhibiting this pattern is presented in Appendix A.
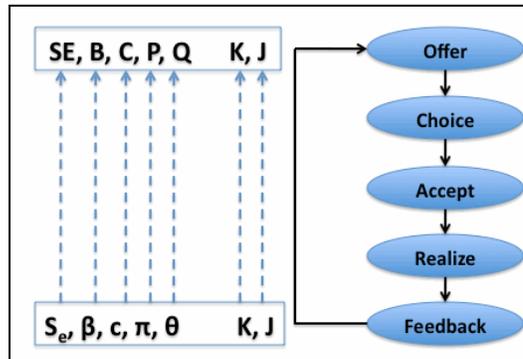
CONSTRUCTING VALUE PROPOSITIONS

Given the derivations of the VPM above, the service provider must take into consideration the components from (1) in order to construct effective Value Propositions for the customer (see Table 2). The effectiveness of the Value Propositions will depend on how well the Service Provider understands the needs of the Customer and provide the appropriate and competitively priced service offerings, provision the internal and external capabilities and deliver quality service, and how well these are aligned with his own KPI's.

SE	Developing and honing the competencies to deliver the Service Experience made up of service components which could be instantiated as service episodes
B	Understanding the stakeholder's value system with its many dimensions in order to offer them relevant value components that they would buy

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C	Setting the right price for the service in a competitive environment
P	Improving the confidence of the customer on the provider's ability to delivery
Q	Improving and maintaining the quality of the delivered service
as well as the competitors and partners:	
J	Understanding the competition and differentiate the service offering from them
K	Developing a network of partners with the right competencies

Table 2. Value Proposition Components

Figure 7. Feedback loop for constructing Value Propositions

Figure 7 illustrates the importance of customer feedback in the construction of Value Propositions. Some service providers are willing to provide cash, lottery or other incentives to entice customers to provide feedback of their performance. The feedback should be based on the customer's realized value from the service experience as well as the performance of the service providers/partners and the customer himself as shown in (5) which in turn could help the service provider improve (1).

Case Studies

Three examples of applying the Value Proposition Model are given in the Appendices:
A. E-Commerce – Amazon.com
B. Social Network - Facebook
C. Community Social Services – London Borough of Sutton

These examples illustrate the flexibility and applicability of the VPM in many commonplace scenarios.

FUTURE DIRECTIONS

In this research we have extended existing models of value in the service science literature by creating a model for constructing effective Value Propositions using a mathematical model that can be applied to the stakeholders of a service system network. We have also demonstrated the model's efficacy with examples taken from the current business environment.

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We believe that this approach is an important and integral part of the foundation for the design of successful service system networks.

