

Business-to-Business E-Commerce and Service Science: Building a Service Dominant Logic-Based Reference Model

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Abstract-The rise of the Internet and various information and communication technologies have opened up possibilities for businesses to grow and expand through the World Wide Web. Many businesses thus have started to engage in online business-to-business (B2B) transactions. However, though B2B e-marketplaces produced an early excitement from industry verticals, there have been many challenges which led to failure of some B2B systems. Various literature discuss many reasons for the lack of success. Reasons vary but it is contended that the goods dominant logic (GDL) hypothesized to be used in building those e-marketplaces contributed to this. Thus, it is proposed that a shift to the emerging service dominant logic (SDL) would solve the problems caused by the GDL, resulting to B2B e-marketplaces having greater success. Business-to-consumer (B2C) systems have made moves to implement SDL but little research has been done for the B2B sector. This paper attempts to fill that gap and presents an SDL-based reference model useful for B2B e-marketplaces.

Keywords-E-business, Business-to-Business E-commerce, Service Dominant Logic, Reference Models

I. INTRODUCTION

The Internet is one of this generation's most powerful tools. Numerous activities such as communication, information retrieval, and even business transactions can now be done in a quick and easy way online. Individuals, organizations, public and private sectors have now made moves to find their place in the World Wide Web. Businesses and marketplaces are no exceptions.

Dai and Kauffman [1] observed that the application of Internet technologies in conducting inter-firm business transactions has given rise to a sudden excitement to business-to-business (B2B) electronic commerce. However, despite the initial success, there have been many challenges which have led to the failure of some B2B systems.

Various literature showed that there were a lot of reasons for the lack of success of B2B systems [1][2][3]. Many of these reasons were tied to the value that businesses put on monetary gain, a characteristic of systems making use of the goods dominant logic (GDL). Hence, though the reasons enumerated by the authors [1][2][3] were diverse, it is contended that the factors contributed by the GDL approach used to develop those B2B e-marketplaces is one reason why the e-marketplaces have lost audiences.

As in a system using a GDL approach, most B2B systems have focused on creating units of output to accumulate wealth. The GDL is a logic centering on units of output as prototypic of exchange [4]. These outputs gain value as they are created by the manufacturers and when they are exchanged with items such as money or other goods [5]. Businesses often take on this logic when they venture into the e-marketplace. Doing so is however claimed to be disadvantageous as it undermines the role of buyers in a transaction.

The disadvantages of the GDL, however, are the advantages of SDL. SDL redefines value as something which is created upon use ("value in use") and not merely upon exchange for something ("value in exchange") [5]. This new definition of value requires focus on both buyers and sellers. SDL ensures that all parties play a vital role in co-creating value. Stockdale and Standing [2] claimed that transaction volumes are difficult to sustain when customers do not feel value in participating in an e-transaction. The shift to the SDL perspective of value however lifts the role of customers, thereby making transaction volumes easier to sustain. It is therefore hypothesized that switching to SDL would solve the problems caused by the GDL. When B2B systems are seen as service system entities and e-marketplaces are developed using the SDL approach, it is proposed that these e-marketplaces would be more successful than past or existing ones.

Malaysia is a country which currently makes use of e-marketplaces provided by the Internet. The nation has experienced growth in information and communication technology (ICT) in the last decade. Mukhtar et al. [6] said that this led to the increase of ICT usage of SMEs in recent years. The researchers asserted that the Malaysian wood-based industry has the potential to be turned into a digital industry by taking advantage of ICTs and the virtual environment. The government has also pinpointed the wood-based sector as the "cornerstone of the Malaysian manufacturing sector" and will pay an important role in the Third Industrial Master Plan (2006-2020) [7]. Creating an SDL-based e-marketplace for wood-based companies could therefore grant wood companies venturing into e-commerce more success. Not only that, it would grant the Malaysian manufacturing sector more success as well.

The authors took five Malaysian wood-based companies under study and used the results of the case

studies to validate an SDL-based reference model developed based on a review of literature.

This paper presents the EEE (Explore, Exploit, and Establish) Encounter Model as an SDL-based reference model proposed to be used as a base for developing e-marketplaces for other B2B systems as well.

