

A SYSTEMATIC FRAMEWORK OF VALUE CO-CREATION MODELLING IN SERVICE SYSTEMS

Yen-Hao Hsieh, Department of Information Management, Tamkang University, New Taipei City, Taiwan, R.O.C., yhhsiehs@mail.tku.edu.tw

Abstract

Service systems can be regarded as the arrangement of resources that are linked to other systems based on value propositions. Value co-creation in service systems is very important for enterprises to get competitive advantage and customer satisfaction. This research attempts to theoretically model value co-creation in service systems based on the concept of service-dominant logic and resource-based theory. This research aims to synthesize previous literature and build a theoretical model of value co-creation that can contribute to a concrete research foundation information management and service science research fields. Meanwhile, this research can provides important clues for enterprises to design value co-creation activities and service facilitation in accordance with customers' perspective as well.

Keywords: Value co-creation, Service system, Service-dominant logic, Modelling.

1 INTRODUCTION

Service has been the important economic activity for the enterprises and countries around the world. According to Vargo and Lusch (2006) and Maglio et al. (2009), service can be defined as the application of competences (e.g. knowledge and skills) for the benefit of another party. Enterprises have to offer different kind of high quality services to fulfill customers' diverse needs and requirements, especially in complex dynamic service environments. Customers with high satisfaction can enhance customer loyalty and the positive reputation for the enterprise. That is, enterprises have to pay lots of efforts in maintaining the long-term customer relationship to increase business profits and sustainability via providing appropriate services.

Although the service topic has been continuously emphasized by the academic researchers, in recent years, there still have been a lot of studies discussing and investigating the critical issues of service. In order to enhance the understanding and theoretical foundation of service research, IBM proposed "Service Science" for researchers and enterprises to explain all possible phenomena in service contexts. Service science is an interdisciplinary field that aims to study the service system and the co-creation of value in complex configurations of resources (Maglio et al. 2009). Furthermore, service-dominant (S-D) logic was proposed by Lush and Vargo (2004) and Lush and Vargo (2006) that provides broad service researchers with a concrete and fundamental notion to further study in the service field.

Accordingly, remarkable advances have been made in the service field by the theoretical notions of service science and service-dominant logic. The main characteristic between service science and service-dominant logic is to emphasize the importance of value co-creation in service contexts. According to Gummesson (2007), customers buy what is perceived to be of value for them rather than purchasing products or services. Value performs as a compass for customers, enabling them to deal with problems and fulfill needs. Value is an improvement for human beings in service contexts. GrÖnroos (2008) addressed that service providers are the value facilitators to create service activities that customers can involve in. Customers can take part in service activities to contribute their values to service

providers. Consequently, designing suitable service activities to enable customers to co-create value is an essential work for enterprises to increase their competency.

Recent studies have emphasized the importance and the necessary of co-creation of value between service providers and customers within service systems (Grönroos 2008; Payne et al. 2008; Andreu et al. 2010; Saarijvi et al. 2013). According to Spohrer et al. (2007) and Vargo et al. (2009), service systems can be regarded as the arrangement of resources (that is, people, organization, information, technology, service, time and so on) that are linked to other systems based on value propositions. In other words, service systems can be composed of the stakeholders of service delivery, the context of service delivery and the utilities for value co-creation. Moreover, the main purpose of service systems is to take advantage of existing resources to improve the present circumstance. Value can be directly created and delivered through service systems.

Since there are lots of components to form complete service systems, the complexity of service systems becomes extremely high. Especially for value co-creation in service systems, enterprises have to take the usage levels of existing resources into account to create collaborative service activities for customers. Customers also should understand what they really want and what role they would like to play first. The most importance is that enterprises have to clearly define value provisions of services relating to customers' needs. Hence, either enterprises or customers don't realize the actual purposes and have the necessary of knowledge and skills that can't articulate the co-creation of value (Andreu et al., 2010).

