Abstract: Servitization has come to be perceived as a major driving force of the modern economy. This called for service science to emerge as an inter-disciplinary academic arena. Despite the inter-disciplinary emphasis, there has been little interaction between the conceptual studies that have proposed and sophisticated core concepts like value co-creation and the formal studies that have dealt with the quality or the efficiency of services as the extrapolation of standard operations research. I attempt to fill in the gap, and model value co-creation formally via a non-cooperative game with subjective agents. Through the model, I show a number of concrete managerial strategies to foster value co-creation.

1 Introduction

Today, with the development of information technology, diversity of needs and other factors, servitization came to be conceived as a major profit generating strategy. The strategy is academically studied in service science that has emerged as an inter-disciplinary academic arena to discuss effective ways of creating value. Service science is still very young. Strategically, it has stayed at a prescience stage[1] for quite a while. One of the founding members of service science J. Spohrer has emphasized in many occasions that they do not want to repeat the history of operations research that has become too technical despite the grandeur scope of the field raised by the founders.

One of the symptoms of prescientific academic field is a chaos around technical terms. Value co-creation, a very core concept of service science[10, 2, 3, 4, 9, 11, 12, 8], is unfortunately a best example in service science today, the concrete examples of which I will present in the next section. One of the standard strategies for creating order to chaotic discussions in sciences today is to construct formal theories and models, the language of which is clear to the discussants. When the discussants disagree, they should know where exactly the disagreements are. Instead of continuing verbal discussions over and over again that often end up incommensurable, we may have a better idea about what we are talking about by talking on formal models. I am aware of little work so far that deal with this theme. In this research therefore, I aim at proposing an abstract game theoretical model on which I characterize value co-creation.

The rest of the paper is organized as follows. In the next section, I review how the technical term value co-creation is characterized in service science. In section 3, I review the related formal works of which I am aware. In section 4, I present a simple game theoretical model on which I characterize value co-creation and its relevance.

2 Review of the Technical Term – Value Co-Creation

In this section, I try to interpret the essential elements of value co-creation from several articles written by the authors that proposed the concept. The very first monumental paper in which the concept of value co-creation appears along with service-dominant logic (S-D logic) is Vargo and Lusch[10]. The writing style of Vargo and Lusch[10] is quite distinctive in resembling a bit to a text of a mathematical theory. They present what they call foundational premises (FPs) that resemble axioms in an axiomatic system of a formal theory. Unlike a formal theory, they do not claim independence of the axioms, and in fact at least a number of FPs only look theorems of other FPs. My reading of the paper thus tries to reformulate the important concepts involved in the FPs.

At the very first, the concept of value has to be clarified. There are two types of values according to A. Smith[7] – “value in use” and “value in exchange”. The focus of value in service science or S-D logic is the former. According to Lusch and Vargo[2], S-D logic, however, argues that value can only be created with and determined by the user in the ‘consumption’ process and through use or what is referred to as value-in-use. Thus, it occurs at the
intersection of the offerer and the customer over time: either in direct interaction or mediated by a good

Unlike the paradigm of “value added”, the value in use is determined by the final customer, and is inseparable of her cognitive filter. “Value is always uniquely and phenomenologically determined by the beneficiary” (FP10 of Vargo and Lusch[9]). They further comment on the FP that “Value is idiosyncratic, experiential, contextual, and meaning laden”.

Though they do not clearly state in the FPs, they seem to use the term service to describe the process that a service provider (enterprise) offers as value propositions (cf) FP7. They thus argue that “all economies are service economies” (modified FP5). Oddly however, folks like P. Maglio start with an introduction noting that the tertiary sector in the economy is increasing its share today. The articles and talks continue saying this is why service science is relevant today. In these talks, they naturally imply that the tertiary sector deals with services. The problem is that they are the very ones that advocate a technical use of the term service that is radically different from a legacy daily use. Lusch and Vargo[2] asks for the change of the use of service concept in this context as follows.

The reason this distinction is critical is that the notion of a tertiary and recent “services economy” blinds us to the fundamental nature of exchange and, thus, to opportunities in innovation. We argue that the S-D logic premise that all economies are service economies and the postulate that all businesses are service business liberates marketers to think of innovation in new and innovative ways (as Michel et al. in this issue encourage). That is, innovation is not defined by what firms produce as output but how firms can better serve. It is a distinction we make between competing with services vs. competing through service (Lusch et al. 2007).

To sum up, a formal model of value co-creation in service science revolves around the subjective utility of the customer.

3 Related Work

In fact, due to the interdisciplinary nature of service science societies, formal models in general are not at all new in service science. However, vast majority of the formal works deal with efficiency aspects, that are already dealt with in conventional operations research or management science.

