Impact of Instrumental and Social-Psychological Beliefs on Customer Satisfaction with Online Product Recommendations

Muhammad Ashraf, Noor Ismawati Jaafar and Ainin Sulaiman*

ABSTRACT

Manuscript type: Research Paper
Research aims: Online product recommendations (OPRs) provide various benefits for customers in evaluating and selecting a product. A relatively low OPRs usage rate indicates that customers are not satisfied with the performance of the OPRs. This study, therefore, aims to examine the role of instrumental beliefs (i.e. perceived ease of use and usefulness) and social-psychological belief (i.e. perceived confirmation) in predicting and explaining customer satisfaction with the OPRs.
Design/ Methodology/ Approach: A hypotheses-deductive approach is employed. The research model is tested by analysing the data of 626 existing users of OPRs which were collected via an online survey.
Research findings: Results suggest that instrumental and social-psychological beliefs are significant contributors to customer satisfaction with OPRs. Additionally, customer expectation-confirmation also positively influences perceived ease of use and OPRs usefulness.

* Ainin Sulaiman is a Professor at the Faculty of Business and Accountancy, University of Malaya, Lembah Pantai, 50603 Kuala Lumpur, Malaysia. Email: ainins@um.edu.my.
Muhammad Ashraf is a lecturer at the Department of Management Sciences, COMSATS Institute of Information Technology, Pakistan. He is currently pursuing his PhD at the Faculty of Business and Accountancy, University of Malaya, Lembah Pantai, 50603 Kuala Lumpur, Malaysia. Email: muhammadashraf@siswa.um.edu.my.
Noor Ismawati Jaafar is an Associate Professor at the Faculty of Business and Accountancy, University of Malaya, Lembah Pantai, 50603 Kuala Lumpur, Malaysia. Email: isma_jaafar@um.edu.my.

Theoretical contribution/ Originality: No prior study has examined the role of instrumental beliefs (i.e. perceived ease of use and usefulness) and social-psychological belief (i.e. perceived confirmation) in predicting customer satisfaction with the OPRs. This study has successfully tested the relationships which are likely to ensure a stable theory development.
Practitioner/ Policy implications: Since majority of the respondents were from western countries, the findings would be useful to e-retailers in Asia who are targeting or intending to penetrate the global market, in particular, Amazon customers. Practitioners should adopt a twofold strategy: (a) to inform new customers about the potential benefits of OPRs in terms of its ease of use and usefulness; and (b) to educate old customers on how to use OPRs effectively so as to maximise expectation-confirmation and satisfaction.
Research limitations/ Implications: This study employs a cross-sectional design rather than a longitudinal design. However, given that the objective of this study is to examine the impact of instrumental and social-psychological beliefs on customer satisfaction, a cross-sectional design is deemed more suitable. The outcome of this study suggests that cultural differences need to be considered when e-retailers are thinking of making such implications on Asian online customers as majority of the respondents in the current study were from non-Asian countries.

Keywords: Ease of Use, Expectation-Confirmation, Online Product Recommendations, Satisfaction, Usefulness
JEL Classification: M3

1. Introduction

Unlike conventional retail commerce, online customers are usually uncertain as to whether products meet their needs or whether product performance is up to their expectations (Weathers, Sharma, & Wood, 2007). Customers' inability to touch or experience the products before actual purchase might hinder their online buying decisions (Benlian, Titah, & Hess, 2012; Hong & Pavlou, 2010; Park & Lee, 2009a). Additionally, the immensity of product choices, the complexity and massive amount of information available online can also challenge customers' limited information processing capabilities (Sheng, Li, & Zolfagharian, 2014). Consequently, identifying a product that fits their need is not an easy task (Xiao & Benbasat, 2007). Further, there is also customers' dilemma of wanting to have more information on the one

hand, and being overloaded with too much information, on the other hand (Sheng et al., 2014). To help customers deal with such a dilemma, e-retailers (e.g., Amazon) are increasingly equipping their e-commerce sites with product recommender systems.

These product recommender systems provide product recommendations to customers as a means of assisting them in searching for, comparing, and evaluating products (Puzakova, Rocereto, & Kwak, 2013; Sheng et al., 2014). These online product recommendations (hereafter, it is called "OPRs") convince prospective customers about the quality of those recommended products, thereby resulting in higher customer spending and loyalty (eMarketer, 2012). The OPRs are generated based on content-based or collaborative-based technique which either analyses customers' profiles or track their past buying behaviours (Benlian et al., 2012; Xiao & Benbasat, 2007). These OPRs can influence customers' beliefs, attitude, and behavioural response in their buying decision process (Benlian et al., 2012; Huang, Tan, Ke, & Wei, 2013; Xiao & Benbasat, 2007; Xu, Benbasat, & Cenfetelli, 2014).

In this study, the OPRs refer to the online system generated recommendations which also incorporate previous customers' recommendations of products in terms of ratings and reviews. These ratings and reviews are integrated into the OPRs, mainly for the purpose of providing more related information to prospective customers or for the purpose of enhancing the effectiveness of the OPRs (Benlian et al., 2012; Kumar & Benbasat, 2006; Lin, 2014). In one study, Baum and Spann (2014) investigated the impact of the interplay between system recommendations and product reviews on customers' intention to follow the OPRs. They demonstrated that by incorporating product reviews into recommendations, e-retailers could increase the effectiveness of the OPRs which, in turn, has a positive impact on customers' purchase decisions. Several other studies (e.g., Häubl & Murray, 2006; Benlian et al., 2012; Xu et al., 2014) have also reported that the OPRs helped customers to reduce their cognitive efforts, increase product evaluation, and so, enhance decision quality. However, the actualisation of these advantages depends on whether customers embrace and fully utilise the OPRs and if so, to what extent.

In contrast to the significance of the OPRs, it is noted that the current percentage of sales, based on the OPRs usage, indicate that a large proportion of online customers are still not using the OPRs for their buying decisions. For example, various e-commerce specialists (e.g., Chu, 2013; Doman, 2011) and industrial reports (Mckinsey, 2013)

highlight that Amazon generates only 30 per cent of sales from the OPRs. This indicates a relatively low OPRs usage rate. This occurrence implies that customers are not satisfied with the performance of the OPRs. The general perception is that the e-retailers provide the OPRs due to their vested interest of increasing sales rather than for customers' interest (Cheong & Morrison, 2008). Consequently, this perception hampers customers' intentions to rely on the OPRs for their purchase decision. Nevertheless, no matter how useful the OPRs are, a critical issue still exist, that is, whether customers are satisfied with the OPRs or not and whether they would continue to use the OPRs (Sheng et al., 2014). This is an important issue which appears to have been neglected in existing OPRs research (Sheng et al., 2014). Moreover, content analysis of previous and current literature reveals that OPRs adoption studies (Benlian et al., 2012; Lin, 2014; Sheng et al., 2014; Sheng & Zolfagharian, 2014; Xu et al., 2014) have been fairly recent and new, hence, less attention has been given into examining customer satisfaction with OPRs.

Past studies (e.g., Griffiths, Johnson, & Hartley, 2007; Sharabati, 2014) have established that satisfaction is a valid non-financial measure of system performance and usage commitment. Satisfaction is also a consistent significant determinant of users' intention to continue a system and the long-term success effect of new technologies (Premkumar & Bhattacherjee, 2008; Thong, Hong, & Tam, 2006; Lee, 2010). Satisfaction plays a critical role in an evaluating system's success in voluntary contexts (Hou, 2012) as is the case with the OPRs. An effective OPR, but recognised by customers as ineffective, is in fact an unsatisfactory OPR. Due to OPRs lack of popularity among online customers, e-retailer's main concern became that of increasing customer satisfaction with the OPRs, especially if the usage is voluntary and is related to e-retailer's economic performance.

Recent studies (e.g., Hsu, Chou, & Min, 2014; Oghuma, Libaque-Saenz, Wong, & Chang, 2015) find that instrumental beliefs (perceived ease of use and usefulness) and social-psychological belief (perceived confirmation) are related to users' satisfaction with a technology. Based on this, it is implied that customers would most likely continue to use the OPRs for their future purchases. This is only if they are satisfied with the result of their perceived confirmation with regards to the ease of use and usefulness of the OPRs. Otherwise, customer dissatisfaction may lead to customer avoidance behaviour.

In that regard, the objective of this study is to examine the role of instrumental beliefs (i.e. perceived ease of use and perceived usefulness)

and social-psychological belief (i.e. perceived confirmation) in predicting and explaining customer satisfaction with the OPRs. A research model consisting of instrumental and social-psychological beliefs influencing end-users satisfaction is developed. To test the research model, data were collected from 626 Amazon customers who have been using the OPRs for their purchase decision. The data were analysed using SPSS and SmartPLS software. Results show that instrumental and social-psychological beliefs significantly influence customer satisfaction with the OPRs.

The remainder of this paper is organised as follows. Section 2 reviews the extant literature on the OPRs and factors influencing customer satisfaction with the OPRs. Section 3 discusses the research model and hypotheses development. Section 4 describes the research methodology and the statistical results. Section 5 discusses the findings and Section 6 concludes by providing the research implications.

2. Literature Review

2.1. Online Product Recommendations (OPRs)

Online product recommendations (OPRs) facilitate customers in evaluating and in deciding on which product to purchase (Xiao & Benbasat, 2007). The OPRs are generated by recommender system which is embedded within e-commerce sites. The recommender system is an Internet-based software which accomplishes a set of operations through two filtering techniques (Benlian et al., 2012; Xu et al., 2014; Xiao & Benbasat, 2007): content-based filtering and collaborative-based filtering. Content-based filtering refers to a technique which drives recommendations for a particular customer based on his/her explicit preferences of product attributes or past buying behaviour (Benlian et al., 2012; Xiao & Benbasat, 2007). Collaborative-based filtering technique resembles the word of mouth recommendation and it tracks the behaviour of like-minded customers to generate recommendations for a particular customer (Benlian et al., 2012; Xiao & Benbasat, 2007). These recommendations are based on the statistical analysis of patterns drawn from the data of product ratings which were explicitly given by other customers or drawn from data which track the customer's shopping behaviour (Montaner, López, & De La Rosa, 2003).