Furthermore, Edvardsson et al. (2006) stated that value in service systems can't be easily linked to specific services, goods or customers. Grönroos (2008) mentioned that it is difficult to evaluate the concept of value co-creation within service systems. How to systematically build a structure of co-creation of value for service systems is a very tough issue as well. Besides, customers have altered their roles from passive receiver of services to active co-creators of services and values within service systems (Saarijvi et al. 2013). Customer engagement in the co-creation of value is a complicated process that can be viewed from different aspects (Payne et al. 2008). Skaržauskaitė (2013) noted that managing and measuring value co-creation process is a critical topic that less research completely investigated.

According to above previous studies, several critical points of the co-creation of value in service systems that are very important and interesting needed to further study. For instance, what kinds of roles and resources can enterprises and customer have to hold? How do enterprises evaluate values within service systems? What kinds of service activities can be customers involved in? These critical points based on the pioneer studies can be a concrete and important basis for us to propose this research. It should be interesting and worthy of studying the research direction given past studies have encouraged further researchers to continuously focus on the research topic.

Although there have been a lot of studies investigating possible issues of value co-creation, to our knowledge, there is less research studying on how to systematically build a concrete structure of value co-creation in service systems. Most studies mainly provide conceptual ideas and frameworks without any empirical evidence to apply into practice (Skaržauskaitė 2013). Meanwhile, the issues of measuring and managing the co-creation of value in service systems should be completely noted.

2 LITERATURE REVIEW

2.1 Service-Dominant Logic

In traditional viewpoint, enterprises aim to sell high quality products to their customers in order for satisfying customer needs. Hence, enterprises pay more attention to focusing on the manufacturing process and the functions of products that can increase added-values embedded in products for customers. Reducing the manufacturing cost and reinforcing the producing performance are still the key

considerations for enterprises to take into account. That is, the role of customers is only regarded as the end users receiving and employing products without lots of interactions with enterprises. Either enterprises or customers who can get values and achieve their goals should be within the transaction process. Enterprises get profits by selling products to customers and customers can fulfill their needs and deal with their problems by buying and employing products. These statements and considerations can be presented as goods-dominant (G-D) logic (Vargo & Lusch 2004; Vargo & Lusch 2008).

On the contrary, Vargo and Lusch (2004) and Vargo and Lusch (2008) also proposed service-dominant logic to explain the present service context. Nowadays, customers can't be easily satisfied with goods and services without unique, innovative and quality features. In order to maintain the long-term customer relationship, enterprises try to explore potential opportunities. Service becomes an important economic activity that enables both enterprises and customers to get valuable merits (Grönroos 2008). Hence, enterprises attempt to adopt business transformation from the manufacture industry to the service industry.

According to Vargo and Lusch (2008), service is the foundational basis of exchange in service-dominant logic. Enterprises employ operand resources as the fundamental source to increase their competitive advantage in the market. Since the nature of service is intangible and perishable, both enterprises and customers can acquire values when customers are using services. Meanwhile, the role of enterprises is to provide value propositions with customers rather directly delivering values to customers. The role of customers is to co-create values with enterprises based on the proposed value propositions.

2.2 Value Co-creation

We have known that value co-creation is the critical feature in service systems based on the notion of service science and the concept of service-dominant logic. Value results from the beneficial applications of operand resources that are transmitted through operand resources or goods (Vargo & Lusch 2004). According to Holbrook (1987), value can be eventually derived with the participation of the beneficiary through use in the process of acquisition, usage and disposal. Maglio et al. (2008) mentioned that value simply in terms of an improvement in system well-being and we can measure value based on the evaluation of the adaptiveness and the fitness of the service system in service environments. Vargo and Lusch (2006) proposed that the co-creation of value is a desirable purpose as it can enable enterprises to focus on customers' viewpoints and to improve the front-end process of identifying customer needs and wants. Romero and Molina (2011) mentioned that value co-creation can be considered as a cooperative process involving service interactions between providers and customers. Skaržauskaitė (2013) defined co-creation as "a form of market or business strategy that emphasize the generation and ongoing realization of mutual firm-customer value." Grönroos (2008) analyzed that enterprises offer customers resources for their use. Customers can be regarded as creators of a value foundation through facilitation process. Ramaswamy (2011) stated that value co-creation is the process by which mutual value is expanded together.