　　Future avenues of research include a more in-depth study of the value dimensions so that they could be measured more easily. The VPM can also be enhanced with a more robust treatment of the service provider's incorporation of his own KPI's in the value proposition. The service system, network, and value framework of (Kwan & Yuan 2011) has been successfully integrated with the Foresight and Innovation Method[15] for creating the design of innovative service systems[16]. It is the intention of the authors to incorporate the Value Proposition Model as the foundation of a Business Model (see Figure 8) to strengthen the robustness of the method in applying design thinking to the design of innovative service systems.
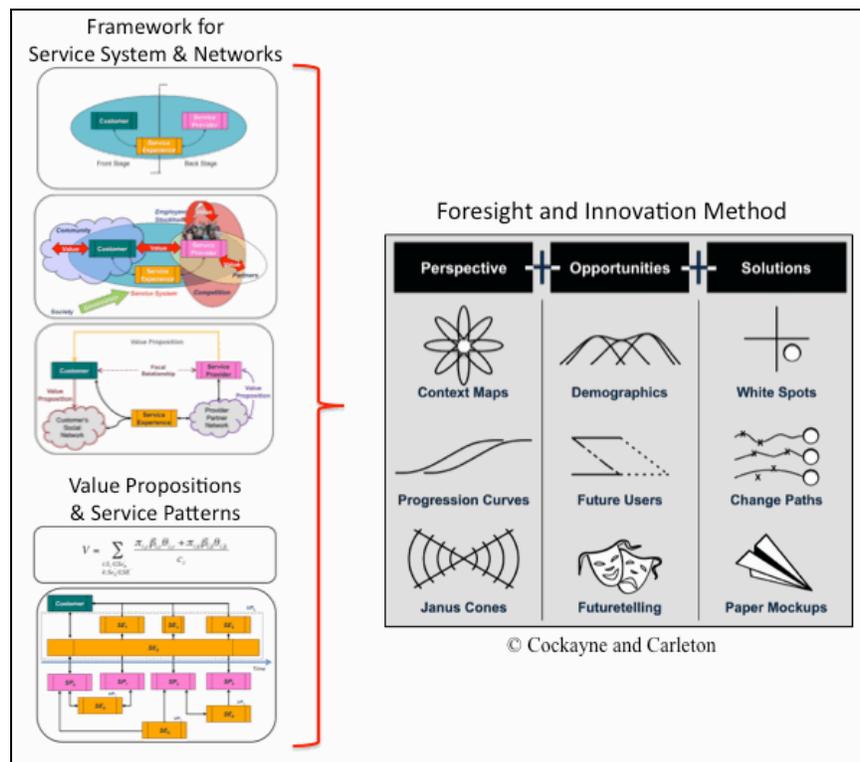
Figure 8. Incorporating the VPM with the Foresight and Innovation Method.

　　Another area for future research is in integrating the VPM into the prototyping process of designing service systems. The delineation of front stage and back stage of a service system is already built-in as shown in Figure 1A[17]. This together with the separation of service co-production between customer and service provider in (5) and the Service Patterns align the VPM easily with prototyping methods such as Service Blueprinting, modeling using UML (Unified Modeling Language) and BPMN (Business Process Modeling Notation), Work System

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[15] The Foresight and Innovation Method: http://foresight.stanford.edu

[16] Kwan had used this method successfully in classes and workshops in multiple cultural and regional environments. Both authors participated in the Service Summer 2010 - http://www.ksri.kit.edu/Default.aspx?PageId=729&lang=en

[17] See (Kwan & Hefley 2008) for a presentation of this delineation about IT service support of service systems.

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modeling, etc.[18] The research in this area will be directed at preserving the customer-oriented thinking in the design process and carry it through the prototyping process and into implementation of the service system.

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[18] For example, as replacements for the "Paper Mockups" of the Foresight and Innovation Method in Figure 7.

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APPENDIX A – EXAMPLE OF A SERVICE SYSTEM NETWORK: E-COMMERCE

We have shown an example of a service system network[FP9] in Figure 2. A customer's interaction with the service provider could be direct or indirect, i.e., through one or more partners of the service provider. Figure A1 shows an example of a service system network where a customer of an online retailer interacted with multiple subcontractors (called affiliates in this case) in parallel in a transaction. In this case, the customer bought one book from each of the affiliates.

In this example:

