

Summer 6-30-2018

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## Recommended Citation

Cui, Yi; Mou, Jian; Cohen, Jason; and Liu, Yanping, "Understanding IS Success Model and Valence Framework in Sellers' Acceptance of Cross-border E-commerce" (2018). *WHICEB 2018 Proceedings*. 39.

<http://aisel.aisnet.org/whiceb2018/39>

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# Understanding IS Success Model and Valence Framework in Sellers'

## Acceptance of Cross-border E-commerce

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**Abstract:** Cross-border e-commerce becomes more and more popular and general. The foci of researches in e-commerce have moved from domestic towards to global market. Yet, most of extant literatures are from buyer's perspective, whereas sellers are also important in the success of cross-border e-commerce. In this study, we are aiming to identify the elements of the success of cross-border e-commerce and the relationship with trust and intention to use from seller's perspective. To do so, we apply a mixed method to accomplish this research. We have identified the key factors which sellers are concerned about, and why they engage in cross-border e-commerce. In addition, we have developed new dimensions with associated items for system quality, service quality, perceived benefit and perceived cost in the context of cross-border e-commerce. The theoretical contributions and practical contributions have been discussed lastly.

Keywords: cross-border e-commerce, trust, ISS model, valence framework, mixed method

### 1. INTRODUCTION

Along with the development of e-commerce and economic globalization, cross-border e-commerce (CBEC) has successfully blossomed in the recent years. Buyers and sellers in online transactions are not limited to a domestic e-marketplace but in a broader and more general global market. According to Alibaba Group's report, the global B2C cross-border e-commerce transactions was \$230 billion in 2014, and this volume will increase to \$1 trillion by 2020 <sup>[1]</sup>. The development of cross-border e-commerce in European Union is relatively early. The main reasons of high utilization rate comparing to other non-EU countries is that EU countries have greater internet penetration, availability of credit cards, investment, availability of venture capital, education level, and spillover effects from neighboring countries <sup>[2]</sup>. Therefore, CBEC holds the greatest potential for the growth of e-commerce in the EU and globally <sup>[3]</sup>.

In addition, China has become another major market for CBEC with a compound annual growth rate of 30% each year since 2012, and the volume of its CBEC is approximate 20% of total volume of foreign trade <sup>[4]</sup>. It has been predicted that China will transcend the USA, UK, German, France, Japan and become the biggest cross-border market by 2020; moreover, Asia will be the CBEC center with 40% of total revenues by 2025 <sup>[5]</sup>.

The masses of rise in the number of e-marketplaces such as Amazon, eBay, and Alibaba have triggered the interests of both practitioners and scholars <sup>[6]</sup>. However, many cross-border e-marketplaces have failed in recent years due to the poor performance <sup>[7]</sup>, for example, Metao.com found in 2013 and failed in 2016. What mechanisms underline such failing issues have posed numerous questions for further investigation. Even though CBEC provides more choices with lower price and offers opportunities to both developing and developed countries to get benefits from global transactions, it still faces much more barriers than domestic e-commerce due to its special attributes <sup>[8]</sup>. These barriers include cultural difference, language translation, legal issues, geographic issues, localization, payments in global e-commerce trades, customs clearance problem, and logistic factors <sup>[9]</sup>. Beyond these common issues in CBEC, the quality of e-marketplace itself is another substantial in the

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success of global online trade. This also associates with the trust building process. The “trust” has been empirically studied as a crucial factor of intention to use through signaling theory in B2C <sup>[10]</sup> and B2B <sup>[11]</sup>. Therefore, understanding how trust influences the increasing CBEC adaption is crucial for uncovering the success of CBEC. Extant researches on CBEC are mainly focusing on the different determinants of successful transaction between buyers and sellers, such as reputation, word of mouth and so forth which lack the reasons in depth for the success of CBEC from seller's perspective. There are some studies focusing on e-marketplaces success, however, the measurement items are mainly from previous study. We agree that adapting previous measurement to study a new context is appropriate. However, given the complex nature of CBEC, we believe that there will be some new insights associating with system quality and service quality. In addition, there lacks a valid scale for both ISS model and valence framework from sellers' perspective, especially in the context of CBEC. To investigate potential components, we therefore conducted a mixed method study to explore their dimensions. Therefore, we wish to bridge this gap by finding the basic components of system quality, service quality, perceived benefits and perceived costs of conducting CBEC from the seller's perspective. As discussed above, China holds the greatest potential to become the largest cross-border e-marketplace in the world, so we apply ISS model and valence framework as our theoretical frameworks, and we collected data from a leading cross-border e-marketplace in China.

