A unified framework for the design of service systems

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Abstract: The paper proposes a co-production approach and develops a unified framework for the design of service systems. Co-production approach not only considers customer as co-producer with the presence of customer inputs in a service process, but also attempts to conduct objective tradeoffs between firm and customers. The unified framework for the design of service systems is developed under the co-production approach. The services are classified based on two dimensions of service and process including service customisation and customer participation. The interrelationships among customers, service concept and service delivery design are explored and the service strategy is integrated into service delivery strategy. The paper contributes general principles and theoretical models for the design of service systems.

Keywords: co-production approach; service system; service design; service classification; service strategy; service delivery strategy.

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1 Introduction

The service industry plays an important role in structural transformation of the economy in many countries with increasing contributions to gross domestic product (GDP). Moreover, a trend toward the integration of goods and service into a single offering implies that production must be redefined as the creation of a combined product of goods and services (Johansson and Olhager, 2006). However, there are relatively few studies in literature on service operations management (SOM), in which a major challenge is to find general principles that guide the design of service systems (Ponsignon et al., 2007).

The design of service systems is an important strategic issue since it allows a firm to transform its strategy onto the operational decisions (Roth and Menor, 2003), and that the effectiveness of operations strategy is contingent upon making the right design choices (Heskett, 1987). In literature, three generic approaches are used to guide service system design. The earliest approach is the production line approach proposed by Levitt (1972, 1976) which focused on improving system efficiency by applying manufacturing principles to the service delivery process. Chase (1978, 1981) suggested the customer contact approach which divided the service system into front office and back office, aiming to improve both service quality in the front office and efficiency in the back office. The unified service theory (UST) (Sampson and Froehle, 2006) stated that the presence of customer inputs is a necessary and sufficient condition to define a production process as a service process. According to the UST, service processes are distinguished from non-service processes only by the presence of customer inputs and implications.

Even many earlier researchers have attempted to develop conceptual frameworks for the design of service systems, but theory and practice still remain disconnected due to lack of a theoretical background that provides general principles to guide the design of service systems. The challenge is to create an innovative idea that can be used in this effort.

For this motivation, this paper proposes a co-production approach as an extension of operations management principles, and develops a unified framework for the design of service systems. The co-production approach not only views customer as co-producer with the presence of customer inputs in a service process, but also attempts to conduct strategic tradeoffs between firm and customers. In this paper, the co-production approach is employed to develop the unified framework for the design of service systems that explores service strategy triad with theoretical models that integrates service strategy into service delivery strategy.

2 Review on service system design

The design of service system is one of the most interested topics in SOM. This design can be approached in three generic approaches: production line approach (Levitt, 1972; Levitt, 1976); customer contact approach (Chase, 1981; Chase and Tansik, 1983); and UST (Sampson, 2001; Sampson and Froehle, 2006).

2.1 Production line approach

Levitt (1972, 1976) suggested that service firms may improve their quality and efficiency by adopting a technocratic approach rather than a humanistic approach. By restricting the human factor, service firms were to notice an immediate reduction in the production
variety, thereby affecting the customers’ notion of quality received. The production line approach would enable a redesign of the service performance itself and promote the creation of new tools, processes and organisational models. Taking inspiration from companies such as McDonald’s arguably exhibits better application of manufacturing principles to service that embodied in McDonald’s operation including:

1. standardising and reducing the variety of products
2. simplification, standardisation and automation of processes
3. monitoring and control of process performance.

A service taking this production line approach could gain a competitive advantage with a cost leadership strategy. However, the production line approach failed to take the very essential component of change (Bowen and Youngdahl, 1998) and the ability to quickly adapt to change in the market (Lashley, 1999) into considerations.