SP' = SP_0 = Amazon.com

K = 4 $\quad\quad n = 6$

SP_1=Bookcloseout_us SP_2 = theBookGrinder

SP_3=nengland4 $\quad\quad SP_4$ = USPS

SE = $\{S_0, S_1, S_2, S_3, S_4, S_5, S_6\}$

= $\{Se_0, Se_1, Se_2, Se_3\}$

= $\{\{S_0\}, \{S_1, S_4\}, \{S_2, S_5\}, \{S_3, S_6\}\}$
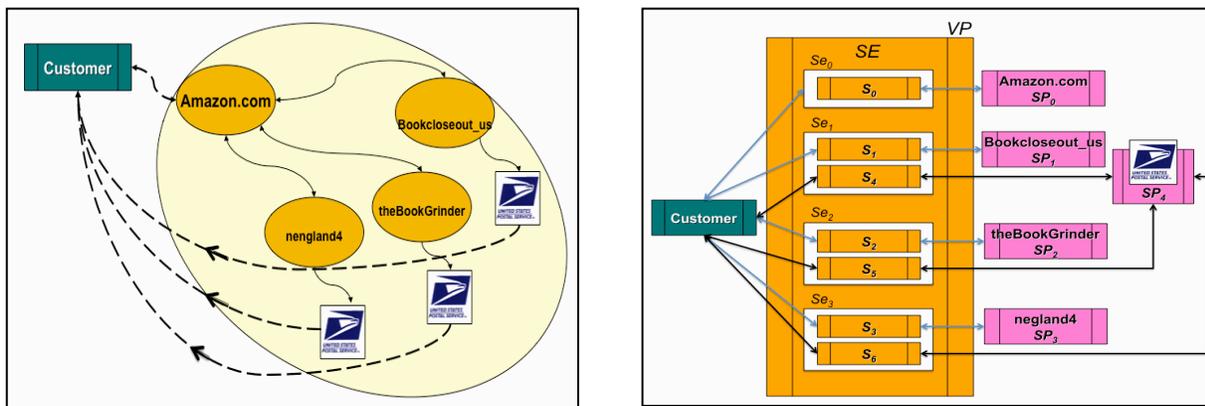
Figure A1. An example of Parallel Service Providers in a Service System Network (shown in pictorial format and in VPM notations).

In this example of parallel service providers the customer has a touch point with each of the affiliates even though the original transaction was initiated with Amazon.com. Thus the customer's *Service Experience* under the *VP* from Amazon.com is the culmination of his

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experience (the *Se* made up of Service Components) with each of the affiliates as well as with the US Postal Service that provided the deliveries.

We have only shown the *S*ervice *E*xperience of the customer under the Value Proposition. There were, of course, other *VP*'s and their corresponding *SE*'s in place between Amazon.com and the affiliates and between them and the US Postal Service.

APPENDIX B - EXAMPLE OF A SERVICE NETWORK: SOCIAL NETWORK

The Value Proposition Model is applied to Facebook, a social network company. Figure B1 shows the pictorial of how Facebook provides service experience to its customers, its partner/customer and in turn their customers.
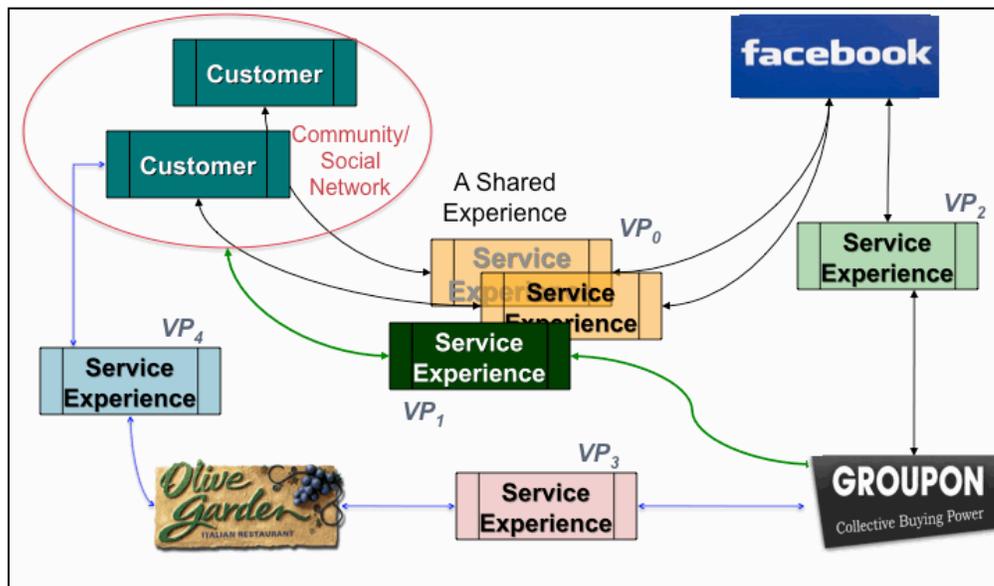
Figure B1. An example of applying the VPM to a social network example.