This paper is organized as follow: firstly, the theoretical backgrounds for our research have been introduced; secondly, the detail of our exploratory study and its findings are described; thirdly, the confirmatory study including our research model, hypothesis development, and method are displayed; finally, we conclude the contributions of this research and future works.

## **2. LITERATURE REVIEW AND THEORETICAL BACKGROUND**

### **2.1 Information System Success Model**

The original ISS model was revealed in 1992 through a systemic review of researches between 1981 to 1987 <sup>[12]</sup>. In this model, six dimensions are identified namely system quality, information quality, use, user satisfaction, individual impact, and organizational impact <sup>[13]</sup>. Afterwards, to meet the needs of researchers in information system and adapt the e-commerce environment, DeLone and McLean <sup>[14]</sup> have updated their ISS model with three modifications. Firstly, service quality as a new dimension was added along with system quality and information quality to make the whole model more comprehensive in evaluating the overall quality of e-commerce success. Secondly, system use was separated into intension to use and use which provide a non-mandatory system use option. Finally, they combined individual and organizational impacts into net benefits to make the model more parsimonious <sup>[15]</sup>. The final model could be described as that system quality, information quality, and service quality positively affect intention to use and user's satisfaction which will lead to actual usage, both user's satisfaction and actual usage can influence net benefits positively <sup>[14]</sup>. As suggested by Petter et al. <sup>[12]</sup>, the ISS model is applicable in various of contexts, this model has been successfully applied empirically in e-commerce including stickiness intention <sup>[15]</sup>, e-learning system <sup>[16]</sup>, repurchase intention <sup>[17]</sup> and cloud office <sup>[18]</sup>. This study focuses on the determinants of the success of e-marketplace from seller's perspective, therefore we adopt the updated ISS model as a part of our research model to evaluate the efficiency of e-marketplace.

### **2.2 Valence framework**

The valence framework is also applied to inform the development of our research model. The valence framework is derived from economics and psychology literature, and articulated through summarizing studies

on consumers' purchasing behavior<sup>[19]</sup>. This framework was proposed by Peter and Tarpey<sup>[20]</sup>, they considered that perceived risk/cost and perceived benefit were the two fundamental aspects of individual decision-making. The valence framework has been empirically proved to be a valid model for e-commerce environment. For instance, Kim et al.<sup>[19]</sup> introduced trust and satisfaction into the valence framework to study consumers' behavior in e-commerce; Mou et al.<sup>[21]</sup> covered trust beliefs and behavior intention with the valence framework in e-health services. Lu et al.<sup>[22]</sup> incorporated payment trust into their study about mobile payment. More recently, valence framework has been employed as a theoretical background to study CBEC consumer behavior<sup>[23]</sup>. The extended framework proposed by Kim et al.<sup>[19]</sup> is the most relevant model to our research. The ISS model is primarily dealing with the characteristics of information system itself to see the impact of usage and evaluate the system, whereas the valence framework is mainly focusing on the perception of user from both cost and benefit aspects to make a decision. Hence, we apply both models in our research, on one hand to avoid any unexpected negligence, on the other hand to make our result robust from both e-marketplace itself and seller aspects.

### 3. EXPLORATORY STUDY

#### 3.1 Research method

Following Venkatesh et al.<sup>[24]</sup>, we carried out a mixed-method study by combining both qualitative and quantitative approaches.

We first conducted interviews to identify the appropriate components of perceived benefits, perceived costs, system quality, and service quality. Because the IS success model and valence framework were two separate evaluation models, we conducted two separate sets of interviews with the first focused on the IS success model and the second focused on the valence framework. We were worried about the perfunctory responses due to the long interview duration time if we explored both frameworks at the same time.

The first set of interviews was focused on the valence framework. Although the dimensions of benefits and costs have been explored previously in e-commerce setting<sup>[22]</sup>, they are more often focused on a buyer's perspective. Given the complex transaction nature of CBEC, the potential benefits and costs may be different from the seller's perspective. Therefore, qualitative interviews were adopted to identify the potential benefits and costs of conducting CBEC business from the seller's perspective.