### Table 1  Service classification and positioning strategy

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Framework and dimensions</th>
<th>Service classification and positioning strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chase (1981)</td>
<td>Amount of customer contact in service process from high contact to low contact</td>
<td>Pure service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hybrid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quasi manufacturing</td>
</tr>
<tr>
<td>Schmenner (1986)</td>
<td>Two dimensions of service process matrix based on:</td>
<td>Professional service</td>
</tr>
<tr>
<td></td>
<td>- Degree of labour intensity</td>
<td>Service shop</td>
</tr>
<tr>
<td></td>
<td>- Degree of customer contact and customisation</td>
<td>Mass service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service factory</td>
</tr>
<tr>
<td>Silvestro et al. (1992)</td>
<td>Service process model based on:</td>
<td>Professional service</td>
</tr>
<tr>
<td></td>
<td>- Volume of customer processed on horizontal axis</td>
<td>Service shop</td>
</tr>
<tr>
<td></td>
<td>- Six process dimensions on vertical axis</td>
<td>Mass service</td>
</tr>
<tr>
<td>Kellogg and Nie (1995)</td>
<td>Two-dimensional positioning matrix based on:</td>
<td>Service positioning strategy on the diagonal from differentiation to cost</td>
</tr>
<tr>
<td></td>
<td>- Service package structure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Service process structure</td>
<td></td>
</tr>
<tr>
<td>Tinnilä and Vepsäläinen (1995)</td>
<td>Service process analysis (SPA) matrix based on:</td>
<td>The effective positions on the diagonal from transaction cost to production cost</td>
</tr>
<tr>
<td></td>
<td>- Type of services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Type of service channel</td>
<td></td>
</tr>
<tr>
<td>Collier and Meyer (1998)</td>
<td>Service positioning matrix based on:</td>
<td>Service positioning strategy on the diagonal from customer routed to provider routed</td>
</tr>
<tr>
<td></td>
<td>- Service encounter activity sequence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Number of service system pathways</td>
<td></td>
</tr>
</tbody>
</table>
2.2 Customer contact approach

The customer contact theory (Chase, 1981; Chase and Tansik, 1983) emphasises the physical presence of the customer in service operations. The customer contact approach has the most influential paradigms in the service operations literature (Cook et al., 1999; Chase and Apte, 2007), and most process dimensions highlighted in service frameworks relate to customer contact issues (Metters and Vargas, 2000). Table 1 summarises service classification and positioning strategy. The strength of this theory is to guide the design decision to ‘decouple’ work between the front office and the back office in a service process. The front office has been described as ‘where the customers are’, while the back office is not directly involving the customer. The customer contact approach aims to improve both service quality in the front office and efficiency in the back office. Although decoupling is trying to reduce the complexity of service processes, but it does not always correspond to real-life situation (Zomerdijk and Vries, 2007). The customer contact model states that the potential efficiency of a service system is a function of the degree of customer contact from high contact to low contact. In particular, the lower the customer contact, the greater the system efficiency. Conversely, the higher the customer contact, the smaller the system efficiency. Even when the customer contact implies the physical presence of customer in the service delivery system and subsequent researchers have attempted to define service process dimensions in their service typologies, these dimensions are generally difficult to measure and interpret.

2.3 Unified service theory

Sampson and Froehle (2006) proposed a unified service theory (UST) that defines a production process as a service process if one can identify the presence of significant customer inputs in the transformation process. The UST considers the unit of analysis to be the process, and the production system includes service processes with customer inputs and non-service processes without customer inputs. According to the UST, customer inputs are the root cause of the unique issues and challenges for service management. Therefore, service processes are fundamentally and managerially different from non-service processes. A major assertion of the UST is that the process design dimensions are directly related to a classification of customer inputs or the treatment of customer inputs (Sampson and Froehle, 2006). Thus it is possible to gain insight into process design by analysing the nature of customer inputs to the service system. This provides a framework which extends beyond the boundary limitations of the previous work which has predominantly focused on customer presence (Ponsignon et al., 2007). Although the UST provides a convenient framework for analysing design issues for service processes through value-creation input/output model with the presence of customer inputs, the UST has neither defined measurement of customer inputs and service outcome, nor conducted strategic tradeoff between firm and customers in service delivery systems.
3 Theoretical background on co-production

The earlier approaches are still in the domain of traditional operations and lack of a theoretical background on service operations. Thus, it is necessary to address a co-production approach as an extension of SOM. The co-production approach has key features as follows:

