ANTECEDENTS OF ONLINE PRODUCT RECOMMENDATION CONTINUOUS USAGE INTENTION

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KUALA LUMPUR

2016

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THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

FACULTY OF BUSINESS AND ACCOUNTANCY
UNIVERSITY OF MALAYA
KUALA LUMPUR

2016

UNIVERSITY OF MALAYA

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ABSTRACT

Immense product choices, the complexity, and enormous amount of information available on business to consumer (B2C) e-commerce site challenge customers' limited information processing capabilities, and identifying a product which fits their need is not an easy job. There is also consumers' dilemma of wanting to have more information on the one hand and being overloaded with too much information on the other hand. Therefore, to help consumers deal with this dilemma, e-retailers are increasingly equipping their e-commerce sites with distinct product recommender systems to provide highly personalized product recommendations, and assistance in searching, comparing, and evaluating product information. The online product recommendation (OPR) also consisting of past consumer recommendations in the form of product ratings and reviews, which pursued the customers to buy recommended products. It subsequently can be resulted in higher consumer spending and improved retention rate. However, drawing benefits out of these advantages depends on whether and to what extent consumers embrace and fully utilise OPR. The current percentage of Amazon sales based on OPR usage indicated that a large proportion of online consumers are not using OPR for their online buying decision given the fact that they have not yet developed trust in OPR. Nevertheless, no matter how useful OPR is, a critical issue is whether consumers accept and continue OPR use. This is an important yet neglected issue in existing OPR research. Therefore, the current study develops an integrated research model to investigate salient determinants of OPR continuous usage intention and to understand how they influence the dependent variable.

With regards to that, this study specifies four research issues. First, to identify the factors that can be used as surrogate measure of OPR performance in terms of OPR usage outcomes. Second, to identify the factors that measure the consumers' OPR evaluation

beliefs in terms of their instrumental, social-psychological, and affective beliefs. Third, to ascertain how the consumers' perception of OPR performance influences their behavioural intention towards OPR continuous usage. Fourth, to examine the impact of OPR evaluation factors on consumers' perception of OPR performance. However, four theoretical models; IS continuance model, effort-accuracy model, theory of trust formation, and flow theory, were adopted and integrated to describe the causal linkages between the determinants of OPR performance and OPR continuous usage intention. Subsequently, six main hypotheses were developed and tested based on the integrated research model.

A questionnaire that reflects the research constructs is developed to collect the primary data for this study. The data were collected from 626 Amazon customers who have used OPR for their buying decision over at least six months. Since this study is quantitative with a deductive approach, it employs Partial Least Squares-Structural Equation Modelling (PLS-SEM) to validate and confirm research model by testing the relationships that were hypothesized. The findings of this study provide empirical evidences on the salient determinants of OPR continuous usage intention. The PLS results showed that all evaluation factors (i.e. ease of use, usefulness, confirmation, trust, and enjoyment) have statistically proven significant impact on OPR performance, except perceived ease of use. Furthermore, the study findings approve the influence of OPR performance on consumers' OPR continuous usage intention for future buying decision. The findings indicated that consumers' perceived decision effort, decision quality, and satisfaction representing OPR performance are direct determinants of OPR continuous usage intention and indirect measure of actual OPR continuous usage behaviours. Finally, research implications, limitations, and future researches are highlighted.

ABSTRAK

Kelambakan pilihan produk, kerumitan dan terlalu banyak maklumat yang terdapat di tapak *B2C* e-dagang mencabar had keupayaan pelanggan dalam mentafsir maklumat. Untuk mengenal pasti produk yang sesuai bagi mereka bukanlah satu tugas yang mudah. Pelanggan berada di dalam dilema samada mahu lebih maklumat atau terlalu banyak maklumat. Maka, untuk membantu pelanggan menghadapi dilema tersebut, *e-peruncit* terus menerus menerapkan tapak *e-dagang* mereka dengan sistem pengesyoran produk yang berbeza untuk menyediakan pengesyoran yang tertumpu kepada peribadi, membantu dalam pencarian, membanding dan menilai maklumat produk. Pengesyoran produk dalam talian *(OPR)* ini yang terdiri daripada ulasan pengguna, mempunyai keupayaan untuk menarik pelanggan lain membeli produk yang dicadangkan, secara langsung meningkatkan perbelanjaan dan kadar pengekalan yang tinggi. Akan tetapi, kelebihan yang nyata bergantung kepada bagaimana pelanggan mempercayai dan menggunakan *OPR*. Peratusan jualan *Amazon* terkini berdasarkan penggunaan *OPR* menyatakan bahawa sebahagian besar pelanggan dalam talian tidak menggunakan *OPR* semasa pembelian kerana meraka masih belum mempunyai kepercayaan berterusan terhadap *OPR*. Walau bagaimanapun, sebaik mana *OPR* tersebut, isu kritikalnya adalah samada pelanggan dapat menerima dan terus menggunakan *OPR* tersebut. Ini isu utama yang seringkali diambil mudah dalam kajian *OPR* yang sedia ada. Oleh itu, kajian ini membangunkan sebuah model integrasi kajian untuk mengkaji faktor-faktor selepas penerimaan yang mempengaruhi niat pelanggan dalam meneruskan *OPR*. Maka, kajian ini tertumpu kepada empat isu kajian. Pertama, untuk mengenalpasti faktor-faktor yang boleh dijadikan sebagai gantian pengukuran prestasi *OPR* dalam konteks hasil penggunaan *OPR*. Kedua, untuk mengenalpasti faktor-faktor yang mengukur nilai kepercayaan *OPR* pengguna dalam konteks instrumental, sosial-psikologi, dan kepercayaan afektif. Ketiga, untuk memastikan samada pandangan pengguna terhadap

