

FACTORS AFFECTING THE ADOPTION OF E-COMMERCE IN SRI LANKA: INTERNET USERS' PERSPECTIVE

K.G. Hashani Navarathna¹, and H.M.N. Dilum Bandara²

^{1,2}*Department of Computer Science & Engineering, University
of Moratuwa*

Emails: ¹hashani.17@cse.mrt.ac.lk,

²dilum.bandara@cse.mrt.ac.lk

Abstract

Despite being one of the earliest adopters of the Internet in the region, e-commerce adaptation in Sri Lanka appears to be relatively low. In this paper, we identify user-related barriers that prevent the wide-spread adoption of e-commerce in Sri Lanka. We adopted a mix-method methodology to identify Internet user-related adoption factors and to understand e-commerce merchants' views on those factors. First, a preliminary survey was carried out by interviewing stakeholders to identify barriers affecting e-commerce adoption. Next, users' perspective was captured using an online and paper-based survey. Survey results were analyzed using structural equation modeling. Finally, a set of interviews were conducted with e-commerce merchants to identify their views on those factors. Affordability, knowledge and awareness, and facilities expected from retailers were identified as the most significant factors contributing to the e-commerce adoption. Government and legal factors, consumer perception, and digital infrastructure are the least significant factors. Smoothing of the delivery process, convenient return policies, and enhancing government involvement to promote e-commerce were identified as the key recommendations to strengthen e-commerce adoption.

Keywords: E-commerce adoption, Internet users, Structural Equation Modeling

1. Introduction

Electronic commerce or e-commerce involves commercial or business transactions involving the transfer of money and information of buyers and sellers throughout the Internet (Schneider & Perry, 2000). Because e-commerce could improve efficiency and productivity in many sectors, it has gained significant attention across industries and states. While 34.7% of the Sri Lankans use either fixed broadband or mobile broadband (Telecommunications Regulatory Commission of Sri Lanka, 2018), as per the 2017 annual report of the Central Bank (Central Bank of Sri Lanka, 2017), overall sales of popular e-commerce sites in Sri Lanka are comparatively low. Also, peer discussions and customer ratings on e-commerce sites reveal that profit is only a part of the problem where the crux of the problem seems to be the infrequent use and reluctance to buy high-value items. As Sri Lanka is still transforming from traditional transaction methods into e-commerce, there is a significant opportunity to increase the level of adoption. Also, the current level of e-commerce maturity in Sri Lanka and the factors hindering the adoption are unclear. Therefore, to enhance the adoption and increase the maturity, it is imperative to identify the challenges from the Internet users' perspective.

In this paper, we focus on the challenges that prevent Internet users from adapting to e-commerce in Sri Lanka. We further analyze how merchants preserve those challenges. First, known hindrances for e-commerce adoption were identified with the aid of literature review and pre-survey. Next, a questionnaire was used to capture the users' perspective. Those key factors and their association were analyzed using the structural equation modeling technique. Based on the analysis, it was identified that affordability, knowledge and awareness, and facilities expected from retailers prevent Internet users from frequently using e-commerce in Sri Lanka. A set of recommendations is also derived that the business stakeholders could use to improve e-commerce adoption. These findings are beneficial to e-commerce service providers because both organizational and consumer perspectives go hand in hand in attracting, interacting, and retaining the customers.

2. Literature Review

While many aspects of e-commerce are analyzed in the literature, they mainly focus on the factors affecting the e-commerce adoption in Small and Medium-sized Enterprises (SMEs) (Choshin & Ghaffari, 2017; Kanyaru & Kyalo, 2015; Suriyapperuma et al., 2015). They have identified several firm-based characteristics which affect the e-commerce adoption in SMEs. Apart from the organization and its employees, they rarely focus on Internet users, which may experience different barriers while adopting e-commerce. Even though work such as Kabango and Asa (2015) identify factors affecting the online shopping behavior of consumers, they are difficult to generalize to Sri Lanka because consumer perspective can be influenced by social and economic factors, as well as evolve with time and the advancement of technology. Moreover, while measures such as national e-readiness (Bui et al., 2003) capture a country's capacity and preparedness to participate in a digitalized world, it does not solely represent e-commerce adoption. Hence, this research focuses on filling this research gap by identifying the consumer-related factors affecting the adoption of e-commerce.