Usually, these system generated recommendations contain a brief description of a product and the provision of its key attributes (e.g., price,

screen size, hard drive size, RAM, processor of a laptop). Additionally, previous customers' opinions regarding the product attributes are also incorporated into the recommendation as a means of providing more related information for effective buying decisions (Benlian et al., 2012; Lin, 2014). These customers' opinions usually consist of product ratings and subjective evaluations of product attributes (Mudambi & Schuff, 2010). Product rating refers to the overall assessment of the product quality based on five star ratings. Subjective evaluation consists of product reviews by the past customers based on their post-consumption experiences. The reviews provide explanations of different product features based on their actual functionality (Benlian et al., 2012; Mudambi & Schuff, 2010). The most helpful reviews are usually displayed on the top of product reviews list shown just below the pictorial presentation of products (Benlian et al., 2012; Lin, 2014).

As mentioned earlier, OPRs contain both objective and subjective information of the product attributes. This information can help customers to effectively compare and evaluate the alternatives in making their buying decisions. Therefore, OPRs are gaining popularity among online customers due to the benefits derived such as a reduced information overload and an improved decision quality (Park & Lee, 2009b). Because of this, at least 43 per cent of e-retailers are currently providing OPRs (Gogoi, 2007). For further discussion on how customers' beliefs of OPRs evaluation influence their attitude and behavioural response in buying decision process, the expectation-confirmation model is presented below.

2.2. Expectation-Confirmation Model of IS Continuance

The expectation-confirmation model (ECM) of information system (IS) continuance proposed by Bhattacherjee (2001) is based on the congruence between users' IS continuance decisions and customers' re-purchase decisions. The expectation-confirmation is attained when the product performs as much as is expected i.e. it is positively confirmed when the product/IS performs better than is expected; and it is negatively confirmed when the product/IS performs worse than is expected. The ECM posits that a user's satisfaction with the IS use is dependent on two variables: (a) user's post-adoption expectations (e.g., perceived ease of use and perceived usefulness); and (b) the extent of user's confirmation of expectations. Users keep updating their expectations towards using the IS as they gain more experience. After assimilation

of these experiences, users' expectations toward the IS usage could differ from the initial expectations, before usage. The ECM provides an adequate explanation of the IS acceptance-discontinuance anomaly by explaining the causality relationship of disconfirmation-dissatisfaction. Users' expectations provide the baseline for the confirmation which subsequently determines their level of satisfaction.

A considerable number of past studies conducted in different technological contexts [e.g., broadband Internet usage (Lurudusamy & Ramayah 2016); SMEs website usage (Ramayah, Ling, Taghizadeh, & Rahman, 2016); mobile-library application usage (Zhao, Deng, & Zhou, 2015); electronic medical record usage (Ayanso, Herath, & O'Brien, 2015); online social networks usage (Basak & Calisir, 2015; Sun, Liu, Peng, Dong, & Barnes, 2014); e-Government usage (Santhanamery & Ramayah, 2014); computer based assessment usage (Terzis, Moridis, & Economides, 2013); and also Grammar modelling usage (Recker, 2010)] have applied and extended the ECM to investigate post-adoption phenomena of IS use. In the case of Ayanso et al. (2015), for example, the ECM was applied for the purpose of predicting user satisfaction with electronic medical records. They find that perceived usefulness, perceived risk and perceived confirmation are signficant predictors of user satisfaction. Similarly, Recker (2010) finds that the perceived ease of use and grammar familiarity as additional constructs of the ECM which significantly influence end-user satisfaction with the grammar modelling usage. Based on the discussion, it can be said that these studies have established the robustness of the ECM in predicting user satisfaction. However, there is no known study which employed ECM in predicting customer satisfaction with OPRs. The subsection below discusses the ECM factors with reference to the study of OPRs.

2.2.1. Customer Satisfaction

Satisfaction is conceptually, a transient, experience-specific affect, which is a key determinant of behavioural continuance intention (Zhao et al., 2015). For example, online brokerage users attribute their service dissatisfaction to brokers' inability to meet their expectations about maintaining server uptime, executing timely orders, and providing reasonable margin rates. Likewise, customer satisfaction with the OPRs diminishes if the OPRs do not perform as they expected (Benlian et al., 2012; Xiao & Benbasat, 2007). In an online environment, satisfaction has been shown to be a driving force in making online purchases

(Yoon, 2002) or in continuing to use a particular decision aid system (Xiao & Benbasat, 2007). Several studies (e.g., Tsai & Chuang, 2011; Chen & Tseng, 2011) have identified the different factors which could determine satisfaction. Tsai and Chuang (2011), for example, conducted an experimental study and find that information quality and cognitive effort significantly influence customer satisfaction with the product recommender system. Similarly, Chen and Tseng (2011) find that customers' satisfaction is influenced by information usefulness and the extent to which customers use information prior to their purchase decisions. A number of past studies looking at OPRs (e.g., Xiao & Benbasat, 2007; Wang & Benbasat, 2009; Xu et al., 2014) report that customers' satisfaction with the OPRs is a determining factor of their usage commitment and success rate of the OPRs .

2.2.2. Instrumental Beliefs: Perceived Ease of Use and Perceived Usefulness

In general, perceived ease of use and perceived usefulness have been employed as instrumental beliefs by several past studies (e.g., Ayanso et al., 2015; Hong, Kim, & Lee, 2008; Lee, 2010; Thong et al., 2006; Recker, 2010; Sun et al., 2014) for predicting user satisfaction. Ayanso et al. (2015) for instance, find that instrumental belief (i.e. perceived usefulness) signficantly influences user satisfaction with the usage of electronic medical records. Similarly, Recker (2010) and Thong et al. (2006) find that perceived ease of use and perceived usefulness have a positive impact on user satisfaction. In the study of OPRs, Benlian et al. (2012) employed perceived ease of use and perceived usefulness for evaluating customers' instrumental beliefs of the OPRs. They find that system recommendations and consumer reviews usage have differential effects on customers' instrumental beliefs. They also find that perceived usefulness significantly mediates the impact of the OPRs usage on customers' intention to reuse OPRs for future purchases. Since Benlian et al. (2012) have not examined the causal relationships between instrumental beliefs and customer satisfaction, this study aims to fill the theoretical gap by emprically analysing the causal relationship between the two factors. The significance of the instrumental beliefs in understanding the OPRs adoption phenomena is thus presented in the following paragraphs.

Perceived Ease of OPRs Use refers to the extent to which a customer perceives that the OPR is easy to use in evaluating the product (Benlian

et al., 2012). Huang et al. (2013) argue that a person considers a piece of information diagnostically if it is easy to comprehend and this can lead to an effective decision making process. Similarly, Häubl and Murray (2006) note that the way information is displayed can also influence the decision making process, affecting the ease of carrying out the information processing. Customers usually prefer the ease of information processing. They also tend to use information that is facilitated by a given display format which is effective in reducing task difficulty (Häubl & Murray, 2006). The OPRs have various characteristics such as product list, 3D product presentation, attribute trade-off, product comparison matrix, and product rating, all of which facilitate customers in evaluating the product quality. For example, a comparison matrix of recommended product assists customers to evaluate the various product attributes across alternatives. The ease of using the OPRs helps customers to free cognitive resources for making quality decisions. Conversely, if OPRs contain only textual information of product attributes and do not contain any pictorial presentations, then it would be boring and difficult for customers to read and understand the full textual contents of the recommendation (Benlian et al., 2012). In addition, empirical researches in educational psychology have also reported that the cognitive effort required for reading full-text sentences and passages is higher when compared to screening pictures and small chunks of key product information (Huang et al., 2013). In the case of full text based recommendations, customers have to first go through the unstructured text of varying formats, length, and style before they can get relevant product information (Benlian et al., 2012). This type of OPRs, therefore, is perceived to be less easy to use for product evaluation (Benlian et al., 2012).

Perceived Usefulness of OPRs refers to the degree to which a customer believes that using an OPR would enhance his/her performance of product evaluation (Benlian et al., 2012). OPRs are considered as being useful for online customers to evaluate and choose products from a massive set of alternative products which are available on the e-commerce websites (Benlian et al., 2012). The OPRs support a two-stage decision process which enhances customers' ability to effectively evaluate products (Benlian et al., 2012; Kumar & Benbasat, 2006). In the first stage, the set of alternative products is minimised to a certain level while in the second stage, this set of products is further evaluated in detail. The OPRs thus enable customers to cope with the overwhelming

information by providing relevant information for product evaluation. However, OPRs often provide persuasive and a rich source of product related information which could all be perceived as useful for evaluating and understanding the performance of various product attribute (Benlian et al., 2012; Komiak & Benbasat, 2006). OPRs provide task relevant cues to improve customers' utilitarian value and this can result in a greater perceived usefulness (Parboteeah, Valacich, & Wells, 2009). OPRs users can immediately see and evaluate the product's key attributes (e.g., key features, short description) and their values (e.g., price). By scanning the contents of OPRs, customers can infer on what the most important product attributes are and the different values of each attribute. Thus, these information will be perceived by customers as being more useful (Benlian et al., 2012).