prestasi *OPR* mempengaruhi niat tingkah laku mereka terhadap kesinambungan *OPR*. Keempat, untuk mengkaji impak faktor-faktor penilaian *OPR* terhadap pandangan pengguna bagi prestasi *OPR*. Empat model teori; model kesinambungan sistem maklumat (*IS)*, model usaha-ketepatan, teori pembentukan kepercayaan, dan teori aliran, telah digunapakai dan diintegrasi bagi menggambarkan hubungan sebab antara pembolehubah-pembolehubah prestasi *OPR* dan niat menggunakan *OPR*. Akibat dari itu, enam hipotesis utama telah dibentuk dan diuji berdasarkan model kajian integrasi tersebut.

Satu soal selidik yang melambangkan bentuk kajian yang dikemukakan telah direka bagi mengumpul data utama dalam kajian ini. Data ini dikumpul daripada 626 orang pelanggan *Amazon*, yang menggunakan *OPR* untuk membuat keputusan belian. Kajian ini mengikut pendekatan kuantitatif-deduktif. Ia menggunakan model *partial least squares-structural equation modelling (PLS- SEM)* bagi memasti dan mengesahkan model penyelidikan dengan menguji hubungan yang telah dihipotesiskan. Hasil dari kajian ini memberi bukti empirikal bagi impak ketara dalam kepercayaan penilaian pengguna terhadap prestasi *OPR*. Keputusan *PLS* menunjukkan bahawa semua faktor penilaian (kemudahgunaan, kegunaan, pengesahan, kepercayaan dan keseronokan) memberi impak ketara secara statistik dalam prestasi *OPR*, kecuali faktor kemudahgunaan. Selain itu, hasil kajian mengesahkan pengaruh prestasi *OPR* terhadap niat meneruskan *OPR* bagi pembelian di masa hadapan. Ia menunjukkan persepsi pengguna dalam usaha keputusan, kualiti keputusan dan kepuasan mewakili prestasi *OPR* adalah peramal secara langsung bagi niat meneruskan *OPR*. Akhirnya, pelbagai kesan kajian, batasan, dan pengesyoran kajian masa hadapan diketengahkan.

ACKNOWLEDGEMENTS

All praise to Allah SWT Who is the only Creator and Sustainer of this world. To begin with, I would like to convey my honest gratitude to Allah SWT for enabling me to complete this Doctoral research.

Above all, I would like to convey my deepest appreciation, thanks, and sincere gratitude to my supervisors, Prof. Ainin Sulaiman and Associate Prof. Dr. Noor Ismawati Jaafar; for their continuous encouragement, support, and constructive guidance throughout my Doctoral journey. I believe this research would not have been completed without their helpful guidance and close follow-up through the duration of the research.

I would also like to extend my sincere thanks and deep appreciation to the COMSATS Institute of Information Technology, Islamabad, Pakistan for providing financial assistance for my doctoral study at University of Malaya, Kuala Lumpur.

I humbly dedicate this Doctoral thesis to my family and parents, the sparkling diamonds I have been gifted, they have been sources of the inspiration and willpower that I enjoyed along the way. Their faith, love, prayers, understanding and financial support are my true power.

I would also like to acknowledge my beloved wife; Wareesa Shareef and my dearest son; Muhammad Mahad Ashraf, for their patience and understanding, which was the wind beneath my wings.

Last but not least, I would also like to express deepest gratitude to all of my friends, particularly Dr. Sadeeq Ali, for invaluable advices and support in my research journey, they fulfil my life in Malaysia with joy and memorable experience.