Saarijvi et al. (2013) noted the diversity if the concept is based on different explanations of what constitutes the "value", the "co-", and the "creation" within it. The meaning of "value" is to not only distinguish what kind of value but also confirm the roles of value. The implication of "co-" is to understand what kind of resources can be used for creating value. "Creation" means that what kind of the mechanism can enable enterprises and customers to produce value. Furthermore, Grönroos (2008) addressed that enterprises and customers play different roles in the value co-creation process. An enterprise is a value facilitator to provide customers with a foundation for value creation in the form of existing resources (i.e., service, goods, information or others). A customer can be considered as a value creator during value-generating process where existing resources available to customers and skills held by them are added. Accordingly, Saarijvi et al. (2013) proposed an analytical framework by taking two roles into accounting for explaining value co-creation.

skills, or capabilities. The resources can lead to have competitive advantages and it has to be difficult to imitate them.

In the beginning of resource-based theory, enterprises have to clearly identify and classify their resources to analyze the strength and weakness by comparing with their competitors. To identify possible opportunities for better usage of their resources should be the first phase. Second, enterprises need to ask a question “what can we do more effectively than our rivals?” Hence, understanding all capabilities, the resources for capabilities and the complexity of each capability are necessary for enterprises. Then, enterprises should evaluate the rent-generating potential of resources and capabilities by analyzing the potential competitive advantage and the appropriability of returns. Finally, enterprises can select the best business strategy to face the possible challenges from rivals based on the suitable resources arrangement and competitive advantage.

Figure 2 shows the application of resource-based theory into value co-creation. Enterprises (providers) with sufficient resources (e.g. information technology, knowledge, employee and budge) can have high abilities to design appropriate service activities to attract customers to take part in. Meanwhile, customers clearly understand their roles and employ their own resources (such as knowledge, personal skill and past experience) to involve in service activities that not only to fulfill their basic needs but also co-create value with providers. Hence, the service system can achieve the highest benefit for providers and customers.