2.2.3.Social-Psychological Belief: Perceived Confirmation

Social-psychological belief refers to the factor that leads an individual to behave in a given way while in the presence of others. It looks at the conditions under which certain feelings and behaviour/actions occur (Robinson, Shaver, & Wrightsman, 2013; Myers, 2015). Perceived confirmation is an important factor representing the social-psychological belief. It has been employed in various past IS studies (e.g., Bhattacherjee, 2001; Zhao et al., 2015). Perceived confirmation refers to customers' perception of the congruence between expectations of the OPRs use and its actual performance. Past OPRs studies (e.g., Komiak & Benbasat, 2006; Wang & Benbasat, 2004; Xiao & Benbasat, 2007) have highlighted the importance of considering and managing customer expectations in the designing of OPRs. Cheung, Luo, Sia, and Chen (2007) conducted an empirical research to see how people evaluated the OPRs. They find that customers' confirmation of prior beliefs significantly influence the perceived credibility of the OPRs. They further report that customers can detect the level of confirmation between the recommendations they receive and their initial perception of the products evaluated. When customers find consistency in the OPRs, based on their prior knowledge, they will have more confidence in relying on the OPRs for subsequent purchase decisions (Cheung et al., 2007). If the OPRs do not conform with the prior perception of the customers, they will probably refuse to accept the recommendation, thereby discounting its validity (Cheung et al., 2007). In that regard, it is possible that customers may stop using the OPRs due to disconfirmation of their expectations. Customers'

perceived confirmation suggests that they have obtained expected benefits from the OPRs usage and this may lead to a positive impact on their satisfaction with the OPRs. This relationship was originally explained in the expectation-confirmation theory noted in past studies (e.g., Lin, Wu, & Tsai, 2005; Oghuma et al., 2015; Brown, Venkatesh, & Goyal, 2012) where satisfaction is separately influenced by customer expectation and confirmation after actual usage. Positive confirmation elevates users' satisfaction and negative confirmation reduces their satisfaction.

3. Research Model and Hypotheses Development

Past studies have highlighted that satisfaction is a key determinant of the IS continuance intention (e.g., Lee, 2010; Thong et al., 2006; Tsai & Chuang, 2011). Satisfaction also plays a critical role in the success of the evaluating system in voluntary contexts (Hou, 2012) as is noted in the case of OPRs usage. These studies argue that satisfaction is crucial in explaining the acceptance-discontinuance anomaly phenomenon which often occurs in the context of IS adoption. If customers are dissatisfied or if their enthusiasm diminishes after the initial IS usage, they will also decrease their subsequent IS use. Alternatively, they may discontinue using the IS. In the context of OPRs, a number of conceptual (Xiao & Benbasat, 2007) and experimental studies (Hostler, Yoon, & Guimaraes, 2005; Wang & Benbasat, 2009; Xu et al., 2014) have mentioned that customers would most likely continue to use the OPRs if they are satisfied with the OPRs. Xiao and Benbasat (2007) conducted a conceptual study based on the synthesis of past literature in the context of product recommender system. Their study identifies a number of research gaps in the literature. They report that instrumental beliefs (i.e. perceived ease of use and perceived usefulness) and social-psychological belief (i.e. perceived confirmation) of OPRs evaluation could influence customer satisfaction.

In another study, Zhang (2007) proposes that various dimensions of the constructs could be related to the concept of motivational affordance. Zhang (2007) states that different motivational sources should be considered while designing any information system. It is noted that most individuals would like to use and continue to use a particular information system in order to fulfil their respective social, emotional, or psychological needs. In order to meet that suggestion, this study will thus incorporate instrumental beliefs (i.e. perceived ease of use and

perceived usefulness) and social-psychological belief (i.e. perceived confirmation) as constructs in the current research model so as to examine and explain how such beliefs can be used to predict customer satisfaction with OPRs. In support of the ECM of the IS continuance theory, it is argued that customers may have either positive or negative expectations with regards to the ease of using OPRs and its usefulness prior to acceptance of the system. While using the OPRs, customer expectations are either confirmed or disconfirmed. Low expectations are easy to confirm and may be updated to higher levels as a result of positive experience with OPRs. In contrast, high expectations are difficult to confirm and may be adjusted to lower levels. This new or updated expectations (higher or lower) may lead to customer satisfaction or dissatisfaction with the OPRs. It is assumed that customers' modified instrumental beliefs (i.e. perceived ease of use and perceived usefulness) and social-psychological belief (i.e. perceived confirmation) towards the use of the OPRs over time, can subsequently, influence their satisfaction with using the OPRs. Therefore, the proposed research model and hypotheses are as shown in Figure 1.

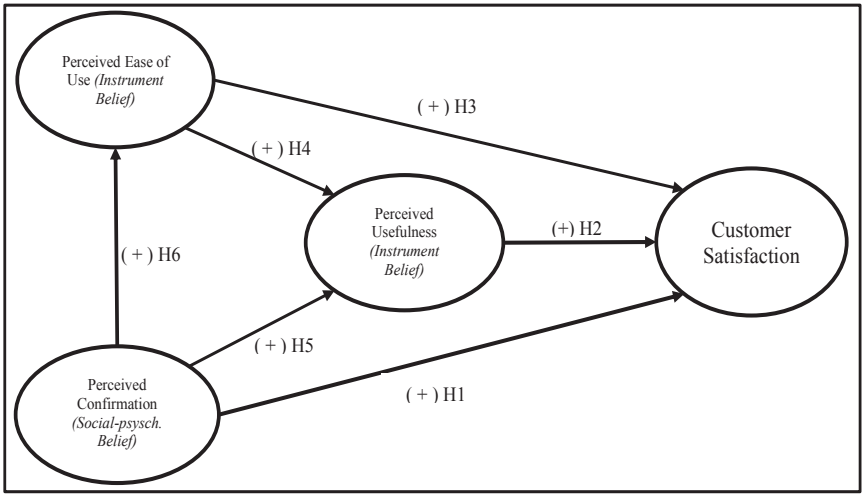

Figure 1: Research Model

Although past studies looking at OPRs (Komiak & Benbasat, 2006; Wang & Benbasat, 2004; Xiao & Benbasat, 2007) have highlighted the

importance of considering and managing customer expectations in the designing of OPRs, no empirical study has directly investigated the effects of perceived confirmation on customer satisfaction with the OPRs. Past studies (e.g., Komiak, Wang, & Benbasat, 2005; Wang & Benbasat, 2004) have highlighted that customers may stop using the OPRs if the recommender system does not fulfil their expectations of making better buying decision. To illustrate, Komiak et al. (2005) and Wang and Benbasat (2004) find that customers often get disappointed with the OPRs due to their expectation-disconfirmation towards broadening their horizon of product knowledge and effective buying decisions. Expectations provide a baseline level against perceived confirmation which is assessed by IS users in order to determine their level of satisfaction. Several past IS studies (e.g., Brown et al., 2012; Ayanso et al., 2015; Luqman, Razak, Ismail, & Alwi, 2016) find that perceived confirmation is positively related to user satisfaction. For example, Luqman et al. (2016) conducted a study on mobile e-commerce activities in Malaysia. They find that perceived confirmation is a significant and positive predictor of satisfaction. In some studies (Ahmad, Omar, & Ramayah, 2010; Luqman et al., 2016), perceived confirmation indicates the recognition of the expected benefits of the use of OPRs, and satisfaction is a higher affective state that is reflected as satisfied, indifferent, or dissatisfied, resulting from a cognitive appraisal of expectation-confirmation. This implies that higher (lower) confirmation causes higher (lower) satisfaction. In this regard, it is posited that customer's confirmation of expectations leads to a positive impact of satisfaction with the OPRs. For this purpose, the following hypothesis is formulated.

H_1 : Perceived confirmation is positively related to customer satisfaction with the OPRs.

Perceived usefulness is a key factor in predicting end-user satisfaction. This has been highly validated as it has also shown a consistent predictability for different information technology (IT) enabled services in post-adoption studies (Ahmad et al., 2010; Chen, Chen, & Chen, 2009; Luqman et al., 2016). To illustrate, Devaraj, Fan, and Kohli (2002) investigated customer satisfaction in the e-commerce context. They find that perceived usefulness has a significant positive impact on customer satisfaction. In another study, Zhao et al. (2015) find that perceived usefulness of mobile library application influences user satisfaction.

Likewise, Luqman et al. (2016) find that perceived usefulness is a significant secondary predictor of customer satisfaction with mobile e-commerce usage. Since online customers cannot touch or experience the product before actual buying, they strive to enhance their decision effectiveness by using OPRs (Xiao & Benbasat, 2007). An OPR with a rich and persuasive source of product related information will enable customers to evaluate alternative products before making a purchase decision (Benlian et al., 2012). Therefore, it is expected that perceived usefulness of the OPRs would have a positive impact on customer satisfaction with OPRs usage. Hence, in order to test this relationship, the following hypothesis is formulated:

H_2 : Perceived OPRs usefulness is positively related to customer satisfaction with the OPRs.

Bhattacherjee (2001, p.256) excluded perceived ease of use from the ECM based on the argument that "perceived ease of use has an inconsistent effect on attitude in the initial stages, which seems to further subside and become non-significant in later stages". However, subsequent studies (e.g., Lee, 2010; Luqman et al., 2016; Thong et al., 2006) conducted in different contexts, find that perceived ease of use is an important post-adoption expectation for predicting user satisfaction. For example, Thong et al. (2006) find that perceived ease of use significantly influences user satisfaction with mobile internet service. Similarly, Huang et al. (2013) report that perceived ease of OPRs comprehension impacts customer's decision making process. Luqman et al. (2016) find that perceived ease of use has a significant impact on satisfaction and an insignificant impact on continuance intention. Therefore, due to the inconclusive results in prior literature, it is worth examining the influence of perceived ease of use on customer satisfaction in the context of OPRs usage. Accordingly, the following hypothesis is formulated:

H_3 : Perceived ease of OPRs use is positively related to customer satisfaction with OPRs.

Several technology adoption model (TAM) based studies (e.g., Hess, McNab, & Basoglu, 2014; Huang, Huang, Huang, & Lin, 2012) find that perceived ease of use positively influences perceived usefulness. In the context of post-adoption, Thong et al. (2006) extended the ECM

by incorporating perceived ease of use into their study. They find that perceived ease of use significantly effects perceived usefulness of mobile Internet services. Similarly, a few other studies (e.g., Recker, 2010; Terzis et al., 2013) also report a significant relationship between perceived ease of use and perceived usefulness. It is thus expected that the more easy the OPRs is perceived to be, the more benefits customers see in using the OPRs (Benbasat & Wang, 2005; Benlian et al., 2012). Conversely, if customers do not perceive the OPRs as easy to use, they are less likely to rely on the OPRs and see the benefits of using them. Therefore, the hypothesis formulated is as follow:

H_4: Perceived ease of OPRs use is positively related to perceived usefulness of OPRs.