3.1 Customer as co-producer

Co-production involves a mixing of the productive efforts of firm and customers that may occur directly with coordinated efforts or indirectly through related efforts (Parks et al., 1981). The unified services theory (Sampson and Froehle, 2006) stated that the presence of customer inputs is a necessary and sufficient condition to define a production process as a service process. Production function represents the relationship between production output ($Q$) and allocation of production inputs including firm capital ($K$) and firm employee ($H$). The best known functional form for a production function is so-called Cobb-Douglas production function as follows:

$$Q = f(K, H) = A \times K^\alpha \times H^\beta$$

where $A$ is the average or mean productivity, $\alpha$ and $\beta$ are elasticities of input factors. Since customer is treated as co-producer, customer inputs ($L$) should be included in the following co-production function:

$$Q = f(K, H, L) = A \times K^\alpha \times H^\beta \times L$$

The stringiest assumption in the Cobb-Douglas production function is that production inputs and output are homogeneous. Meanwhile, heterogeneity is one of the important characteristics of service, in which heterogeneity in processing and outcome is primarily caused by heterogeneity in process inputs, especially customer inputs (Sampson, 2001). Since production unit in service is a process with heterogeneity (instead of a product with homogeneity as in manufacturing), by defining process inputs and outputs by physical units and assigning with the prices, the aggressive production function can be kept homogeneous that can expand to multiple inputs/outputs process.

The co-production approach not only views customer as co-producer with the presence of customer inputs, but also conducts strategic tradeoffs between firm and customers. While the traditional approach conducts the cost function in the form of $F = w_K \times K + w_H \times H + w_L \times L$ where, $w_K$ and $w_H$ are unit costs of firm capital and firm employee, the co-production approach conducts an objective tradeoff between cost function and utility function, in which the utility function is given as $U = w_Q \times Q - w_L \times L$. Where, $Q$ is service outcome and $w_Q$ is a unit value of service outcome. The co-production approach identifies optimal combinations of ($U^*$, $F^*$) that represents an objective tradeoff between total utility and total cost.
3.2 The service is the process

A service can be described as an outcome, ‘what a customer receives’, a service can also be described as a process, the manner in which the service outcome is delivered to the customer (Mohr and Bitner, 1995). Service outcome has four fundamental characteristics that distinguish them from manufactured goods: intangibility, heterogeneity, perishability, and inseparability (Sasser et al., 1978; Zeithaml et al., 1985). In addition, a key feature of service comparing to manufacturing is that “for service, the product is the process” (Fitzsimmons and Fitzsimmons, 2001), which means that it is not possible to deliver a service without the active customer participation.

The service process matrix is used to classify service types upon the nature of the service. The matrix with two dimensions of the degree of labour intensity and the degree of interaction and customisation (Schmenner, 1986) yields a four-way service classification including service factory, mass service, service shop, and professional service. Customer interaction represents the degree to which the customer can intervene in the service process involving design, transformation, production and consumption, in which transformation process uses firm inputs and customer inputs (labour, property, and information) to produce the service outcome. However, customisation can occur interdependently of interaction, and labour intensity is an antecedent of customer inputs (Sampson and Froehle, 2006). Therefore, the dimensions of the service process matrix (Schmenner, 1986) needs modification, in which the classification characteristics include the degree of service customisation and the degree of customer participation as given in Figure 1.

The degree of service customisation is considered as the most important variable in classifying service systems (Chen and Hao, 2010). Ulkuniemi and Pekkarinen (2011) argued that customers may participate in service co-creation and increase the visibility of the service offering through modularity. Following Apte and Vepsäläinen (1993), customised services are typified by numerous configurable parameters, and require close customer relationship. Standardised services are characterised by limited configurable parameters, and a transaction-based customer relationship strategy. Bitner et al. (1997) argued that the extents of customer participation from low to high in service production define different customisation levels from standardised to customised services.