Winkler and Dosoudil[6] is the only one semi-formal model of which I am aware that is directly related to value co-creation. Winkler and Dosoudil[6] formalizes value proposition by way of specifying a subset of clearly defined objective feasible alternatives. An example that is thoroughly explored throughout the paper is Car Rental service. Car Rental service is defined by a multi-attribute utility function of a customer, composed of attributes like location, price and so forth, and value proposition is characterized by specifying a subset of the attributes. In this research, I deal with a more subjective interpretation issue. In comparison to Winkler and Dosoudil[6], I am dealing with the specification of attributes by the service provider.

There is another indirectly related fundamental formal work that actually motivated this research, Sampson, S. and Froehle, C M., “Foundations and Implications of a Proposed Unified Services Theory”. It was in a workshop held in Tokyo Institute of Technology on service systems science in Feb, 2012 that Sampson has repeatedly criticized the concept and the use of the technical term value co-creation, and defended his own theory of unified services theory (UST) that “defines a service production process as one that relies on customer inputs” along with a core technical term of customer input. Customer input in UST resembles co-production, hence it is much narrower than co-creation. There are mainly two points in Sampson’s criticism. First, he argues that co-creation is a too tautological concept and is pragmatically useless, whereas customer input is a perfectly operational concept. Second, he claims that the expression “co” should apply only to those processes that are close in time and space, whereas co-creation is not used in that way. In addition to Sampson’s criticism’s being quite fundamental, it became clear through the debate that many participants of the workshop did not seem to have a clear distinction between co-creation and customer input. I have no intension whatsoever of claiming that the model I present is the model of service science. What I claim however is that it looks more fruitful to regard UST[3] as a theory rather than the theory of services. Or in other words, I claim that UST is not that unified. We do not need to rush into a single formal theory at this infant stage of service science. That does not however deny use of formal theories either. Multiple formal theories may be presented to deal with different aspects of services.

4 The Model

There are two players, provider (P) and customer (C).

As S-D logic suggests; the central factor of value in service science is value in use for the customer. Denote C’s subjective utility $u_C$. In general, $u_C$ can be described as

$$u_C = u_C(c_C, a_C, e_C, g_C)$$

where $c_C, a_C, e_C, g_C$ are the customer’s character, the customer’s action, the environment and the good quality. There is absolutely no co aspect in the model so far. As FP7 of Virgo and Lusch says, $P$ may, at best, assist
the creation of value in the subjective experience of the customer through value proposition, and this assistance process may be given the representation co-creation.

How can \( P \) assist \( C \) in enhancing the value? A number of options may be considered:

1) By improving the good quality \( q_C \). Recall that quality is also subjectively evaluated by the customer. For instance, the faster a car is, the better it apparently looks. However, it does not always make sense to make a car too fast. Compact cars that are used in cities do not require much of comfortable driving in express ways.

2) By enhancing the set of alternatives \( A_C \) of the customer. Maybe the best example is automobile and other transportation industries. They have greatly enhanced the feasible locations for travelers.

3) By adjusting more to the customer’s character \( c_C \). Here apparently, customization is the key factor.

4) By adjusting more to the customer’s environment \( e_C \). For instance, convenience stores in Japan flexibly adjust the amounts of goods to be sold at the stores according to the weather and other environmental factors.

The traditional goods-dominant logic focused on \( q_C \) independent of other factors. S-D logic asks the service provider to consider other factors such as \( c_C, a_C, e_C \) for the optimal design of \( q_C \).

If the service provider has something to contribute in \( q_C \), then in principle, FP6 of Virgo and Lusch is almost tautologically true by definition. Whether it is pragmatically useful to consider this fact is another matter. Sampson raised an illustrative example of coal mining industry. To the extent that it is the context of the coal user that determines the final value of coal for the customer, the value is co-created. For instance, value of coal in Japan is much less than it is in China where environmental regulation is much more loose. However, this issue may have little to do with coal mining companies – there may be little they can intervene. At least for a short term, what the coal mining companies can do is to improve the mining technologies. If in fact the controllable variables of the companies and the contextual variables of the customers are independent, then the company does not lose anything by sticking to the conventional goods-dominant logic.

A more long-term global look may change the landscape however. We all dislike polluted air, hence even coal producers may also have to think about how to create secondary products from coal to create potential customer needs that are not extant. This sort of thinking may open up a whole new petro-chemical industrial strategies.

5 Concluding Remarks

A formal model characterizing value co-creation hopefully diminishes unnecessary ambiguous usage of the concept.

A possible enhancement of the future work is to introduce the company’s utility with the explicit notion of money and profit.

References