In spite of customers having an initial low perception of OPRs usefulness due to the uncertainty of what to expect from OPRs usage, customers may still want to use OPRs with the intention of forming a more concrete perception. In this regard, low perception of OPRs usefulness is easily confirmed or, it may be adjusted to a higher level, as a result of the confirmation experience, if customers realise that their initial perception of OPRs usefulness had been unrealistically low. This conclusion can be supported with the cognitive dissonance theory which says that customers may experience cognitive dissonance or psychological tension if pre-usage usefulness perception is disconfirmed during the actual use. Consequently, rational customers would try to remedy their dissonance. This is accomplished by updating their usefulness perception to become more consistent with reality. The perceived confirmation tends to elevate customers' perception of OPRs usefulness, and perceived disconfirmation will lower their perception. Moreover, past studies conducted in various contexts [e.g., mobile-library applications (Zhao et al., 2015), e-learning (Lee, 2010), mobile commerce usage (Luqman et al., 2016), and online shopping (Ahmad et al., 2010)] have reported that perceived confirmation significantly predicts perceived usefulness of target technology. Therefore, it is expected that customers' perceived confirmation may lead to their perceived usefulness of the OPRs. The hypothesis formulated is thus as follow:

H_5: Perceived confirmation is positively related to perceived OPRs usefulness.

Thong et al. (2006) applied a similar reasoning of relationship between perceived confirmation and perceived usefulness in extending the impact of perceived confirmation on perceived ease of use of mobile Internet services. They find that perceived confirmation signficantly predicts perceived ease of use. Subsequently various other studies (i.e. Lee, 2010; Terzis et al., 2013) also incorporated perceived confirmation and perceived ease of use to examine their relationship. In the context of OPRs, it is expected that customers' perceived confirmation would also be positively related to their perceived ease in using the OPRs. This means that as customers gain confirmation experience with OPRs use, the perceived ease of OPRs use will be updated and eventually, become more concrete. The more positive the confirmation of their experiences with the OPRs, the higher the belief will be that the OPRs are easy to use. Thus, the hypothesis formulated is as follow:

H_6 : Perceived confirmation is positively related to perceived ease of OPRs use.

4. Research Methodology

4.1 Construct Measurements

This study employed an online survey method to test the research hypotheses. Where possible, all the items measuring the research variables were adapted from prior studies and modified slightly to suit the context of the current study (Seale, 2004). An expert panel comprising five members consisting of two academicians, two online customers, and one e-retailer was consulted. A cover letter accompanied by an evaluation set containing the study purpose and instructions for validating constructs associated with the construct name, construct descriptions, and measurement items, were emailed to the expert panel members. Based on the expert panel's results, a number of minor changes were made to the construct items. This was accomplished by modifying the wording of the items to fit the context of this study. Two additional items were also included to the construct of perceived usefulness.

The measurements of perceived confirmation and customer satisfaction were adapted from the study by Bhattacherjee (2001). These measurments had also been used in several studies (i.e., Lee, 2010; Terzis et al., 2013) in various contexts. The first two measurement items of perceived usefulness, PU1 and PU2 were extracted from the expert

panel's recommendation while the remaining three items, PU3, PU4, and PU5 were adopted from Benlian et al. (2012). Perceived ease of use was measured through a scale adapted from Benlian et al. (2012). To further validate the instrument, the survey questionnaire was pre-tested by nine academicians from an institution of higher education in Malaysia. The measurements were modified slightly in light of their feedback.

Most of the items used a five point Likert scale with endpoints "1 for strongly disagree" and "5 for strongly agree" except for the satisfaction items which were measured by a five point semantic differential scale. One screening question was also included to determine whether respondents have used the OPRs in at least one instance of buying a product, in the last six months. Only responses from existing users of the OPRs were included into the data analysis. In order to confirm the reliability of the survey instrument, a pilot study with 50 Amazon customers was conducted. Results show that the constructs have a good internal consistency (all alpha values are greater than 0.80). The measurement of the study constructs are presented in Table 5.

4.2 Data Collection

This study focused on real users of the OPRs. Amazon customers were selected as the target population due to following reasons. First, Amazon is recognised as one of the leading e-commerce retailers, thus, serves as a positive example for other online shopping stores with regards to the way it supports the provision of the OPRs (Archak, Ghose, & Ipeirotis, 2011; Benlian et al., 2012). Second, Amazon customers are likely to present strong online buying power. Third, Amazon customers have exposure to OPRs while making online purchases. Fourth, a verified list of Amazon customers is available on the Amazon website that was used for administering the online survey. Since Amazon customers are geographically dispersed, online survey is more suitable and is an effective way to reach the target audience (Wright, 2005). A list of 140,000 customers is available on Amazon website. Each profile of the customers was visited and it was noted that majority of the customers had not disclosed their email addresses. The details of customers who voluntarily disclosed their email addresses were collected and this was then used for sending them a survey invitation via surveymonkey platform.

The online survey was conducted from mid-May to end of September, 2015. Via the survey, a total of 626 useable responses

were received. Of this, 329 (52.6 per cent) respondents were males and remaining were females. Almost all the respondents (92 per cent) were above 26 years old. Out of 626 respondents, 171 (27.3 per cent) respondents were specifically above 55 years old and 141 respondents (22.5 per cent) were in the 46-55 age group. Five respondents did not report their age. In looking at the geographical location of the respondents, it is noted that respondents were from 15 different countries with majority from the USA (45 per cent) and UK (14.1 per cent), followed by Germany (7.2 per cent), France (6.1 per cent), Italy (5.6 per cent), and Canada (4.8 per cent). The five point Likert scale was used to measure respondents' familiarity with Amazon and OPRs and the mean value shows that respondents have higher familiarity with Amazon (mean=4.81, SD=0.593) and OPRs (mean=4.62, SD=0.838). They also regularly visit Amazon (mean=4.32, SD=0.81). Demographic summary of the survey respondents is presented in Table 1.

Table 1: Demographic Summary of Survey Respondents (N=626)

Variables	Frequency(%)
Gender	
Male	329 (52.6)
Female	289 (46.2)
Missing Values	8 (1.3)
Age group	
Less than 20 years	6 (1.0)
20 - 25 years	37 (5.9)
26 - 35 years	110 (17.6)
36 - 45 years	156 (24.9)
46 - 55 years	141 (22.5)
More than 55 years	171 (27.3)
Missing Values	5 (0.8)
Online buying experience	
Less than 1 year	6 (1.0)
1 - 2 years	7 (1.1)
2 - 3 years	32 (5.1)
3 - 4 years	45 (7.2)
4 - 5 years	42 (6.7)
More than 5 years	494 (78.9)

OPR usage experience	
Less than 1 year	22 (3.5)
1 - 2 years	43 (6.9)
2 - 3 years	52 (8.3)
3 - 4 years	78 (12.5)
4 - 5 years	64 (10.2)
More than 5 years	367 (58.6)
Purchases over six month	
1 – 5	131 (20.9)
6 - 10	69 (6.7)
11 - 15	42 (2.1)
15 - 20	13 (03.4)
16 - 20	21 (11.0)
More than 20	350 (55.9)
Geographical Location	
Australia	26 (4.2)
Brazil	9 (1.4)
Canada	30 (4.8)
China	4 (0.6)
France	38 (6.1)
Germany	45 (7.2)
India	21 (3.4)
Ireland	1 (0.2)
Italy	35 (5.6)
Japan	8 (1.3)
Mexico	8 (1.3)
Netherlands	3 (0.5)
Spain	11 (1.8)
UK	88 (14.1)
USA	282 (45)
Other	3 (0.5)
Missing Values	14 (2.2)

4.3 Non-response Bias Analysis

Non-response bias is one of the major challenges for studies using survey as a data collection approach (Malhotra, 2010). Prior studies (e.g., Sax, Gilmartin, & Bryant, 2003) have suggested assessing the non-response bias, regardless of how high or low response rates are. In this study, non-response bias was examined by contrasting the first 100 and last 100 responses received. To check for non-response bias, a comparison of means on all study constructs was carried out by

using paired t-test. Results revealed that the significance value for all study constructs was above 0.05. Thus, it is concluded that there is no statistically significant difference in the means for these two groups. Based on this, it is deduced that respondents who did not respond to the survey will probably have the same perceptions of the constructs as those respondents who responded to the survey. Table 2 presents the results for non-response bias.

Table 2: Analysis of Non-response Bias

Variables		N	Mean	Std. Deviation	t- Statistics	Sig. (2-tailed)
CS	Early	100	3.576	0.954	-0.950	0.345
	Late	100	3.444	1.077		
PU	Early	100	3.691	1.169	-0.540	0.590
	Late	100	3.599	1.232		
EOU	Early	100	3.574	.9477	-1.156	0.122
	Late	100	3.786	1.023		
PC	Early	100	3.337	0.921	0.023	0.982
	Late	100	3.340	0.910		

Note: CS = Customer Satisfaction; PU = Perceived Usefulness; EOU= Perceived Ease of Use; PC = Perceived Confirmation

4.4 Common Method Bias Analysis

As this study employed a cross-sectional survey, common method bias (CMB) may be a concern in affecting study results. Therefore, this study used the following three techniques for CMB analysis: Harman's single factor procedure (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), correlation matrix (Pavlou, Liang, & Xue, 2006), and Unmeasured Latent Marker Variables (Podsakoff, Mackenzie, & Podsakoff, 2012; Liang, Saraf, Hu, & Xue, 2007). From the analysis done, Harman's single factor result shows that a single factor accounted for 36 per cent of the variance, which is less than 50 per cent of the rule of thumb. This indicates that CMB is unlikely to be a significant concern for this study. The correlation

matrix also shows that none of the constructs is highly correlated (less than 0.90). Although, Harman's single factor and the correlation test have been widely used, Guide and Ketokivi (2015) report that both tests are no longer acceptable as they do not address CMB at all. Therefore, this study employed an Unmeasured Latent Method Construct (ULMC), as suggested by Podsakoff et al. (2012) as additional caution.