We conducted interviews with 14 randomly selected sellers who have been selling products through the cross-border e-marketplace for at least 3 years. They all use multiple cross-border e-marketplaces to conduct their business which means that they have enough knowledge and experience to answer our questions. Therefore, the results are considered to be reliable and valid. The interviews were conducted by the authors of this study one-on-one in an informal environment for approximate 10 minutes. The interviewees were asked to answer two open questions associated with our research topic, that were, what benefits you may perceive when you engage in CBEC and what cost or risk you may perceive when you engage in CBEC.

Another set of interviews was conducted with 14 other sellers to identify the key factors associated with IS success and seller's satisfaction. In particular, the predictors of behavior intention have been considered as system quality and service quality, and questions probed seller's complaints about the CBEC platform.

In the next step, the records and transcripts from interviews were open and axial coded following Corbin and Strauss<sup>[25]</sup>. The open coding process was conducted by one author, and the concepts extracted from the transcripts are identified. Afterward, these concepts were grouped into categories which reflected the commonalities to reduce the number of concepts. We then grouped these concepts into categories which reflected the commonalities to reduce the number of concepts.

### 3.2 Data analysis and results

As a result of the first set of interviews, 22 concepts and 9 categories were identified from open coding process. Similar concepts were grouped into the same category which were future classified according to their properties (Table 1). In our study, there are 5 categories for perceived benefit and 4 categories for perceived cost respectively.

**Table 1 Coding results for perceived benefit and perceived risk.**

Domain	Category	Concepts	Frequency	Percentage
Financial benefit	Profits	High profit	14	100%
	Sales volume	High order volume, High sales volume, High customer volume, Stable customers	12	86%
Product benefit	Brand	Proprietary brand development	4	29%
Strategic benefit	Trend	Long-term development, Development tendency	3	21%
Marketing benefit	Competition	More market, Less competition	4	21%
Financial cost	Monetary loss	Chargeback, Costly rent, Sales return	7	50%
Logistic cost	Logistic issue	Long duration of logistics, Costly logistics, High packet loss probability, Costly customs clearance	7	50%
Marketing cost	Market trends	Unpredictable foreign markets, Difficult inventory control	6	43%
Product cost	Patent dispute	Patent infringement	6	43%

The result of coding data from the second set of interviews is shown in Table 2. 5 system quality and 1 service quality categories were identified. The system quality factors related to ease of uploading and managing products on the site, while the service quality factors related to training and security, among other issues.

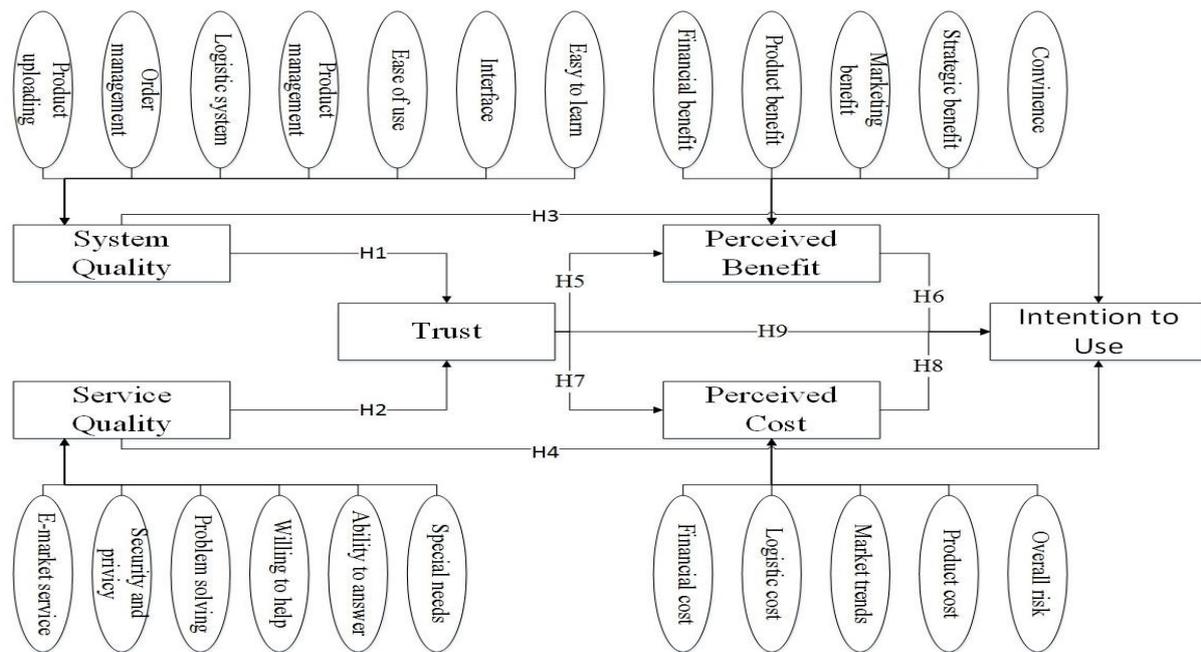
**Table 2 Summary of factors influencing satisfaction of usage.**