Facebook provides the platform for its users[19] to connect to their friends in a variety of ways and activities. The Value Proposition from Facebook to provide a shared experience (see overlapping Service Experience in Figure B1) to its users, VP_0, is to individuals as well as the community made up of the users. Facebook also provides access to this large pool of users to its customers such as Groupon by offering them Value Propositions such as VP_2. If the customer accepts then he can use the Facebook platform to provide his own Service Experience based on his own Value Proposition, VP_1. In this case, Groupon can offer Facebook users daily local and

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[19] According to "People on Facebook" in http://www.facebook.com/press/info.php?statistics (retrieved September 11, 2011) there are more than 750 million active users; 50% of the active users log on to Facebook in any given day; average user has 130 friends and people spend over 700 billion minutes per month on Facebook.

online deals in the form of redeemable discount coupons. This is depicted as part of the shared experience that Facebook aggregates for the users on its platform. Note that the offer of service from Groupon is depicted as directed at the community and not as a service to an individual until the user accepts the offer.

A Facebook user could opt to click on a Groupon offering and receives a coupon (for example, from Olive Garden, a restaurant chain) by email. In this case the user could reap the benefit of getting a discount meal and Groupon will receive payment from Olive Garden (as a customer) if the user uses the coupon for purchases. This is depicted as the Service Experience under VP_3 between Groupon and Olive Garden. Finally when a user uses the coupon with Olive Garden he, in effect, accepts VP_4 and becomes a customer of Olive Garden and enjoys the Service Experience conducted by the restaurant (outside the Facebook platform). Note that VP_4 is directed at an individual customer since the presentation of the coupon opportunity is usually based on some of a customer's preferences, "likes", a friend's recommendation, and/or other activities. This scenario is just a variation of Service Providers trying to acquire new customers through various channels such as newsprint, online advertising, and now social network platforms.

APPENDIX C – EXAMPLE OF A COMPLEX SERVICE SYSTEM: THE CASE OF LONDON BOROUGH OF SUTTON

This example is from (Andreu et al, 2011). It describes the London Borough of Sutton and its Safer Sutton Service Partnership in its attempts to reduce the fear of crime in the community. The case is quite complex because it involves many stakeholders and the inter-relationship among them. In this Appendix we are modeling an aspect of the relationship as depicted in Figure C1.
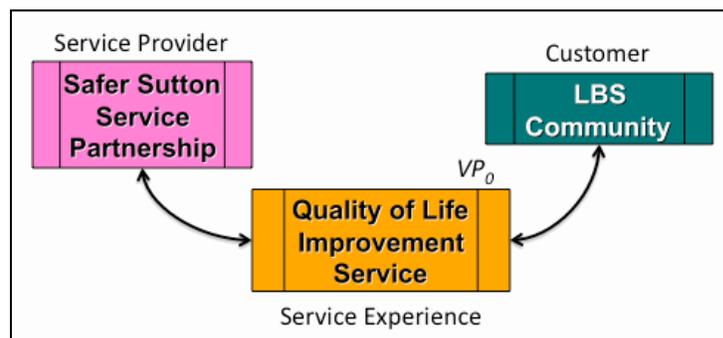
Figure C1. Safer Sutton Service Partnership as a Service System.

The Safer Sutton Service Partnership is nominally the Service Provider in providing Quality of Life Improvement Service, *SE*, to the community. This Service is made up of Fairer, Greener, and Safer Service Components. The Partnership plays the role of a coordinator (aggregator) that works with various Partners to actually carry out these Service Components (*Se*). A disaggregated view of the service system is depicted in Figure C2.