II. RESEARCH PROBLEM AND SIGNIFICANCE

This research aims to solve the following problem: “How can an e-marketplace based on SDL be built and operated for a B2B e-marketplace?” Answering this problem by providing an SDL-based reference model is significant because SDL has thus far remained as foundational premises which have not been operationalized for B2B systems. Most frameworks attempting to foster value co-creation have been developed specifically for business-to-consumer (B2C) e-marketplaces but not for those of the B2B nature. This work fills in this gap with its initial attempt to provide a reference model useful to B2B e-marketplaces, specifically for one to be used by the Malaysian wood-based industry.

III. BUILDING AN SDL-BASED REFERENCE MODEL

A. SDL, Value Co-Creation, and Value Co-Creation Frameworks

SDL is an emerging and evolving approach to marketing that highlights a paradigm shift from being goods dominant to being service dominant [8]. This approach highlights processes, relationships, and the co-creation of value [9].

SDL is a set of logic bounded by a number of foundational premises. It was first introduced as a set of eight premises [10] and was later extended to ten premises [4]. The current premises are listed as the following [5]:

- FP1: Service is the fundamental basis of exchange.
- FP2: Indirect exchange masks the fundamental basis of exchange.
- FP3: Goods are a distribution mechanism for service provision.
- FP4: Operant resources are the fundamental source of competitive advantage.
- FP5: All economies are service economies.
- FP6: The customer is always a co-creator of value.
- FP7: The enterprise cannot deliver value, but can only offer value propositions.
- FP8: A service-centred view is inherently customer-oriented and relational.
- FP9: All social and economic actors are resource integrators.
- FP10: Value is always uniquely and phenomenologically determined by the beneficiary.

Summarized, these premises contain principles which can be used to address the problems caused by the GDL. Premises six to ten in particular addresses the GDL problem by redefining value as something that is created upon use, and not merely in exchange.

“Value in use” means that value is always co-created and value comes out of a service when the consumer makes use of it (not just when a consumer exchanges money or goods for it). Both consumers and producers play a vital role in creating value as it is seen in premises six and nine. Vargo et al. [5] explained in their paper how manufactures put value in a service by applying their skills in the production process and consumers by applying their knowledge and skills and using the service in the context of their lives. In addition to this, consumers may also give their own resources to provide service to the firms and through participating, complete the value co-creation process as premises seven, eight, and ten imply.

Value, as SDL sees it, can be the feeling of satisfaction that customers can get after being assisted in a self-service process (such as cooking a meal) or a full service process (such as eating in a restaurant) [11]. Value exists if the customer feels better after applying the service process. For B2B systems, value is generally seen as something which is “gained when weighted towards what has been given away or sacrificed” [12]. Value in B2B systems can stem out to three categories, these being communicational value, monetary value, and competence-related value.

Various authors have proposed various frameworks designed to foster value co-creation among businesses and consumers. Prahalad and Ramaswamy [13], Payne et al. [14], and Andreu et al. [15] are among these authors. Though their work focused on the B2C sector of the e-marketplace, parts of their models also apply to B2B e-marketplaces.

For example, Prahalad and Ramaswamy [13] proposed the DART model, stressing that the following are the building blocks of co-creation: dialogue, access, risk assessment, and transparency. The building blocks combined would enable companies to better engage customers as collaborators. Relating these building blocks to a B2B system, risk assessment and transparency would enable businesses to explore what other firms are offering to them at a greater degree. Access of certain tools and information may meanwhile refer to a greater exploitation of knowledge and resources. In addition, the dialogue between businesses may lead to establishment of certain relationships as shared learning and communication are involved.

Meanwhile, Payne et al. [14] proposed another framework designed to be process-based. The framework involved customer processes, supplier processes, and the encounter process that connected the two. Again, this framework was drawn from studies done on businesses involved in B2C transactions. It can however be noted that businesses involved in a B2B system also undergo encounter processes though not the same ones that B2C systems do. Still, a process-based framework could be ideal for B2B e-marketplaces.

Andreu et al [15] integrated the framework contributed by Payne et al. [14] with the work of Gronroos [11] and created a model involving the value co-creation process as well as actor roles. The model attempted to make sure that customers and suppliers match up at every resource and practices so that activities are managed properly and value is co-created. The model, however, focused once again on the B2C sector, but shows that the encounter process is indeed important in the value co-creation process.

Indeed, the frameworks for value co-creation for B2C systems have significant principles which are also applicable to those of the B2B nature. However, B2B systems have noteworthy differences. Payne et al. (2008), for example, pointed out that mapping customer processes is “more complex in such markets”. This being so, a framework specially designed for B2B systems is necessary.