To apply this technique into the SmartPLS, theoretical constructs of the research model and their relationships were created for the CMB analysis. Further, a single-item construct was also created for each item noted in the measurement model. Each substantive construct is linked to the single-item construct for the item that it comprises. This effectively makes each substantive construct in the model a second-order reflective construct. Additionally, a construct representing the common method construct was also created. This construct is reflectively composed of all the items of the instrument. Finally, paths were created between the method construct and each single-item construct. The ULMC result is shown in Table 3.

To interpret the findings, the coefficients of the paths (from substantive constructs to single-item constructs, as well as coefficients of paths from the common method construct to single-item constructs) were considered. Loadings are represented by λ in Table 3. For both the substantive and method constructs, the square of the loading is interpreted as the percentage of item-explained variance. If the method construct loadings are insignificant, and the percentages of item variance explained by the substantive constructs are substantially greater than those explained by the method construct, then CMB is confirmed to have minimal influence; thus, unlikely to be a significant concern. This rule of thumb was applied in the context of this study. Results show that majority of the method construct loadings are insignificant and the variance of the items of the substantive construct is substantially greater than that of the method construct. The average variance, because of the substantive construct, is 86.9 per cent versus 2.2 per cent for the method construct. This indicates that the effect due to the method construct is considerably smaller than that due to the substantial construct. In light of previous tests and the current results drawn from this procedure, it is thus concluded that these results indicate that a negligible effect is caused by the CMB; hence, it is not a significant concern for the current study.

Table 3: Unmeasured Latent Method Construct (ULMC) Results

Constructs	Indicators	Substantive Factor Loading (λs)	Variance Explained (λs^2)	Method Factor Loading (λm)	Variance Explained (λm^2)
Customer Satisfaction	CS1	0.891***	0.794	0.208	0.043
	CS2	0.952***	0.906	-0.026	0.001
	CS3	0.941***	0.885	-0.088	0.008
	CS4	0.915***	0.837	-0.093	0.009
Perceived Usefulness	PU1	0.913***	0.834	0.057	0.003
	PU2	0.942***	0.887	-0.063	0.004
	PU3	0.937***	0.878	0.016	0.000
	PU4	0.892***	0.796	0.086	0.007
	PU5	0.934***	0.872	0.073	0.005
Perceived Ease of Use	EOU1	0.962***	0.925	-0.044	0.002
	EOU2	0.971***	0.943	-0.039	0.002
	EOU3	0.957***	0.916	-0.030	0.001
	EOU4	0.914***	0.835	0.046	0.002
	EOU5	0.895***	0.801	0.072	0.005
Perceived Confirmation	PC1	0.972***	0.945	0.060	0.004
	PC2	0.889***	0.79	0.516***	0.266
	PC3	0.962***	0.925	-0.139	0.019
Average		0.932	0.869	0.036	0.022

Note: *** indicates significance at 1% level

4.5 Assessment of Multicollinearity

Multicollinearity refers to the relationships between explanatory variables. It occurs when there are strong dependencies among them (Pallant, 2010). The presence of multicollinearity can influence the results of the regression model which happens by reducing the ability to predict dependent variables and to determine the distinct effect of the explanatory variables (Hair, Black, Babin, & Anderson, 2010; Pallant, 2010). Multicollinearity is identified by checking the values of "Tolerance" and "Variance of Inflation Factor (VIF)" for each regression variable (Hair et al., 2010; Pallant, 2010). If the tolerance value is less than 0.10, and the VIF value is greater than 10, then it indicates that two predictors are highly correlated and may require further investigation (Hair, Black, Babin, Anderson, & Tatham, 2006). Results of the multicollinearity analysis reveal that all the tolerance values are 0.293 or higher, and the VIF values are less than 4. Consequently, the problem of multicollinearity is not an issue in this study. Table 4 presents the tolerance and VIF values for multicollinearity assessment.

Table 4: Multicollinearity Assessment

Dependent Variable	Independent Variables	Collinearity Statistics	
		Tolerance	VIF
Customer Satisfaction	Perceived Ease of Use	.920	1.087
	Perceived Usefulness	.293	3.407
	Perceived Confirmation	.382	2.619

5. Results

For data analysis, the study adopted a two-step procedure that was recommended by Anderson and Gerbing (1988). The same procedure had been adopted by several past studies (e.g., Handfiel, Cousins, Lawson, & Petersen, 2015; Selnes, 2013). In this analysis, the measurement model was first examined to measure reliability, convergent validity, and discriminant validity. Then, the structural model was tested via structural equation modeling (SEM). It uses the SmartPLS. Compared to the covariance-based SEM (CB-SEM), the PLS-SEM is more robust

than the multicollinearity and distributional variance in item properties. Further, it flexibly supports a variety of research variable types and so is more suitable when data are non-normal (Hair, Ringle, & Sarstedt, 2011). However, the PLS-SEM can simultaneously analyse how well the measures relate to each construct and whether the proposed hypotheses are supported.

5.1 Analysis of Measurement Model

Reliability refers to the extent to which a variable or a set of variables is consistent in what it is intended to measure (Hair et al., 2010). As shown in Table 5, Cronbach's Alpha values are 0.948 or higher, indicating that each construct exhibits a good internal reliability. In addition, the composite reliability estimates are 0.963 or higher thus, indicating a strong reliability (Hair et al., 2006). Convergent validity can be assessed by the values of the average variance extracted (AVE) which refers to the degree the construct identifies the variance of its indicators. The rule of thumb for convergent validity is that the AVE value must exceed 0.50 (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Moreover, confirmatory factor analysis (CFA) is also one other indicator of convergent validity. This study performed the CFA by using the PLS-SEM as a way to examine the inter-factor and cross-factor loadings. The convergent validity is realised if the items of each construct load exceed 0.70 on their respective construct than the other constructs (Hair et al., 2014). As shown in Table 5, loadings for all items of the reflective constructs are greater than 0.90, and the AVE values for all constructs are above the cut off point of 0.50. The AVE values are 0.865 or greater, indicating that at least 86.5 per cent of the variances observed in the items is accounted for by their hypothesised variables. Consequently, the convergent validity is achieved among all constructs.

Discriminant validity refers to the degree to which a construct is distinct from other constructs (Hair et al., 2010). According to Fornell-Larcker criterion, there are two ways to assess discriminant validity (Hair et al., 2010). First, the factor loading of each item must be greater than the cross loading of items of other constructs. Second, a comparison of square root of the AVEs with the correlation between the construct and other constructs. For the first type of discriminant analysis, the CFA analysis was performed and results show that the measurements of the constructs are more strongly loaded on their respective constructs than other constructs. For the second type of discriminant validity analysis,

Table 5: Descriptive Statistics, Reliability, and Convergent Validity

	Constructs and Measurements	N	Mean	S.D.	Factor Loading	Alpha Value	CR	AVE
Customer Satisfaction						0.948	0.963	0.865
How do you feel about your overall experience of OPR use?								
CS1.	Very dissatisfied/Very satisfied.	626	3.767	1.018	0.907			
CS2.	Very displeased/Very pleased.	626	3.619	1.055	0.949			
CS3.	Very frustrated/Very contented.	626	3.528	1.056	0.936			
CS4.	Absolutely terrible/Absolutely delighted.	626	3.473	1.036	0.929			
Perceived OPRs Usefulness						0.963	0.971	0.871
PU1.	OPR usage enabled me to evaluate the product.	626	3.717	1.106	0.933			
PU2.	OPR usage assisted me to understand the performance of the product.	626	3.811	1.091	0.951			
PU3.	OPR usage allowed me to accomplish more analysis than would otherwise be difficult.	626	3.842	1.144	0.922			
PU4.	OPR usage increase the quality of my judgments.	626	3.837	1.044	0.914			
PU5.	OPR usage enhanced my effectiveness in product evaluation.	626	3.715	1.116	0.945			
Perceived Ease of OPRs Use						0.968	0.975	0.888
To make an accurate product judgment, using the OPRs was								
EOU1	Easy for me.	626	3.522	1.280	0.943			
EOU2	Understandable.	626	3.532	1.252	0.961			
EOU3	Clear and simple.	626	3.467	1.258	0.964			
EOU4	Required less effort.	626	3.791	1.008	0.919			
EOU5	Required less time.	626	3.686	1.049	0.924			
Perceived Confirmation						0.962	0.976	0.930
PC1.	My experience with the OPRs was better than what I expected.	626	3.476	0.909	0.983			
PC2.	The service level provided by the OPRs was better than what I expected.	626	3.400	0.900	0.926			
PC3.	Overall, most of my expectations about the OPRs were confirmed.	626	3.476	0.909	0.983			

the square root of the AVE values for each construct is compared with the correlation values between the construct and other constructs (Chin, 2010; Thong et al., 2006). Table 6 shows the correlation matrix of constructs and the AVEs. Results reveal that the square root of all the AVE values are greater than the inter-construct correlation values thus, indicating the achievement of the discriminant validity.

Table 6: Discriminant Validity

Constructs	CS	PU	EOU	PC
Customer Satisfaction (CS)	**0.930**			
Perceived Usefulness (PU)	0.640	**0.933**		
Perceived Ease of Use (EOU)	0.432	0.447	**0.942**	
Perceived Confirmation (PC)	0.617	0.665	0.490	**0.964**

Note: Diagonal values are square root of AVEs and remaining values are correlations.

In addition to the above discussion, it is noted by Henseler, Ringle, and Sarstedt (2015) that the classical approaches (i.e. the Fornell-Larcker criterion and cross-loadings) do not reliably detect a lack of discriminant validity in cross-sectional survey based studies. To counter this, they propose a new technique based on the multitrait-multimethod matrix (HTMT) ratio which is able to address the discriminant validity in marketing studies. They further state that the HTMT approach is superior when compared to the Fornell-Larcker criterion and the assessment of cross-loadings. It is suggested that the HTMT test requires the calculation of a ratio of the average correlations between constructs to the geometric mean of the average correlations within items of the same constructs (Voorhees, Brady, Calantone, & Ramirez., 2016). Nonetheless, a set of guidelines on how to handle discriminant validity issues in the PLS-SEM is provided (see Henseler et al., 2015).