The Safer Neighborhood Teams and the Sutton Neighborhood Watch Association work closely together to perform the Safer Service Components to Prevent (crime), Assist (authorities), Reduce (crime), and Improve (safety).

The Customer in this case is the London Borough of Sutton community that is made of residents and businesses. As in other community-based service systems, some of the Service Provider Partners (such as the Sutton Neighborhood Watch Association) are also Customers themselves.

The customers have various touch points with different Service Providers and experience different types of Service Components. The three Service Components consist on different Service episodes provided to the various Customers. For instance, the "Fairer Service Components" comprise of Service episodes facilitating access to broad range of universal services available in LBS, dedicated support in terms of health (e.g. improved health programs), or dedicated support in terms of social care, e.g. reducing educational attainment gaps. The "Greener Service Components" comprise of cleaning services, textile collections, and other Service episodes such as public transportation. Finally, the "Safer Service Components" comprise of Service episodes such as instances of specific police initiatives, offered options for reporting crime and incidents etc. (e.g. calling 999, online reporting).
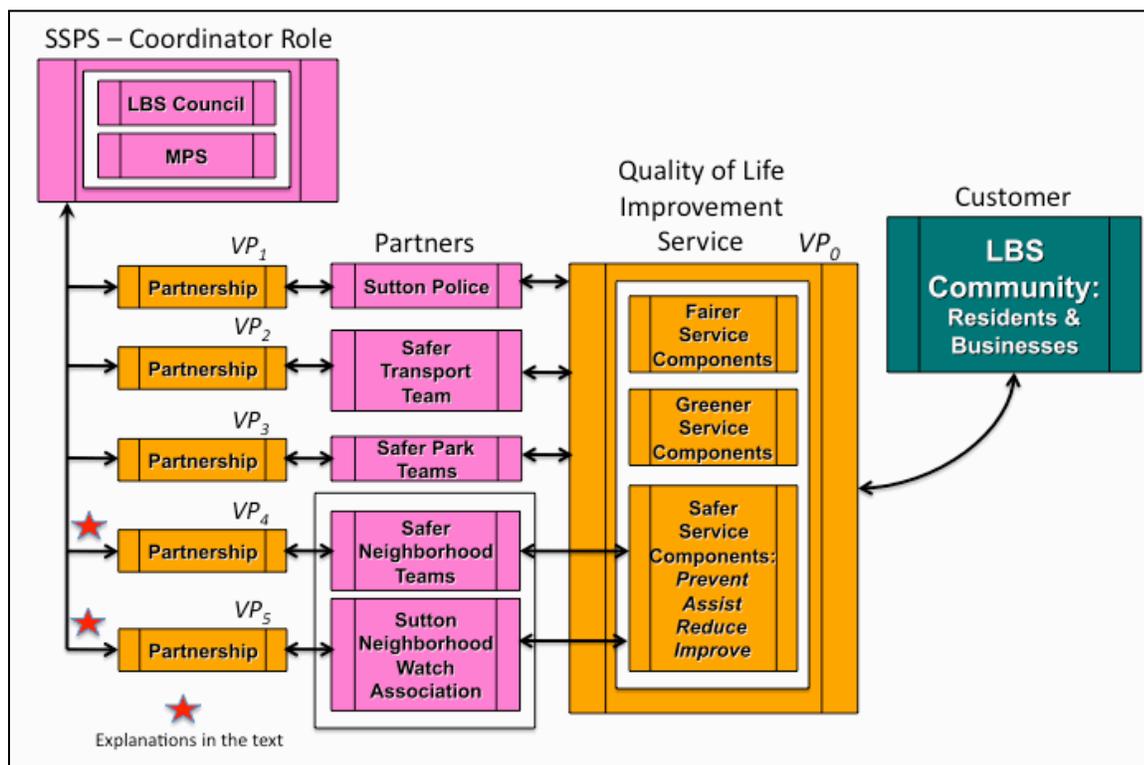
Figure C2. Safer Sutton Service Partnership as a Complex Service Network.