An SDL-based framework for B2B e-marketplaces should allow the discovery and exploitation of interdependencies among companies. Forsstrom and Tornroos [16] asserted that, for value to be created in a buyer-seller relationship, a buyer and seller must first realize that they are interdependent with one another. Interdependencies, together with the creation and exploitation of these, maximize the value co-creation potential. Relationships without interdependencies maximized tend to be short-term and value co-creation tends to be minimal. Interdependencies are already inherent [16] and actors only need means to explore so that they would be aware that such interdependencies exist between them and another company.

In addition to allowing the discovery and exploitation of interdependencies, the SDL-based framework should also allow partnerships to be established. Partnerships are high-involvement, long-term relationships, which allow the maximization of the value co-creation potential. It is a relationship that has been through a process involving trust and commitment, leading to effective communication and flow of information, reduced problems and misunderstandings, chances for both companies to cope with uncertainties, enhanced efficiency of the combination of the efforts of the two companies, and a “division of labour” based on the abilities and resources of the companies involved in the partnership [16]. The potential for value co-creation is maximized when partnerships are established. Key terms in the establishment process are commitment, communication and trust. Partnerships however are not the end-point, as more interdependencies can be discovered at this phase and can be exploited continually.

Also, Ng et al. [17] identified attributes of value co-creation (AVCs) which could be integrated to an SDL-based reference model, to ensure that value is co-created in all stages of the encounter process. Seven generic AVCs were enumerated in the research: 1) complementary competencies; 2) process alignment; 3) behavioral alignment; 4) perceived control; 5) empowerment for customer and firm transformation; 6) behavioral transformation; and 7) congruence of expectations. These AVCs were discovered through qualitative data matched with previous literature. These AVCs would give a starting point towards changing the businesses’ internal organization to create more creative interfaces with the customer.

Ng et al. [17] also said that value co-creation happens at each level in a business process through a complex web of interactions. Buyers and sellers develop relationships at all levels through different processes and interactions. An alignment between buyer and seller should therefore occur so that interdependencies are seen and realized. Proper alignment leads to proper interdependencies which in turn

could lead to greater relationships like business partnerships.

From the stage of discovering interdependencies to the stage of establishing a partnership, an e-marketplace however has to go through stages where phases of market transactions occur. These are the information phase, agreement phase, and settlement phase [18]. The information phase is an exploration phase where businesses gather information such as the general business environment and technology of potential business market partners. The agreement phase begins when a service offer is received and is that phase where negotiations about the terms and conditions of the business transaction are made. The settlement phase is when the terms and conditions are finally accomplished. This model was created as a general reference for e-marketplaces, but does not yet have the concepts of SDL and value co-creation integrated into it.

Relating it however to value co-creation through the exploration and exploitation of interdependencies, the information phase mentioned is actually an exploration stage which could allow the discovery of interdependencies. The agreement and settlement phases allow the exploitation of interdependencies to occur, but it is necessary that partnerships are established once the settlement phase ends. However, it is possible that business transactions going through the phases mentioned would lead to partnerships, given that trust, communication, and commitment are involved.

In summary, certain principles and elements can be drawn from existing B2C value co-creation frameworks but have to be integrated with principles of interdependencies, partnerships, and AVCS. The same is true with the existing phase model of marketplace transactions. It contains principles useful for the creation of a new reference model, but has to have the mentioned SDL and value co-creation related principles incorporated into it. The integration would form an SDL-based reference model for B2B e-marketplaces.

B. Case Studies on Local Wood Companies

The review of literature presented in the previous section led to the development of an initial SDL-based reference model for B2B e-marketplaces. However, further studies were needed to validate this model. Thus, case studies using unstructured interviews were carried out using the participation of point people from five Malaysian wood-based companies with main offices located in Kajang, Rawang, and Kuala Lumpur. These interviews were conducted from October to November 2010. The elements of the reference model were first mapped to functionalities of a functional requirements definition model. This was done so that the model could be translated to a level that the participating wood company representatives could understand. The companies answered several questions designed for the researchers to see and understand how the companies operated and whether or not the model could indeed be relevant to them. The companies’ response to the interview questions led to a final functional requirements definition model, finally validating the proposed SDL-based reference model.