To obtain the HTMT results for the data, this study ran the bootstrapping routine in SmartPLS 3. The cut-off point for establishing the discriminant validity between two reflective constructs, as has been suggested by Henseler et al. (2015), is to be 0.85 and 0.90. However, $HTMT_{0.85}$ is noted to be the most conservative criterion. If the HTMT ratio is below 0.85, then discrimination validity between the two constructs is established. Results shown in Table 7 reveal that all HTMT ratios are

less than 0.85, indicating that there is no discriminant validity problem in the current study. In light of previous studies and the current results of the HTMT test, it is hereby established that discriminant validity is secured in this study.

Table 7: HTMT Results

Constructs	CS	PU	EOU	PC
Customer Satisfaction (CS)				
Perceived Usefulness (PU)	0.703			
Perceived Ease of Use (EOU)	0.596	0.746		
Perceived Confirmation (PC)	0.763	0.815	0.719	

5.2 Analysis of the Structural Model

Test of significance was performed by using the bootstrap re-sampling procedure (Hair et al., 2011; Hair, Hult, Ringle, & Sarstedt, 2013). The findings are encouraging. All six hypotheses are supported by the data. All but two of the path coefficients are larger than 0.305 and significant at p<.001. Overall, the model explains that 48.8 per cent of the variance related to OPRs is customer satisfaction and 46.2 per cent of the variances perceived usefulness of OPRs. In addition, perceived confirmation has the strongest impact on perceived usefulness ($\beta = 0.587$, p<.001) as compared to its impact on satisfaction ($\beta = 0.306$, p<.001) and perceived ease of use ($\beta = 0.490$, p<.001). Moreover, perceived ease of use significantly influences perceived usefulness ($\beta = 0.159$, p<.001), and together with perceived confirmation, it explains that 46.2 per cent of variance is noted in perceived usefulness. Additionally, perceived ease of use exhibits a statistically significant relationship with customer satisfaction ($\beta = 0.110$, p<0.001). As expected, perceived usefulness has a strongest impact on customer satisfaction ($\beta = 0.387$, p<.001), and together with perceived ease of use and perceived confirmation, it explains 48.8 per cent of the variance in customer satisfaction. The PLS results of the structural model are depicted in Figure 2.

This study also examined the predictive relevance (Q^2) and substantive effect (f^2) of the independent constructs. A predictive relevance (Q^2) was examined, based on the blindfolding technique (Hair

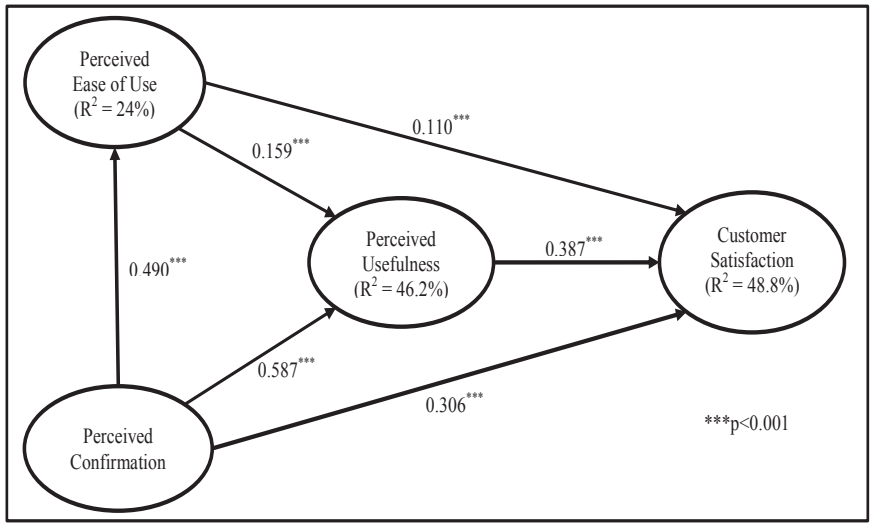

Figure 2: PLS Results of the Research Model Testing

et al., 2013, p. 203). The blindfolding technique depends on the omission distance (D) that determines which data points are specified and this is deleted systematically when applying the blindfolding procedure. However, as Q^2 values can be extracted and calculated for reflective dependent constructs only, this study used the blindfolding technique on customer satisfaction constructs by specifying the omission distance of D=7. According to Hair et al. (2013), the path will have a predictive relevance if Q^2 exceeds zero. By referring to Table 8, it can be seen that the values of Q^2 is reported to exceed zero whereas the substantative effect size (f^2) is the evaluation of R^2 in a case when a particular independent variable is removed from the research model. Consequently, it examines the effect size of the removed independent variable on the dependent variable (Hair et al., 2013). According to Hair et al. (2014), values of f^2 can be compared to 0.02, 0.15, or 0.35 for reporting, regardless of whether the independent variables have small, medium, or large effects respectively. As shown in Table 8, perceived usefulness (f^2=0.16) has medium effect whereas perceived confirmation (f^2=0.09) and perceived ease of use (f^2=0.02) have small effects on customer satisfaction.

Table 8. Assessments of Predictive Relevance (Q^2) and Substantative Effect (f^2)

Dependent Construct	Independent Construct	$Q^2_{included}$	$Q^2_{excluded}$	q^2	$R^2_{included}$	$R^2_{excluded}$	f^2
CS		0.411			0.484		
	EOU		0.403	0.02		0.475	0.02
	PU		0.344	0.15		0.402	0.16
	PC		0.369	0.07		0.436	0.09

Note: CS = Customer Satisfaction; PEU = Perceived Ease of Use; PU = Perceived Usefulness; PC = Perceived Confirmation

6. Discussion and Conclusion

The results drawn from this study strongly support the research model with all the hypothesised paths being noted as significant. The results also show that customers' perceived confirmation significantly influences their post-adoption beliefs (perceived ease of use and perceived usefulness) thus, supporting the argument of past studies (e.g., Lurudusamy & Ramayah 2016; Ramayah et al., 2016; Zhao et al., 2015; Ayanso et al., 2015; Lee, 2010; Thong et al., 2006) which stated that customers' various post-adoption beliefs are affected by their levels of confirmation. Moreover, results also reveal that Amazon customers placed more emphasis on perceived usefulness and perceived confirmation as compared to perceived ease of use in forming their levels of satisfaction with OPRs; whereas, results indicate that perceived usefulness of OPRs is the most salient predictor of customer satisfaction. As the recommender systems perform the resource-intensive information processing job of screening, narrowing, and sorting the available alternatives, customers can free up some of the processing capacity so as to be effectively evaluating alternatives and this can finally, affect their buying decision. If customers perceive that recommended products were not matching their needs best or if the OPRs were no longer effective in improving their buying decisions, then, with all other things being equal, they would prefer to rely on their own capabilities instead of just relying on the OPRs for making a better evaluation of the products.

Results drawn from this study also indicate that perceived ease of use has small but significant effect on customer satisfaction. It contradicts

with the argument of Bhattacherjee (2001) who did not include perceived ease of use in the ECM. Bhattacherjee (2001, p. 200) had claimed that "as users gain experience with the system, ease of use concerns seem to be resolved and displaced by more instrumental considerations involving the efficiency of the innovation to increase one's job performance". Contrary to this, the current finding has sufficient evidence which supports the findings of previous studies (e.g., Thong et al., 2006; Lee, 2010; Recker, 2010; Terzis et al., 2013) which mentioned the significant impact of perceived ease of use on user satisfaction. Therefore, the current results reaffirm the significant positive impact of perceived ease of use on customer satisfaction. Since regular introduction of new products and services result in continous change to OPRs, customers have to constantly update their perception of their cognitive efforts in using the OPRs.

Additionally, as the usability concern is linked to the perception of the cognitive efforts required for using the OPR (Huang et al., 2013; Xu et al., 2014) it is plausible to say that perceived ease of use could also have significant indirect impact on customer satisfaction through perceived usefulness of OPRs. Therefore, this claim deserves further attention from researchers. The findings imply that OPRs should be easy to use and require less time and effort to make an accurate product judgment. Similarly, if the technology of interest inherently requires its users to undergo a long and continuous learning process, the perceived ease of use may have a stronger impact on users' satisfaction. Past IS adoption literature had implicitly assumed that the technology of interest does not change or evolve over time, in terms of features and usage contexts. However, many technologies seem to be evolving and changing constantly so, users of such technologies (e.g., mobile internet services) need to update their expectations when using the technologies (Thong et al., 2006; Terzis et al., 2013). Hence, depending on the nature of a technology, users may have to go through a continuous learning process in order to use the technology. Based on this argument, it is deduced that perceived ease of use can exert influence on users' behaviour for an extended time period. Additionally, the results extended from the findings of TAM based studies (e.g., Benlian et al., 2012) had shown that perceived ease of use is a significant predictor of customer satisfaction, thereby, indicating its significance over both the adoption and the post-adoption stages.

In the context of online buying, both instrumental factors: perceived ease of use and perceived usefulness of OPRs are important for facilitating product evaluation and arriving at the product choice that fits into customer needs. Hence, customers' perception of the ease of use and usefulness of the OPRs should be considered while designing OPRs. The product recommender systems generate recommendations from a massive set of alternatives available on the e-commerce sites by providing a concise set of related products. Consequently, OPRs enable customers to cope with the overwhelming information burden, and also increase their ability and effectiveness in making satisfying buying decision. Therefore, customers' instrumental beliefs (i.e. perceived ease of use and perceived usefulness) of OPRs evaluation can play an important role in predicting customer satisfaction with OPRs. If customers perceive that OPRs are easy to use and are useful in terms of product evaluation and product selection, then they would be satisfied with the OPRs usage and subsequently, will use OPRs for future purchases.