Dimension	Category	Comments
System quality	Products upload	Rigid uploading template, Screen stuck, Bulk uploading problem, Slow uploading, Adding draft saving function, Limited categories and specifications, Table editing deficiency
System quality	Product management	Auto push function for overdue product, Auto push function for safe stock
System quality	Order management	Adding remark function, Adding order sort function by dispute time, Adding fuzzy search function, Adding detail export and detail search function
System quality	Logistics	Limited logistics options
Service quality	E-marketplace service	Few train, Bad customer service
System quality	Others	Adding sub-account authority, Push function and control mechanism for malicious buyers.

## 4. CONFIRMATORY STUDY

### 4.1 Research model and hypothesis development

The research model of this study is based on the ISS model and the valance framework (Figure 1). According to the results of exploratory study, we utilized categories from table 1 and table 2 as the items of system quality, service quality, perceived benefit, and perceived cost to generate figure 1.



**Figure 1** The research model.

Trust in the context of online shopping refers to one's subjective belief that entity on the internet will fulfill its obligations<sup>[19]</sup>. Trust is generally built based on the information from small signals, symbols, or cues provided by the trusted party. Different from shopping in traditional stores, in online marketplace, people cannot physically interact with sellers, therefore, the trust is built by perceived website quality. According to Wang et al.'s study<sup>[15]</sup> on group-buying websites showed the significant relationships of system quality, and service quality with the users' trust beliefs and usage intention. Numerous e-commerce studies have indicated that system quality and service quality can positively influence users' perceived value, meanwhile, users' perceived value can facilitate the formation of users' trust. Therefore, we hypothesize that:

H1. System quality positively influences sellers' trust in e-marketplace.

H2. Service quality positively influences sellers' trust in e-marketplace.

Intention of usage in this study is regard to seller's willing of use a certain e-marketplace. The updated ISS model proposed by DeLone and McLean<sup>[14]</sup> showed that information-related, system-related, and service-related quality could positively influence the intention of use. This model and assertion were confirmed by many researches and also meta-analysis of ISS model. In our case of cross-border e-marketplace, we also believe that website quality (i.e. system quality and service quality) have positive effects on the intention of use a certain e-marketplace. We hypothesize that:

H3. System quality positively influences sellers' intention of using a certain CBEC platform.

H4. Service quality positively influences sellers' intention of using a certain CBEC platform.

Perceived benefit in this study refers to seller's subjective perceptions about the potential values of selling their goods in a certain e-marketplace. As claimed by Hadaya<sup>[26]</sup>, market efficiency was increased through market aggregation which provided opportunities for both buyers and sellers with lower transaction cost. Therefore, increase both buyer's and seller's intention to use is significant. Empirical evidence suggests that there is a positive relationship between trust and a variety of benefits. Kim et al.<sup>[19]</sup> suggested that customers could save their cost and comparison process or even increase their productivity when transacted with trusted sellers. Thus, all these benefits would be perceived by trusting customers, and these customers also believed that trusted sellers would fulfill their obligations. Moreover, as suggested by Kim et al.<sup>[27]</sup>, online customers were more likely to make a transaction in trusted website with their perception of benefit. Similarly, sellers in CBEC

believe that the trusted platform can fulfill its obligations for sellers and perceived more benefits compared to alternative platforms. They can increase their market reach, penetrate international markets and build their brands while lowering costs of transacting with international buyers on a trusted platform. Consequently, they are willing to do their business via trust platform because of more benefits they perceived. So, we hypothesize that:

H5. Seller's trust positively influences perceived benefit in CBEC platform.

H6. Perceived benefit positively influences sellers' intention of using a certain CBEC platform.