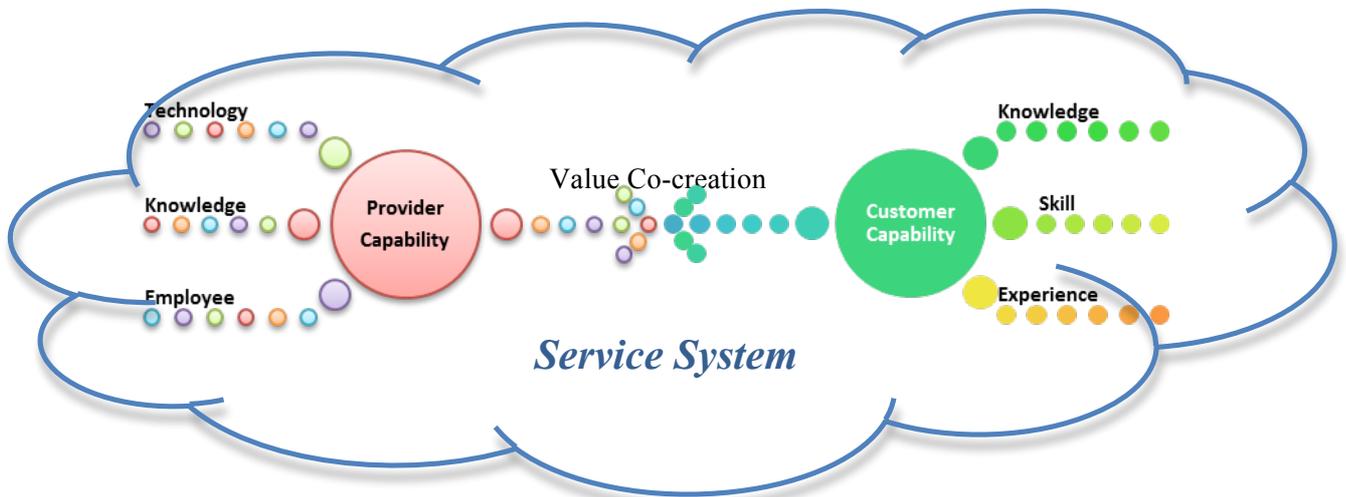


Figure 2. Applying resource-based theory into value co-creation

As aforementioned, value co-creation in service systems is a complex process that is composed of different kind of resources (e.g. service, activity, information, provider, customer, knowledge, skill, experience and so on) (Vargo et al. 2009). Again, Maglio et al. (2009) emphasized that the co-creation of value in service systems is the process for complex configurations of resources. Accordingly, resource-based theory is a proper theoretical foundation to explain the circumstance of value co-creation in service systems. Meanwhile, it is extremely useful to recognize the potential and existing resources to systematically model value co-creation of service systems based on resource-based theory.

3.3 Mathematical Modelling

According to the value co-creation framework and resource-based theory, we try to briefly model the possible situation of value co-creation in service systems. This research also refers to model of value creation (Ueda et al. 2008) to model value co-creation in service systems. Although several existing approaches (e.g. empirical surveys, in-depth interviews or focus group interviews) can also identify

the value variations in service systems through directly querying respondents, it is difficult to model the complete condition of service systems. The mathematical modelling can be a suitable way to dynamically define the situations of value variations in service systems.

Let each service, S_n ($n = 0, 1, 2, \dots, i$) is composed of several attributes which can serve customers with utilities. We can set utilities as $S_n = S_n(u_1, u_2, \dots, u_j)$, j means the numbers of utilities. That is, u_j ($j = 1, 2, 3, \dots, i$) is to present the level of utilities. The price of each service S_n can be given as follows:

$$P_n = S_n \Gamma = (u_1, u_2, \dots, u_j) \begin{pmatrix} \gamma_1 \\ \gamma_2 \\ \vdots \\ \gamma_j \end{pmatrix}$$

where $\Gamma (\gamma_1 \gamma_2 \dots \gamma_j)$ denotes the basic price of u_1, u_2, \dots, u_j .

Moreover, in order to generate services, providers have to consider their cost. Hence, the cost of each service can be presented as $C (c_1, c_2, c_3, \dots, c_j)$. The total service profit can be defined as:

$$\Pi = \sum_n (P_n - S_n C) \times N_c$$

where $C (c_1, c_2, c_3, \dots, c_j)$ denoted the unit cost of u_1, u_2, \dots, u_j . N_c is the number of customers who use S_n in service systems.

For each customer, O_n ($n = 1, 2, \dots, N$), could have their demand level, $D_n (d_{n1}, d_{n2}, \dots, d_{nj})$.

$$D_n = D_n (d_{n1}, d_{n2}, \dots, d_{nj})$$

After customers perceived services in service systems, customers can have their own reservation value $V_n (v_{n1}, v_{n2}, \dots, v_{nj})$ that can show how much they pay for one level of each utility of each service. RP_n is the reservation price, that is, the price O_n (certain customer) would like to pay for the service. The equation can be modeled as follows:

$$RP_n = D_n V_n = (d_{n1}, d_{n2}, \dots, d_{nj}) \begin{pmatrix} v_{n1} \\ v_{n2} \\ \vdots \\ v_{nj} \end{pmatrix}$$

Accordingly, customers O_n can choose whether to employ S_n or not. The total utility U_n in service systems can be completely represented:

$$U_n = RP_n - P_n$$

Consequently, it is useful for the research to model a complex situation (such as value co-creation in service systems) by adopting mathematical modelling approach. That can efficiently enable us to understand the present phenomena and analyze the influences within service systems. The most merit is to realize service activities and interactions of value co-creation in service systems by using mathematical modelling approach. The above modelling process is a simple situation without taking all possible variables into account. However, the modelling process is to represent the feasibility for this research to continuously execute and implement.