In addition, the PLS findings indicate that perceived confirmation has direct and and indirect (via perceived ease of use and perceived usefulness) significant positive impact on satisfaction. This reflects the complex and dynamic interrelationship among customers' perceptions with regard to the expectation-confirmation model which encompasses the ease of use, usefulness, and satisfaction. None of these variables will ever become stable as they are continuously being updated by customers based on their experience with the OPRs. Customers' perceptions continue to be updated as long as they continue to use OPRs for purchase decisions. Consequently, OPRs practitioners should think about adopting a twofold strategy: (a) to inform new customers about the potential benefits of OPRs in terms of its usefulness and ease of use; and (b) to educate existing customers on how to use OPRs effectively so as to maximise confirmation of their expectations and subsequently, their level of satisfaction.

7. Theoretical and Practical Contributions

The findings of this study provide implications to both theory and practice. In the context of OPRs, no prior study had examined the role of instrumental beliefs (i.e. perceived ease of use and perceived usefulness) and social-psychological belief (i.e. perceived confirmation) in predicting

customer satisfaction with OPRs. This study has successfully tested the relationships which is likely to ensure a stable theory development. The empirical results show that the research model has good explanatory power in determining customer satisfaction which is a salient determinant of technology success.

In terms of contribution to practices, the significance of expectation-confirmation, ease of use, and usefulness of OPRs presents e-retailers with potential fruitful areas to affect customer satisfaction with OPRs. A major objective for e-retailers is for them to formulate strategies to manage customer expectations and this can be accomplished by increasing OPRs usefulness which is a saliant predictor of satisfaction with the OPRs. As a result, e-retailers will be able to increase their OPRs usage and hopefully, retain existing customers. Meanwhile, these satisfied customers can serve as an effective channel for bringing in new customers through the positive word-of-mouth promotion about OPRs usefulness.

The second important implication for e-retailers is that OPRs can never stand still because OPRs are subject to change due to the change in customers' preferences or their past buying behaviours. Consequently, OPRs can influence customers' perceptions of expectation-confirmation, ease of use, and usefulness of OPRs based on their updated experiences with OPRs. In addition, these variables, in particular the usefulness of OPRs can be further enhanced as changes occur within the external environment. For example, a newspaper article or industry report which states that e-retailers are deliberately employing various deceptive tactics by manipulating the OPRs for promoting an approach behaviour, may cause a setback for the OPRs. This may cause customers to re-evaluate their instrumental and social-psychological beliefs of OPRs evaluation which can subsequently, influence their attitude towards the instrumentality of OPRs in their buying decision. In this regard, e-retailers should think about employing different strategies for continuously developing customers' positive perception of OPRs instrumently. Otherwise, customers' perception about e-retailers' deceptive intention may cause them to rely on OPRs less even though customers may have greater perception of product values.

A third implication lies in understanding the relationship between perceived confirmation, ease of use, usefulness, and satisfaction. E-retailers should understand that making OPRs easy to use, on its own, may not lead to customer satisfaction but that usefulness of OPRs

in facilitating customers buying decision pays stronger dividends. Therefore, e-retailers should strive to increase usefulness of OPRs while making them easy to use for product evaluation.

Finally, since majority of the respondents of the current study were from western countries, the study findings can be beneficial to e-retailers located in the Asian region where targets are identified for the purpose of penetrating the global market, in particular Amazon customers. This study draws on the responses provided by Amazon customers.

8. Research Limitation and Future Research

A few study limitations along with future research recommendations should be noted. First, the current study used a cross-sectional design rather than a longitudinal design. It is noted that if the purpose of the study is to examine whether pre-adoption expectations actually changes after confirmation of experiences, then a longitudinal design is recommended as it can give a clearer picture of how the users' beliefs and the relationships among them changes over time. However, given that the objective of this study was to examine the impact of instrumental and social-psychological beliefs on customer satisfaction, a cross-sectional design was deemed more suitable. Second, concerns about common method bias (CMB) could arise due to cross-sectional survey. Although, this study had employed three techniques namely: Unmeasured Latent Marker Variable, Harman's one-factor test, and the Correlation matrix to validate results, future studies should explore other methods suggested by Podsakoff et al. (2012) as a means to address the CMB. Third, majority of the respondents were from non-Asian countries, which have a unique cultural environment that is unlike Asian countries, thus, the results cannot be generalised. Hence, the generalisability of the findings from western culture to Asian culture and other e-retailers (other than Amazon) will need to be further confirmed with additional studies. Fourth, this study shows that instrumental and social-psychological beliefs have significant impact on customer satisfaction. Thus, future studies may need to explore other factors that could impact these beliefs and how they can be manipulated to improve customer satisfaction with OPRs. Fifth, several past studies have shown that product type has significant moderating impact on the relationship between customers' beliefs and attitude. Hence, future research should explore the moderating impact of product type (e.g., search and experience products) on the relationships between study variables.

References

Ahmad, N., Omar, A., & Ramayah, T. (2010). Consumer lifestyles and online shopping continuance intention. *Business Strategy Series, 11*(4), 227-243.

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-423.

Archak, N., Ghose, A., & Ipeirotis, P.G. (2011). Deriving the pricing power of product features by mining consumer reviews. *Management Science, 57*(8), 1485-1509.

Ayanso, A., Herath, T.C., & O'Brien, N. (2015). Understanding continuance intentions of physicians with electronic medical records (EMR): An expectancy-confirmation perspective. *Decision Support Systems, 77*(September), 112-122.

Basak, E., & Calisir, F. (2015). An empirical study on factors affecting continuance intention of using Facebook. *Computers in Human Behavior, 48*(2), 181-189.

Baum, D., & Spann, M. (2014). The interplay between online consumer reviews and recommender systems: An experimental analysis. *International Journal of Electronic Commerce, 19*(1), 129-162.

Benbasat, I., & Wang, W. (2005). Trust in and adoption of online recommendation agents. *Journal of the Association for Information Systems, 6*(3), 72-101.

Benlian, A., Titah, R., & Hess, T. (2012). Differential effects of provider recommendations and consumer reviews in E-commerce transactions: An experimental study. *Journal of Management Information Systems, 29*(1), 237-272.

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly*, *25*(3), 351-370.

Brown, S.A., Venkatesh, V., & Goyal, S. (2012). Expectation confirmation in technology use. *Information Systems Research*, *23*(2), 474-487.

Chen, C.C., & Tseng, Y.D. (2011). Quality evaluation of product reviews using an information quality framework. *Decision Support Systems, 50*(March), 755-768.

Chen, S.C., Chen, H.H., & Chen, M.F. (2009). Determinants of satisfaction and continuance intention towards self-service technologies. *Industrial Management & Data Systems, 109*(9), 1248-1263.

Cheong, H.J., & Morrison, M.A. (2008). Consumers' reliance on product information and recommendations found in UGC. *Journal of Interactive Advertising, 8*(2), 38-49.

Cheung, M.Y., Luo, C., Sia, C.L., & Chen, H. (2007). *How Do People Evaluate Electronic Word-of-Mouth? Informational and Normative Based Determinants of Perceived Credibility of Online Consumer Recommendations in China*. Paper presented at the 11th Pacific Asia Conference on Information Systems held on 4-6 July 2007 at Auckland, New Zealand.

Chin, W.W. (2010). How to write up and report PLS analyses, In V.E.Vinzi, W.W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares: Concepts, Methods and Applications* (pp. 655-690). Berlin Heidelberg: Springer.

Chu, Y.Y. (2013). *How Much Sales Life is Attributed to Amazon's Recommendation Engine?* Available at https://www.quora.com/How-much-sales-lift-is-attributed-to-Amazons-recommendation-engine (accessed on 28 January 2016).

Devaraj, S., Fan, M., & Kohli, R. (2002). Antecedents of B2C channel satisfaction and preference: Validating e-commerce metrics. *Information Systems Research, 13*(3), 316-333.

Doman, J. (2011). *How Much Sales Life is Attributed to Amazon's Recommendation Engine?* Available at https://www.quora.com/How-much-sales-lift-is-attributed-to-Amazons-recommendation-engine (accessed on 28 January 2016).

eMarketer. (2012). *Big Data' Can Be Hard to Harness*. Available at http://www.emarketer.com/Article/Big-Data-Hard-Harness/1009064 *(*accessed on 25 January 2016).

Gogoi, P. (2007). Retailers take a tip from MySpace. *Business Week Online.* Available at http://www.businessweek.com/bwdaily/dnflash/content/feb2007/db200702 13626293.html. (accessed on 20 November 2015).

Griffiths, J.R., Johnson, F., & Hartley, R.J. (2007). User satisfaction as a measure of system performance. *Journal of Librarianship and Information Science, 39*(3), 142-152.

Guide, V.D.R., & Ketokivi, M. (2015). Notes from the Editors: Redefining some methodological criteria for the journal. *Journal of Operations Management*, *37*(July), v-viii.

Hair, J., Black, B., Babin, B., & Anderson, R. (2010). *Multivariate Data Analysis*. NJ: Pearson Prentice Hall.

Hair, J., Sarstedt, M., Hopkins, L., & Kuppelwieser, G.V. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, *26*(2), 106-121.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2006). *Multivariate Data Analysis* (Vol. 6). NJ: Pearson Prentice Hall.

Hair, J.F., Hult, G.T.M., Ringle, C., & Sarstedt, M. (2013). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. New York: Sage Publications.

Hair, J.F., Ringle, C.M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139-152.

Handfield, R.B., Cousins, P.D., Lawson, B., & Petersen, K.J. (2015). How can supply management really improve performance? A knowledge-based model of alignment capabilities. *Journal of Supply Chain Management*, *51*(3), 3-17.

Häubl, G., & Murray, K.B. (2006). Double agents: Assessing the role of electronic product recommendation systems. *Sloan Management Review, 47*(3), 8-12.

Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115-135.

Hess, T.J., McNab, A.L., & Basoglu, K.A. (2014). Reliability generalization of perceived ease of use, perceived usefulness, and behavioral intentions. *MIS Quarterly*, *38*(1), 1-28.

Hong, S., Kim, J., & Lee, H. (2008). Antecedents of use-continuance in information systems: Toward an inegrative view. *The Journal of Computer Information Systems, 48*(3), 61-73.