3. Methodology

We adopted a research methodology consisting of four phases. In phase one, we identified a set of consumer-related technology adoption factors from literature. Then in phase two, we interviewed three CEOs and marketing managers of popular e-commerce retailers in Sri Lanka to identify further adoption factors that may be useful in the Sri Lankan context. In phase three, an online and paper-based questionnaire was distributed among the potential e-commerce consumers. Questions were derived from the factors identified in phase one and two, and the relevance of those factors was measured using a 5-point Likert scale. A subset of questions also focused on the demographic details of the respondents. Finally, in phase four, we validated the results and recommendations by interviewing three information officers of reputed e-commerce retailers.

Factors identified from the literature survey and pre-survey were not directly measurable. Therefore, a set of observable measures (Bentler & Bonnet, 1980) were generated to develop an association between these unobservable measures and e-commerce adoption.

Structural Equation Modeling (SEM) was used to assess the relationships between such constructs (Bentler & Ullman, 2003, Chapter 23). SEM allows the testing of multiple constructs simultaneously. Also, it calculates the strength of the association between constructs. We generated seven constructs based on the factors found in the literature review and pre-survey. Figure 1 shows the research framework created based on those seven constructs. Independent variables are represented on the left, while the dependent variable is represented on the right.

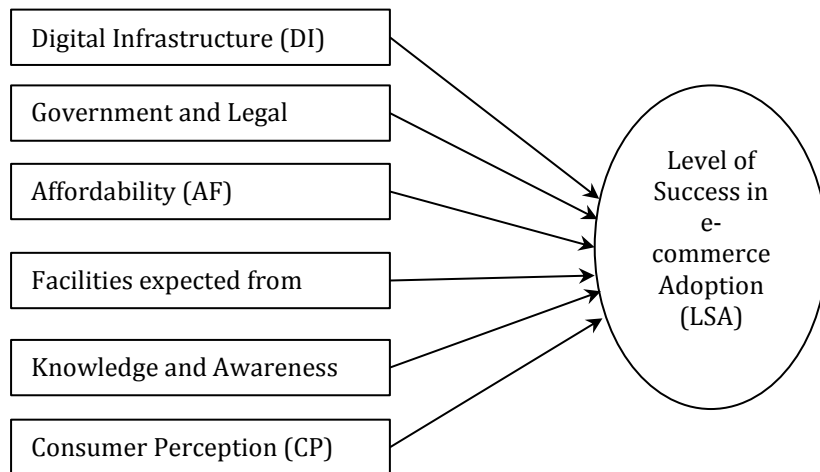


Figure SEQ Figure * ARABIC 1 - Conceptual Framework

Using the identified constructs/variables, we then derived the following set of hypotheses (let H_A be the alternative hypothesis while H_0 be the null hypothesis):

H10. There is no significant relationship between the maturity of digital infrastructure and the level of e-commerce adoption.

H1A. There is a significant positive relationship between the maturity of digital infrastructure and the level of e-commerce adoption.

H20. There is no significant relationship between the government and legal support and the level of e-commerce adoption.

H2A. There is a significant positive relationship between the government and legal support and the level of e-commerce adoption.

H30. There is no significant relationship between the affordability and level of e-commerce adoption.

H3A. There is a significant positive relationship between the affordability and the level of e-commerce adoption.

H40. There is no significant relationship between the facilities expected from retailers and the level of e-commerce adoption.

H4A. There is a significant positive relationship between the facilities expected from retailers and the level of e-commerce adoption.

H50. There is no significant relationship between knowledge and awareness and the level of e-commerce adoption.

H5A. There is a significant positive relationship between the knowledge and awareness and level of e-commerce adoption.

H60. There is no significant relationship between Consumer Perception and level of e-commerce adoption.

H6A. There is a significant positive relationship between Consumer Perception and level of e-commerce adoption.

According to the statistical data from the Telecommunications Regulatory Commission of Sri Lanka (2018), 34.7% of the total population has fixed broadband, narrowband, and mobile broadband subscriptions as of December 2018. Given this population, the sample size was determined to be 384 samples based on Cochran's formula (Bartlett et al., 2001) with a confidence interval of 0.05 and a confidence level of 95%. This technique is more suitable for large user populations (Bartlett et al., 2001). Convenience sampling (availability sampling) was used as the sampling method.

Data was collected using both survey and interview approach. A questionnaire was developed using measurable sub-factors to collect data. Due to the time constraints, Internet users who were readily accessible or available were targeted to collect the data. For the online data collection process, e-mail addresses were selected as per the convenience. Standard data cleaning processes were followed to filter the collected data. Post research interviews were carried out with information officers in popular organizations to validate the obtained results.