**Figure 1** Service process matrix (see online version for colours)

<table>
<thead>
<tr>
<th>Service Customisation</th>
<th>Customer Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service shop</th>
<th>Professional service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>Doctors/Lawyers</td>
</tr>
<tr>
<td>Auto repair shops</td>
<td>Accountants</td>
</tr>
<tr>
<td>Restaurants</td>
<td>Architects</td>
</tr>
<tr>
<td>Service factory</td>
<td>Mass service</td>
</tr>
<tr>
<td>Fast foods</td>
<td>Retail firms</td>
</tr>
<tr>
<td>Hotels/ MOTels</td>
<td>Wholesale firms</td>
</tr>
<tr>
<td>Airlines</td>
<td>Schools</td>
</tr>
</tbody>
</table>

Source: Maister and Lovelock (1982) and Schmenner (1986)
Table 2  Levels of customer participation

<table>
<thead>
<tr>
<th>Low: customer presence required during service delivery</th>
<th>Moderate: customer inputs required for service creation</th>
<th>High: customer co-creates the service product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products are standardised</td>
<td>Customer inputs customise a standardised service</td>
<td>Active customer participation guides the customised service</td>
</tr>
<tr>
<td>Service is provided regardless of any individual purchase</td>
<td>Provision of service requires customer purchase</td>
<td>Service cannot be created apart from the customer’s purchase and active participation</td>
</tr>
<tr>
<td>Payment may be the only required customer input</td>
<td>Customer inputs (information/materials) necessary for adequate outcome, but service firm provides the service</td>
<td>Customer inputs are mandatory and co-create the outcome</td>
</tr>
</tbody>
</table>

Source: Bitner et al. (1997)

The degree of customer participation is defined as the effort paid by customer when they are involved in the production process (Wang et al., 2007). According to Sampson and Froehle (2006), customer participation in a production process is classified into a service process with customer inputs (labour, property, and information) or a non-service process without customer inputs (service design, selection and consumption). In addition, Uzkurt (2010) explored the antecedents, components and outcomes of customer participation that provide insights in ensuring and facilitating customer participation in the service processes.

4 Design of service system

The literature on service system design emphasises the importance of conceptual models of strategic service alignment (Ponsignon et al., 2011). Heskett (1987) proposed a strategic service vision that consists of identifying target market, developing a service concept to address the target market, codifying an operating strategy to support the service concept, and designing a service delivery system to support the operating strategy. Recently, Roth and Menor (2003) synthesised an integrated model of service system design – service strategy triad that reconciles two distinct perspectives of marketing and operations.

4.1 Service strategy triad

The service strategy triad considers the strategic alignment of three components:

1. the target market
2. the service concept
3. the service delivery system design.

Each component in the service strategy triad as illustrated in Figure 2 influences the service encounters that are defined as the customer contact points at which the customers meet and interact with the service firm (Roth and Menor, 2003).
The target market defines ‘who are the customers’ that is essential for evaluating the relevance of the research insights and the efficacy of service standards and performance outcomes. The choice of target markets guides a wide range of input in SOM research and practice – from the parameter inputs to positioning the service products and the delivery systems against competitors (Pullman et al., 2001; Metters et al., 2003).

The service concept relates to the characteristics of service offered to the target market that plays a significant role in competitive services and market positioning. Sasser et al. (1978) first described the service concept as “the bundle of goods and services sold to customer and the relative importance of each component to the customer”. According to Heskett (1987), the service concept is a description of the service in terms of its features and elements as well as in terms of the benefits and value that it intends to provide to the customers. As mentioned earlier, a service can be described as an outcome, the what, and as a process, the how. Since customers purchase the service outcome and also participate in the process, the design of service system involves both the service outcome and the process of service delivery. The process of service delivery ensures that the expected service outcome is received by the customer (Goldstein et al., 2002). Thus, service firms pay attention to designing the system by which service concepts are produced and delivered to their customers.