Perceived cost refers to sellers' subjective perceptions about the potential uncertainties or negative values of selling their goods in a certain e-marketplace. It has been investigated several potential uncertainties within e-commerce including financial costs, product costs, information costs<sup>[27]</sup>. Moreover, uncertainties have also been emphasized as a realistic issue in CBEC<sup>[23]</sup>. When e-commerce goes toward globalization, it must face much more barriers such as cultural difference, language translation, legal issues, geographic issues and financial issues<sup>[7]</sup>. Hence, sellers are more sensitive to perceived cost with e-marketplace on the solution of some issues, for example, credit card charge back, security, customs clearance and return cost. Because of these issues are not existed in a brick-and-mortar retail store like Wal-Mart where sellers can directly interact with buyers, so e-commerce seller's perception of cost or experience of using an e-marketplace depends more on seller's trust. Previous studies have suggested that trust reduce the sense of risk<sup>[19] [30]</sup>. For buyers, as trust increase, they may act more risk-taking behavior, and engage in a risky relationship with the vendor<sup>[19]</sup>. Similarly, if sellers trust a CBEC platform, they may perceive less cost and interact more with this platform rather than alternatives. Further, perceived cost has also been found that negatively influence a customer's online decision<sup>[28]</sup>. Unpredictable demand, hidden delivery costs, the potential for product return and chargeback, and buyer protection that disadvantages sellers will detract from sellers' trust and engagement on cross-border platforms. Thus, we hypothesize that:

H7. Seller's trust negatively influences perceived cost in CBEC platform.

H8. Perceived cost negatively influences sellers' intention of using a certain CBEC platform.

Sellers' trust built by whether their perception of net valance or website quality itself can enhance the intention behaviors. On one hand, trust can amplify potential benefits and increase the tolerance of perceived costs<sup>[27]</sup>, on the other hand, trust act as a mediator between website quality and intention behaviors<sup>[15]</sup>. Empirical evidence shows that trust significantly influence behavioral intention in e-commerce setting<sup>[29] [30]</sup>. Whether buyers or sellers, no matter where their trust are built (quality perceptions), they wish to transact with trusted parties to save their cost and increase their benefit. Therefore, we hypothesize that:

H9. Trust positively influences sellers' intention of using a certain CBEC platform.

#### 4.2 Operationalizing and testing the research model

We have identified all new items needed for the following study through qualitative research. All six constructs in our research model are measured with multiple items and in a 5-point Likert-scale ranging from one (strongly disagree) to five (strongly agree). Most of items of system quality, service quality, perceived benefit and perceived cost are from qualitative study of this research, whereas other items will be adapted from prior validated scales. As our questionnaire is originally in Chinese, we will conduct a back-translation procedure to ensure translation validity to English.

In the next step, we will collaborate with a Chinese CBEC platform and distribute our questionnaire to active sellers randomly via firm's e-mail system in three steps. There will be two rounds of data collection in our study and we will select all sellers as our targets who have not participated in the platform satisfaction survey within the previous three months period. In the first round, we are aiming to test our self-developed items from

the result of qualitative study by a pilot test. Afterwards, we will make some changes according to the result of pilot test to constitute our final version survey. We will administer the main survey over a 10 days period to allow for sufficient participation in the survey. The participation of sellers will be totally voluntary without any loss if they refuse to participate and their anonymity will be ensured. We will adopt structural equation modeling (SEM) by AMOS to test our hypothesis (structure model).

## 5. CONCLUSIONS

In the current study, we have proposed an integrated research model covering technical and perceptive aspects of CBEC from sellers' perspectives. Through the qualitative part of this research, we have identified the key factors which sellers are concerned about, and why they engage in CBEC. We have made a theoretical contribution by developing a comprehensive model for CBEC by combining two popular theories in e-commerce. Secondly, to operationalize the model, we have developed new dimensions with associated items for system quality, service quality, perceived benefit and perceived cost in the context of CBEC. Thirdly, we will test our hypothesis and research model using structural equation modeling. Practically, results of this study may help cross-border platforms better understand the needs and concerns from the seller's perspective who are generally under-represented in the literature but are crucial for the success of CBEC business.

## ACKNOWLEDGEMENT

This study supported by the Fundamental Research Funds for the Central Universities of No. JBX180604; and the Chinese Ministry of Education Humanities and Social Sciences project of No. 16YJC630038; and the National Natural Science Foundation of China of No. 71573199..

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