IV. THE EEE ENCOUNTER MODEL

This section discusses the EEE Encounter model developed from a review of SDL, value, and value co-creation frameworks and validated from case studies done on local wood companies. The model, presented in Figure 1, drew the concepts of value and interdependencies from Forsstrom and Tornroos' [16] work, creating an encounter process [14] that would bring about interdependencies between buyers and sellers. It incorporated concepts about the DART model [13] and attributes for value co-creation [17] into various stages in the encounter process. These stages are the explore, exploit, and establish stages and drew concepts from Schmid and Lindemann's [18] work.

The principles from the works mentioned formed the basic parts of the model but it is also important to note that the foundation of this model is laid upon the premises of SDL [5]. Co-creation of value is the focus of the encounter process. Also, it is the exploration, exploitation, and partnership establishment stages that facilitate the exchange of service, maximizing value co-creation among companies.

A. The "Explore" Process

Exploration allows buyers and sellers to see the service offered at both ends. Buyers and sellers must first be aware that they are interdependent with one another before they could move on to maximize the co-creation of value [16]. An e-marketplace should therefore have a means by which buyers and sellers can explore and discover that they are interdependent to one another.

As in the DART model [13], the concept of "risk" and "transparency" is also important in this part of the process. As both buyers and sellers see all the service offered at both ends, they also see the risks involved in the exchange, and the means to handle those risks. Three attributes of value co-creation (AVCs) [17] are integrated into the exploration process. These are: 1) complementary competencies; 2) process alignment; and 3) congruence of expectations. During the exploration stage, both buyers and sellers must be able to see how each one would provide each other the right judgment and expertise (complementary competencies). The process should also enable the processes of both companies to be aligned. This is possible as long as the companies offer a degree of transparency regarding their status and changes within the company. In addition, expectations must be brought out as early as the exploration process so that sellers would be able to meet buyers' expectations and vice versa.

B. The "Exploit" Process

Exploitation allows buyers and sellers to make the most of the knowledge and resources offered at both ends. Once interdependencies are recognized in the exploration phase, the exploitation of these interdependencies then brings the process of value co-creation to the next stage. This exploitation of interdependencies can act as the key to successful business relationships [16].

Another AVC is integrated in this process. In the exploitation process, buyers and sellers must have perceived control. This means that the e-marketplace should be developed in such a way that each party feels that they play an important role in the exploitation process and that they have control over the transaction.

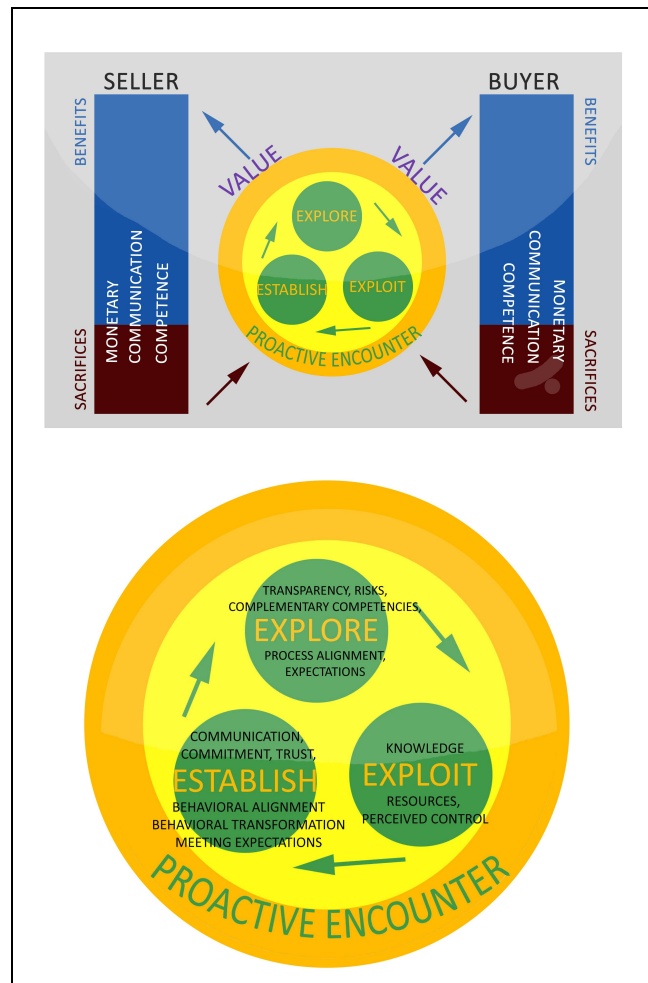


Figure 1. The EEE Encounter Model

C. The "Establish" Process

The establishment portion of the encounter process fosters the strengthening of relationships between buyers and sellers through communication, commitment, and trust. Strengthening of relationships is needed so that these would eventually lead to partnerships, thus further increasing the value co-creation potential. With an e-marketplace that allows buyers and sellers to communicate effectively, show communication, and establish trust, relationships can become more long term, ideally leading into a partnership.