The service delivery system design addressed the question of ‘how’ the service concept is delivered to target customers (Tax and Stuart, 1997). Collier and Meyer (2000) argued that the configuration of a service delivery system is defined by service classifications to meet customer requirements. Roth and Menor (2003) proposed architecture of service delivery systems that is organised around three major interrelated and dynamic components of service delivery systems:

1. strategic service design choices
2. service delivery system execution renewal and assessment
3. customer perceived value of the total service concept.
The service strategy triad is useful for emphasising the need for alignment between the service concept and the process of service delivery, but the triad provides little assistance in specifying the design characteristics which are necessary to realise the alignment. The service process matrix is helpful to classify different types of service based on alignment between service and process. It is useful in investigating the strategic changes in service operations, but the matrix does not define and specify how to approach service strategy.

4.2 Service positioning matrix

Many earlier researchers attempt to develop models and frameworks for service positioning strategy. The service process matrix (Schmenner, 1986) analyses the effects of the various positions that can be useful to investigate the strategic changes in service operations. However, two dimensions of the matrix are difficult to distinguish and interpret. The SPA model (Tinnilä and Vepsäläinen, 1995) and the service process/service package (SP/SP) matrix (Kellogg and Nie, 1995) investigated the most efficient positions on the diagonal of the matrix, while the need for control would be greater for positions above or below the diagonal. Thus, the strategic positioning matrix is developed with two modified dimensions: service customisation and customer participation as in Figure 3.

Figure 3 Strategic positioning matrix (see online version for colours)

![Service Positioning Matrix](image)

The lower left quadrant labelled ‘service factory’, contains firms with a low degree of customer participation and a low degree of service customisation. The low customer participation and standardised service allow service firm in this quadrant to operate similar to factories that can take advantage of economy of scale. The lower right quadrant is for a standardised service and high customer participation, this quadrant is labelled ‘mass service’. The upper left quadrant with a customised service and low customer participation is labelled ‘service shop’. Finally, the upper right quadrant contains firm with a high degree of customer participation and a high degree of service customisation, this quadrant is labelled ‘professional service’.

Service strategy is cost leadership for service factory based on low-cost inputs and efficiency. It diminishes the advantages of learning through repetition, non-divergence, and economy of scale. In contrast, firm adopts a differentiation strategy for professional service that strives to provide a unique service or a service in a different way from its
competitors. Service strategy for quadrants of mass service and service shop should be focused strategy that identifies customer groups with the similar customer inputs and expectations, and then design the service process around those inputs and expectations.

4.3 Service delivery strategy

Service delivery strategy involves both channel strategy and allocation policy. The overall objective of service delivery strategy is not only to identify opportunities to make a strategic tradeoff between customer utility and firm cost, but also to enhance customer efficiency and firm productivity. The challenges require service firms to face various choices in such tradeoffs.

In the traditional approaches, service delivery strategy is developed on the basis of either the firm approach or the customer approach. The customer approach requires service delivery strategy to maximise total utility based on customer behaviour. The firm approach based on firm behaviour develops service delivery strategy so as to minimise total cost. Trinh and Kachitvichyanukul (2013) compared the co-production approach with the traditional approaches through the co-producer model. The analytical result indicates that the co-production approach generalises and extends for both the firm approach and the customer approach. Moreover, there exists a tradeoff between customer efficiency and firm productivity in service delivery systems (Trinh et al., 2012). Figure 4 presents an analytical framework that conducts strategic tradeoffs between firm and customers for the design of service delivery systems.

In addition, Ponsignon et al. (2011) states that the design of the service delivery system should support the realisation of the service concept and different service concepts require different approaches to the design of service delivery systems. Zomerdijk and Vries (2007) emphasises that contingency variables, such as the service being delivered, have influence on the design of service delivery systems. Trinh and Kachitvichyanukul (2013) develops analytical models for service delivery strategy from strategic level to operational level that provides the important guidance for the design of service delivery systems. Figure 5 presents strategic options for service delivery design adapting to service concepts.