Hostler, R.E., Yoon, V.Y., & Guimaraes, T. (2005). Assessing the impact of internet agent on end users' performance. *Decision Support Systems, 41*(1), 313-323.

Hong, Y., & Pavlou, P.A. (2010). *Product Uncertainty in Online Marketplaces in China: An Econometric Model.* Paper presented at the America's Conference on Information Systems held on 12-15 August 2010 at Lima, Peru.

Hou, C.K. (2012). Examining the effect of user satisfaction on system usage and individual performance with business intelligence systems: An empirical study of Taiwan's electronics industry. *International Journal of Information Management, 32*(6), 560-573.

Hsu, C.S., Chou, S.W., & Min, H.T. (2014). *Understanding Post-Adoption of Online Shopping Continuance Usage Through the Social Exchange Theory.* Paper presented at the 18th Pacific Asia Conference on Information Systems held on 24-28 June 2014 at Chengdu, China.

Huang, L., Tan, C.H., Ke, W., & Wei, K.K. (2013). Comprehension and assessment of product reviews: A review-product congruity proposition. *Journal of Management Information Systems, 30*(3), 311-343.

Huang, Y.M., Huang, Y.M., Huang, S.H., & Lin, Y.T. (2012). A ubiquitous English vocabulary learning system: Evidence of active/passive attitudes vs. usefulness/ease-of-use. *Computers & Education*, *58*(1), 273-282.

Komiak, S., & Benbasat, I. (2006). The effects of personalization and familiarity on trust and adoption of recommendation agents. *MIS Quarterly, 30*(4), 941-960.

Komiak, S., Wang, W., & Benbasat, I. (2005). *Comparing Customer Trust in Virtual Salespersons with Customer Trust in Human Salespersons.* Paper presented at the 38th Annual Hawaii International Conference on System Sciences held on 3-6 January 2005 at Big Island, Hawaii, USA.

Kumar, N., & Benbasat, I. (2006). Research note: The influence of recommendations and consumer reviews on evaluations of websites. *Information Systems Research, 17*(4), 425-439.

Lee, M.C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation-confirmation model. *Computers & Education, 54*(2), 506-516.

Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. *MIS Quarterly*, *31*(1), 59-87.

Lin, C.S., Wu, S., & Tsai, R.J. (2005). Integrating perceived playfulness into expectation-confirmation model for web portal context. *Information & Management, 42*(5), 683-693.

Lin, Z. (2014). An empirical investigation of user and system recommendations in e-commerce. *Decision Support Systems, 68*(December), 111-124.

Luqman, A., Razak, R.C., Ismail, M., & Alwi, M.A.M. (2016). *Predicting Continuance Intention in Mobile Commerce Usage Activities: The Effects of Innovation Attributes*. Paper presented at the 8th International Conference on Humanities and Social Sciences held on 27-29 May 2016 at Selangor, Malaysia.

Lurudusamy, S.N., & Ramayah, T. (2016). The antecedants of broadband Internet adoption and continuance usage in Malaysian household context. *Journal of Theoretical and Applied Information Technology*, *88*(3), 476-491.

Malhotra, N.K. (2010). *Marketing Research: An Applied Orientation*. New Jersey: Pearson Education.

Mckinsey. (2013). *How Retailers Can Keep Up With Customers*. Available at http://www.mckinsey.com/insights/consumer_and_retail/how_retailers_can_keep_up_with_consumers (accessed on 27 January 2016).

Montaner, M., López, B., & De La Rosa, J.L. (2003). A taxonomy of recommender agents on the internet. *Artificial Intelligence Review, 19*(4), 285-330.

Mudambi, S.M., & Schuff, D. (2010). What makes a helpful online review? A study of customer reviews on Amazon. com. *MIS Quarterly, 34*(1), 185-200.

Myers, D.G. (2015). *Exploring Social Psychology*. New York: McGraw-Hill Education.

Oghuma, A.P., Libaque-Saenz, C.F., Wong, S.F., & Chang, Y. (2015). An expectation-confirmation model of continuance intention to use mobile instant messaging. *Telematics and Informatics*, *33*(1), 34-47.

Pallant, J. (2010). *A Step by Step Guide to Data Analysis using the SPSS Program*. *SPSS Survival Manual*. Australia: Allen and Unwin Books.

Parboteeah, D.V., Valacich, J.S., & Wells, J.D. (2009). The influence of website characteristics on a consumer's urge to buy impulsively. *Information Systems Research, 20*(1), 60-78.

Park, D.-H., & Lee, J. (2009a). eWOM overload and its effect on consumer behavioral intention depending on consumer involvement. *Electronic Commerce Research and Applications, 7*(4), 386-398.

Park, C., & Lee, T.M. (2009b). Information direction, website reputation and eWOM effect: A moderating role of product type. *Journal of Business Research, 62*(1), 61-67.

Pavlou, P.A., Liang, H., & Xue, Y. (2006). Understanding and mitigating uncertainty in online environments: A principal-agent perspective. *MIS Quarterly, 31*(1), 105-136.

Podsakoff, P.M., MacKenzie, S.B., & Podsakoff, N.P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63(1)*, 539-569.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Premkumar, G., & Bhattacherjee, A. (2008). Explaining information technology usage: A test of competing models. *Omega*, *36*(1), 64-75

Puzakova, M., Rocereto, J.F., & Kwak, H. (2013). Ads are watching me: A view from the interplay between anthropomorphism and customisation. *International Journal of Advertising, 32*(4), 513-538.

Ramayah, T., Ling, N.S., Taghizadeh, S.K., & Rahman, S.A. (2016). Factors influencing SMEs website continuance intention in Malaysia. *Telematics and Informatics*, *33*(1), 150-164.

Recker, J. (2010). Continued use of process modeling grammars: The impact of individual difference factors. *European Journal of Information Systems, 19*(1), 76-92.

Robinson, J.P., Shaver, P.R., & Wrightsman, L.S. (2013). *Measures of Personality and Social Psychological Attitudes: Measures of Social Psychological Attitudes*. New York: Academic Press.

Santhanamery, T., & Ramayah, T. (2014). Explaining the e-Government usage using expectation confirmation model: The case of electronic tax filing in Malaysia. In L.G. Anthopoulos & C.G. Reddick (Eds.), *Government e-Strategic Planning and Management* (pp. 287-304). New York: Springer.

Sax, L.J., Gilmartin, S.K., & Bryant, A.N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education*, *44*(4), 409-432.

Seale, C. (2004). *Researching Society and Culture*. London: Sage.

Selnes, F. (2013). An examination of the effect of product performance on brand reputation, satisfaction and loyalty. *Journal of Product & Brand Management, 2*(4), 45-60.

Sharabati, M. (2014). *The Impact of E-procurement System Qualities and Trust on End-user Satisfaction.* Unpublished PhD thesis, University of Malaya, Kuala Lumpur.

Sheng, X., & Zolfagharian, M. (2014). Consumer participation in online product recommendation services: Augmenting the technology acceptance model. *Journal of Services Marketing, 28*(6), 460-470.

Sheng, X., Li, J., & Zolfagharian, M.A. (2014). Consumer initial acceptance and continued use of recommendation agents: Literature review and proposed conceptual framework. *International Journal of Electronic Marketing and Retailing, 6*(2), 112-127.

Sun, Y., Liu, L., Peng, X., Dong, Y., & Barnes, S.J. (2014). Understanding Chinese users' continuance intention toward online social networks: An integrative theoretical model. *Electronic Markets, 24*(1), 57-66.

Terzis, V., Moridis, C.N., & Economides, A.A. (2013). Continuance acceptance of computer based assessment through the integration of user's expectations and perceptions. *Computers & Education, 62(1)*, 50-61.

Thong, J.Y., Hong, S.J., & Tam, K.Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International Journal of Human-Computer Studies, 64*(9), 799-810.

Tsai, C.C., & Chuang, H.M. (2011). The role of cognitive decision effort in electronic commerce recommendation system. *World Academy of Science, Engineering and Technology, 5*(10), 1087-1091.

Voorhees, C.M., Brady, M.K., Calantone, R., & Ramirez, E. (2016). Discriminant validity testing in marketing: An analysis, causes for concern, and proposed remedies. *Journal of the Academy of Marketing Science*, *44*(1), 119-134.

Wang, W., & Benbasat, I. (2004). Trust and distrust building processes in online recommendation agents: A process-tracing analysis. *Working Paper 04-MIS-003.* MIS Division, Sauder School of Business, University of British Columbia, Vancouver.

Wang, W., & Benbasat, I. (2009). Interactive decision aids for consumer decision making in e-commerce: The influence of perceived strategy restrictiveness. *MIS Quarterly, 33*(2), 293-320.

Weathers, D., Sharma, S., & Wood, S.L. (2007). Effects of online communication practices on consumer perceptions of performance uncertainty for search and experience goods. *Journal of Retailing, 83*(4), 393-401.

Wright, K.B. (2005). Researching Internet based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer Mediated Communication, 10*(3), 00-00 (doi: 10.1111/j.1083-6101.2005.tb00259.x).

Xiao, B., & Benbasat, I. (2007). E-commerce product recommendation agents: Use, characteristics, and impact. *MIS Quarterly, 31*(1), 137-209.

Xu, J., Benbasat, I., & Cenfetelli, R.T. (2014). The nature and consequences of trade-off transparency in the context of recommendation agents. *MIS Quarterly, 38*(2), 379-406.

Yoon, S.J. (2002). The antecedents and consequences of trust in online-purchase decisions. *Journal of Interactive Marketing*, *16*(2), 47-63.

Zha, X., Li, J., & Yan, Y. (2013). Information selfefficacy and information channels: Decision quality and online shopping satisfaction. *Online Information Review, 37*(6), 872-890.

Zhang, P. (2007). Toward a positive design theory: Principles for designing motivating information and communication technology. *Advances in Appreciative Inquiry*, *2*(1), 45-74.

Zhao, Y., Deng, S., & Zhou, R. (2015). Understanding mobile library apps continuance usage in China: A theoretical framework and empirical study. *Libri*, *65*(3), 161-173.