For better statistical analysis, the data set's validity and reliability must be above the agreed standards. Cronbach alpha coefficient, composite reliability, and average variance extracted were tested to determine the validity and reliability of the gathered data as per the thresholds listed in Table 1.

Table 1: Criteria for validity and reliability

Consideration	Constructs Value
Cronbach Alpha Coefficient	> 0.6
Composite Reliability	> 0.7
Average Variance Extracted	> 0.4
Significance Level (p value) (for 95% confident interval)	< 0.05
Discriminant Validity	<0.85

Source: Author developed

4. Analysis and Discussion

We collected a total of 414 (239 + 175) responses using an online and paper-based survey. While no missing values were recorded, 12 responses were excluded after applying standard data cleaning processes. The remaining 402 responses were used for the analysis.

According to the data validation process, the constructs we used to measure the e-commerce adoption were found to be accurate except the responses for Government and Legal Analysis (GLS) construct. Therefore, to maintain the reliability and validity of the data set, those data were removed before further analysis.

We used SMART PLS 3.0 Partial Least Square (PLS) based software for the data analysis based on SEM. Out of the six hypotheses tested using the SEM technique, three were found to be significant (having a *p*-value less than 0.05). Therefore, H3, H4, and H5 were proven and shown to be significantly affecting the level of successful e-commerce adoption.

The next step was to identify the strength of the association between construct and indicators. The PLS regression algorithm was used with a bootstrapping method to estimate the model developed using Smart PLS. The estimated model with bootstrapping, including corresponding *p* values in the inner model, and weight (strength) and *p* values for each

indicator in the outer model is shown in Figure 2. Constructs are indicated in Blue while Yellow squares represent the indicator variables. The inner model represents the relationship between a construct and level of adoption (i.e., AF → LSA). The outer model represents the relationship between a construct and indicators related to that. (i.e., AF → AF1 & AF → AF2).

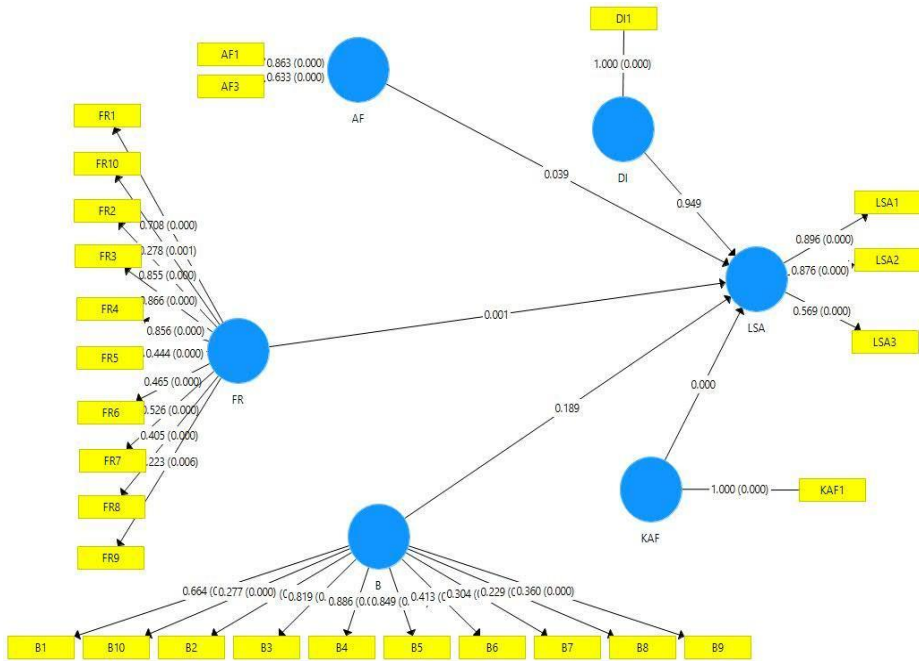


Figure SEQ Figure * ARABIC 2 - Estimated model with bootstrapping

Most online consumers are not highly concerned about the brand and quality of the advertised product or services. Their purchasing behavior is highly dependent on the price, benefits offered by retailers, and delivery options. Lack of knowledge about technology is a key technical barrier. Digital infrastructure was not much of a concern, as there are many means to access e-commerce in Sri Lanka. Behavior norms are not highly considered as relevant to e-commerce adoption.