Figure 4 Analytical framework for service delivery strategy (see online version for colours)

![Analytical framework for service delivery strategy](image-url)

Source: Trinh and Kachitvichyanukul (2013)
As mentioned earlier, service factory provides standardised service with low customer participation that allow service firm to adopt a cost strategy that can take advantage of economy of scale and employ less expensive unskilled workers. Since service delivery system design adapts to service strategy, service delivery strategy requires minimising total cost and maximising efficiency change. In contrast, professional service with customised service and high customer participation allows service firm to adopt a differentiation strategy to maximise both total utility and productivity. Service factory and professional service are considered as extreme types of service classification, in which other service types also exist, like mass service and service shop. Mass service has low customised service in combination with high customer participation. Service shops provide various types of customised services with low customer participation similar to job shop type in manufacturing operations.

5 Practical implications

A common thread in SOM research and practice generally seeks to address a fundamental question: what theoretical and practical insights can be discovered that will enable firms to effectively deploy their operations in order to provide the right offerings to the right customers at the right times (Roth and Menor, 2003)? In answering this question, SOM needs a tool for classifying services and for identifying these service characteristics that point to the appropriate choice of process for creating the service. Collier and Meyer (2000) presented an empirical comparison of three service matrices (Silvestro et al., 1992; Kellogg and Nie, 1995; Collier and Meyer, 1998). Theory, definitions and axes associated with each of these studied matrices are tested and compared using a common set of data. The implications are that the development of a really good service positioning matrix remains in its infancy, and service operations concepts are more difficult to quantify than their manufacturing counterparts. To illustrate the ‘fuzzy nature’ of service operations, Verma (2000) studies management challenges among different types of service industries (service factory, mass service, service shop, and professional service). The empirical study provides interesting insights about SOM. The managerial implication
is that a better understanding of management issues related to various service industries helps to identify ways to address the important management issues.

In recent studies, Ponsignon et al. (2011) investigated the characteristics and contingencies of service delivery system design; a case study is designed to explore empirical data on four target markets, four service concepts, and on the design characteristics of the corresponding four service delivery systems. The practical implications emphasise the importance of considering the complexity of the service offering, the customer relationship strategy, and of taking a process-orientation to address service delivery system design. In addition, Trinh and Kachitvichyanukul (2013) developed an analytical framework that provides strategic options for the design of service delivery systems. Edvardsson et al. (2011) compared a service system design under goods-dominant logic and service-dominant logic. As a result, a service-dominant service system outperforms a goods-dominant service system in terms of both objective and subjective criteria.

In a world in which a significant number of customers obtain their service from multiple service delivery systems, the design and management of such a system requires understanding of how customers decide which service delivery systems to utilise and how these choices affect both the optimal design of service delivery systems (Xue et al., 2007). To address these challenges, service firms need to develop service delivery strategy that considers the impact of information system actions (Migdadi, 2012), the integration for supply chain redesign and value co-creation perspective (Dobrzykowski et al., 2011).

6 Conclusions

The design of service system is an important strategic issue and also one of the most interested topics in SOM. Building on the prior literature with the co-production approach, the paper develops the unified framework for the design of service systems. While the theoretical background on co-production provides general principles for service operations, the design of service system requires theoretical models to guide managerial decisions.

The co-production approach extends for the underlying approaches, such as customer contact approach (Chase, 1981; Chase and Tansik, 1983) and unified service theory (Sampson, 2001; Sampson and Froehle, 2006), and the proposed framework unifies the prior conceptual frameworks including models of strategic service alignment (Goldstein et al., 2002; Roth and Menor, 2003); service classification schemes (Kellogg and Nie, 1995; Tinnilä and Vepsäläinen, 1995; Collier and Meyer, 1998) and service design models (Edvardsson and Olsson, 1996; Johnston and Clark, 2005). The unified framework includes theoretical models such as service strategy triad, service positioning matrix and service delivery strategy. The service strategy triad provides an integrated model for service system design that emphasises on strategic service alignment of target market, service concept, and service delivery system design. The service process matrix is helpful for service classifications and service strategy. Meanwhile, the service positioning matrix is used to realise the alignment between service strategy and service delivery strategy.

Even the paper provides practical implications on the service system design, co-production theory is still far from completed that it requires various additional empirical
studies to test the reality of the co-production approach and to suggest its shortcomings to the framework for the design of service systems. Finally, the paper contributes general principles and theoretical models for the design of service systems.

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References


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