4 CONCLUSION

Value co-creation in service systems is very important for enterprises to get competitive advantage and customer satisfaction (Grönroos 2008; Vargo & Lusch 2008). When enterprises design proper service activities to attract customers to take part in, value of the service can become uttermost between enterprises and customers. Customers can co-create value through joining service activities as well. However, to our knowledge, there has been less research focusing on how to modelling value co-creation in

service systems and proposing a suitable approach to adopt the idea of value co-creation in practice. Hence, this research attempts to theoretically model value co-creation in service systems based on the concept of service-dominant logic and resource-based theory. The simulation results can be predictably considered as essential guidelines for enterprises to make correct decisions of creating suitable service activities and strategic policies in practice. This research aims to synthesize previous literatures and build a theoretical model of value co-creation that can contribute to a concrete research foundation information management and service science research fields. Researchers can have definite procedures to further study the critical issues of value co-creation in service systems.

References

- Andreu, L., Sánchez, I. and Mele, C. (2010), "Value co-creation among retailers and consumers: new insights into the furniture market," *Journal of Retailing and Consumer Services*, 17(4), 241-250.
- Edvardsson, B., Enquist, B. and Hay, M. (2006), "Values-based service brands: narratives from IKEA," *Managing Service Quality*, 16(3), 230-246.
- Grant, R.M. (1991), "The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation," *California Management Review*, 33(3), 114-135.
- Grönroos, C. (2008), "Service logic revisited: who creates value? And who cocreates?" *European Business Review*, 20(4), 298-314.
- Gummesson, E. (2007), "Exit Services Marketing – Enter Service Marketing," *The Journal of Customer Behaviour*, 6(2), 113-141.
- Holbrook, M.B. (1987), "What is consumer research?" *The Journal of Consumer Research*, 14(1), 128-132.
- Maglio, P.P., Vargo, S.L., Caswell, N. and Spohrer, J. (2009), "The service system is the basic abstraction of service science," *Information Systems and e-Business Management*, 7 (4), 395-406.
- Payne, A.F., Storbacka, K. and Frow, P. (2008), "Managing the co-creation of value," *Journal of the Academy of Marketing Science*, 36(1), 83-96.
- Ramaswamy, V. (2011), "It's about human experiences...and beyond, to co-creation," *Industrial Marketing Management*, 40, 195-196.
- Romero, D. and Molina, A. (2011), "Collaborative networked organizations and customer communities: value co-creation and co-innovation in the networking era," *Production Planning & Control: The Management of Operations*, 22(5-6), 447-472
- Skaržauskaitė, M. (2013), "measuring and managing value co-creation process: overview of existing theoretical models," *Socialinės Technologijos Social Technologies*, 3(1), 115-129.
- Spohrer, J., Maglio, P., Bailey, J. and Gruhl, D. (2007), "Steps Toward a Science of Service Systems," *Computer*, 40 (1), 71-77.
- Ueda, K., Takenaka, T. and Fujita, K. (2008), "Toward value co-creation in manufacturing and servicing," *CIRP Journal of Manufacturing Science and Technology*, 1(1), 53-58.
- Vargo, S.L., Caswell, N. and Spohrer, J. (2009), "The service system is the basic abstraction of service science", *Information System and E-Business Management*, 7(4), 395-406.
- Vargo, S.L. and Lusch, R.F. (2004), "Evolving to a New Dominant Logic for Marketing," *Journal of Marketing*, 68(1), 1-17.
- Vargo, S.L. and Lusch R.F. (2006), "Service-dominant logic: what it is, what it is not, what it might be," In: Lusch RF, Vargo SL (eds) *The service-dominant logic of marketing: dialog, debate, and directions*. M.E. Sharpe, Armonk, 43-56.
- Vargo, S.L. and Lusch, R.F. (2008), "Service-dominant logic: continuing the evolution," *Journal of the Academy of Marketing Science*, 36(1), 1-10.