However, if the relationship does not reach the level of partnership, the e-marketplace should at least be able to make the interdependencies more established. The possibility of creating new interdependencies can then be explored once again, thus the cycle of the EEE encounter process repeats, but this time with a higher level of commitment from both buyers and sellers.

Three more AVCs are integrated into this process: 1) behavioral alignment; 2) behavioral transformation; and 3) congruence of expectations. When relationships are established, it is the time that behaviors are often transformed and come into alignment. The right behaviors come into position to ensure that the value co-creation is effective and efficient. Congruence of expectations is also

integrated into this stage of the EEE Encounter process since it is in this stage that the expectations revealed in the “explore” process are met.

In all three EEE processes, it is necessary that the buyers and sellers maintain a pro-active encounter. This means that each party is responsible in initiating exploration, exploitation, and establishment. This concept is drawn from another AVC (empowerment for customer and firm transformation).

D. Value

Value is therefore co-created through this encounter process. Value in this model refers to the benefits gained or received from the sacrifices given away [16]. It groups these benefits into communicational value (involving reputation, reference value, market position, access and brand); monetary value (involving profit, volume and safeguard); and competence related value (involving technical competence, market intelligence, innovation and other kinds of learning). Value, being the benefits gained from the sacrifices given away, is therefore co-created through the e-marketplace’s encounter process, through exploration, exploitation, and establishment.

In this e-marketplace, buyers and sellers put their existing communicational, monetary, and competence related value at risk when they go through the e-marketplace’s encounter process. For example, a seller would be putting its reputation, its product volume, and its market intelligence at risk when it offers its service to its buyers. A buyer, when it engages in a transaction, also puts similar values at risk when it chooses to buy from a seller. When it buys from a seller, its monetary resources, competence to buy, and its communication value are on the line. Both know this but still enter the encounter process (represented by incoming arrows in Figure 1) knowing that benefits will come in exchange with these sacrifices. In the encounter process, the parties explore the service offered, exploit the interdependencies formed from the exploration process, and move towards establishing the interdependencies and the relationship further. The encounter process would allow the buyer to gain monetary value in the form of the volume received from the service. It also allows the buyer to gain communicational value from the establishment portion of the process, and competence related value as well. The encounter process also benefits the seller. It not only allows the company to receive monetary profits, but it also adds to the seller’s market position and technical competence among other benefits. These gains are all represented by the arrows coming out of the encounter process and into buyer and seller representation in the model. These arrows also represent the value being added to both buyers and sellers. Value, being the benefits gained from the sacrifices given away, is therefore co-created through the e-marketplace’s encounter process, through exploration, exploitation, and establishment.

V. CONCLUSION

Relating all these to the foundational premises of SDL, it is the exchange of service through the EEE Encounter process that allows buyers and sellers to co-create value. Service acts as the carrier of the communicational,

monetary, and competence values gained and given up (FP1, FP2, FP3, FP4, FP5). The entire process is relational and both buyers and sellers play an important role in the co-creation process (FP6, FP7, FP8, FP9, FP10). Thus, SDL shows its application to a B2B e-marketplace through the EEE Encounter Model.

The EEE Encounter Model is SDL-based and, though initially validated through case studies on Malaysian wood-based companies, could be suitable for other B2B e-marketplaces as well given that further studies be conducted.

This paper thus answered the question “How can an e-marketplace based on SDL be built and operated for a B2B e-marketplace?” by providing the said reference model. This model will serve as a base where functional requirements definition models and B2B e-marketplaces will be built.

As further proof of the EEE Encounter Model’s validity, a prototype for Malaysian wood-based companies was developed. The prototype was tested and evaluated afterwards by the five companies who took part in the initial case studies. The majority of the companies indicated interest in using an e-marketplace of that kind if it were to be fully operationalized in the future, seeing the value and innovation that it could bring to their companies. Further studies are recommended to fully evaluate how an e-marketplace based on this model fosters and encourages value co-creation among buyers and sellers.

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