Demographic characteristics such as gender, age, educational level, and employment sector of the survey participants were tested separately using the multi-group analysis to determine whether the behavior changes across demographics. Based on that, affordability was having a significant impact on the e-commerce adoption of the female

population compared to the male population. Bachelor's degree holders were more concerned on the retailers' facilities than the Master's degree holders. Among the employment sectors, the engineering sector is more concerned about affordability than Information Technology (IT) sector. Participants from all three sectors are keen on retailers' facilities, while the health sector had a higher effect with regards to facilities offered by retailers than the engineering and IT sectors.

Results were verified with three interviews carried out with domain experts. According to them, Internet users with higher incomes prefer to purchase online more. It gives them reliability and convenience. Generally, the younger generation is more apt with the technology; hence, they are more likely to consider the price rather than the quality of the product (Nanson, 2018). Moreover, most participants highlighted the means of delivery as a common obstacle regardless of their demographics. Sri Lankan e-commerce retailers were unable to have their delivery mechanisms and have to rely on external delivery services that are known to have the quality of service issues.

One of the key recommendations is that stakeholders should be looking into smoothing the product delivery process. This includes decreasing delivery time, having convenient delivery policies, and having multiple options or multiple centers to deliver island wide. The government could also take initiatives to motivate people to transfer to online transactions by reducing traditional transaction methods such as bill payments and bank transactions.

One limitation of our analysis is that the sample was biased towards a few social groups such as participants up to age 40 and employment sectors such as engineering and IT. Also, there is the possibility that the survey participants' perceptions may change based on the actual experiences with e-commerce retailers and time. Their beliefs (e.g., hidden charges, privacy concerns, compulsory registration, difficulty in reversing process if a mistake happens), fears, and factors which could limit e-commerce behavior need to be further researched.

5. Conclusion and Implications

Even though Internet usage is rapidly increasing, there is still a lag in wide-spread adoption of online purchasing/transactions than

traditional transaction methods. Therefore, the main objective of this study was to identify the factors affecting the e-commerce adoption in Sri Lanka from the Internet users' perspective. Potential influencing factors were identified through a literature survey and a preliminary study. Based on that, six hypotheses were formulated, and a questionnaire was developed as the research instrument. Afterwards, the questionnaire was distributed among potential Internet users in Sri Lanka. Responses were analyzed using structural equation modeling. Out of the six hypotheses, affordability, facilities expected from retailers, and knowledge and awareness were found to have significant impact on the adoption of e-commerce in Sri Lanka. Consumer behavior and digital infrastructure were not found to have a significant influence. Importance of price and income level appeared to be strong indicators in affordability construct while having home delivery and multiple pick up options, low delivery fees, delivery time, and delivery issues were the strongest indicators in facilities expected from retailers construct. Having knowledge and awareness on technology was the strongest indicator of knowledge and awareness construct.

One of the key conclusions of this research is, the population in the age range of 26-35 years with higher educational qualifications and relatively higher income are more likely to be the main e-commerce consumers among Internet users in Sri Lanka. Their online transactions and purchasing behavior is affected by price, income level, having home delivery and multiple pick-up options, low delivery fees, delivery time, delivery issues, and having knowledge and awareness on using the technology. Later on in the results verification interviews, improving the quality of the product delivery process, such as decreasing the delivery time, having convenient delivery policies and having multiple options or multiple centers to deliver island wide, government initiatives to make public awareness, and motivate the public to transfer into online transactions instead of traditional transaction methods are recommended by domain experts to overcome such challenges.

During the study process a couple of limitations were encountered. First, the sample population was biased on the gender, age category, profession, and urban demographics. Second, present non-Internet users were not included in this study. There is also a possibility that

survey participants' prior perceptions may change with their actual experience and may evolve with time. Furthermore, other scenarios such as factors from merchants and the government were not considered. To overcome this lag, a stratified random sampling technique, including other key sub groups is advisable to use in future researches. Since this study was biased to the urban population, a more representative sample might give a broader view to get more significant results. It is necessary to design a cross-sectional descriptive study in the community to explore potential customers who do not use e-commerce at present. Their beliefs, fears, and factors that limit e-commerce behavior must be researched. Also, questions to measure the percentage who are not involved with e-commerce would represent the status of e-commerce usage in Sri Lanka.

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