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CHAPTER 1

INTRODUCTION

1. Introduction

This chapter consists of seven sections. The first section presents the background of the study. The second section provides detailed description of the research problem. In the third section, scope of the study is presented. While the fourth section specifies the research questions and objectives, and underlying research issues are discussed briefly. Next, a brief justification of using four theoretical models is presented in the fifth section. Following that, the sixth section explains the significance and motivation of this study. Finally, in the seventh section, the organization of the study is outlined with a brief description of each chapter.

1.1. Background of the Study

Due to the rapid growth of electronic commerce (e-commerce), consumers' buying decisions are increasingly made in an online environment (Xiao & Benbasat, 2007). Over the last decade, business to consumer (B2C) e-commerce sales have increased on an average of 19 percent per year, which is far more than that of the offline retail sales (Nakache, 2010). Even during the financial crisis in 2009, when offline retail sales decreased 2.0 percent, B2C e-commerce sales increased by 1.4 percent (Nakache, 2010). The rapidly growing population of online consumers and improvements in online services drives B2C e-commerce (Qahri Saremi, 2014), which is indicated by various industry reports. For example, eMarketer (2014) forecasted that online sales would increase from $1.25 trillion in 2013 to reach $2.36 trillion by 2017. It is predicted that the online sales would grow at an average rate of 17.4 percent per year between 2013 and 2017

(eMarketer, 2014). B2C e-commerce appeals the online consumers, because it offers them great convenience, immense product choices, significant amount of product-related information, cost saving avenue, and reduce waiting times (Qahri Saremi, 2014; Xiao & Benbasat, 2007). Similarly, it also appeals to e-retailers, because they can reach consumers who are unreachable through offline channels and subsequently reduce their operational cost (Mahadevan, 2000; Molla & Licker, 2005; Rosen & Howard, 2000).

In contrast to offline consumers, online consumers cannot try or experience the products before buying them, which significantly increases their level of uncertainty about the products' quality and subsequently hinders their online buying decision (Benlian, Titah, & Hess, 2010, 2012; Hong & Pavlou, 2010; Park & Lee, 2009a). The online customers are usually uncertain as to whether the products meet their needs or perform up to their expectations (Weathers, Sharma, & Wood, 2007). Additionally, immense product choices, the complexity, and enormous amount of information also challenge consumers' limited information processing capabilities (Sheng et al., 2014; West et al., 1999). Consequently, past studies (Xiao & Benbasat, 2007) reflected that due to consumers' limited cognitive capacity of information processing, identifying a product which fits their need is not an easy job. Moreover, there is also consumers' 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). Therefore, to help consumers deal with this dilemma, e-retailers (e.g. Amazon) are increasingly equipping their e-commerce sites with distinct product recommender systems to provide highly personalized product recommendations, and assistance in searching, comparing, and evaluating product information (Puzakova, Rocereto, & Kwak, 2013; Sheng et al., 2014). These online product recommendations are becoming increasingly available on e-commerce sites to improve consumers' decision quality, and help both consumers and e-retailers to

minimize the ever increasing overload of information (Benlian et al., 2012, p. 238). The online product recommendation [hereafter, it is called OPR] persuade the consumers to buy recommended product, which can result in higher consumers spending and improved retention rates (eMarketer, 2012). The recommender systems recommend products to consumers by analyzing their profiles and preferences (e.g. consumers' past buying behavior), or the post-consumption experiences of past consumers (e.g. online reviews) (Benlian et al., 2010, 2012; Xiao & Benbasat, 2007).

Past studies (Baum & Spann, 2014; Benlian et al., 2012; Weathers et al., 2007) highlighted two distinct types of online recommendations: (1) system generated recommendations using product recommender systems, and (2) consumers generated recommendations via product ratings and online reviews. Xiao and Benbasat (2007) stated that recommender systems elicit the interests and preferences of consumers for products either explicitly or implicitly, in order to generate product recommendations. The primary objective of recommender system is to minimize information overload and uncertainty about 'product fit' by helping consumers in selecting suitable product that best fits their needs (Sheng et al., 2014; Xiao & Benbasat, 2007). In order to make website sales efficient, different types of recommendation agents have been designed based on various filtering techniques, and embedded on the e-commerce site (Benlian et al., 2012; Xu, Benbasat, & Cenfetelli, 2014). There are two major filtering techniques of the recommender system: content-based filtering and collaborative-based filtering (Wei, Moreau, & Jennings, 2005). Content-based filtering refers to a technique based on a set of algorithms which drives recommendations for consumers based on their profile or information taken from their past online purchasing and searching behavior (Ansari, Essegaier, & Kohli, 2000). For instance, a recommender system based on content filtering technique recommends products to customers based on their expressed preferences for a

product or based on their past purchasing or searching history. In contrast to content-based filtering, collaborative-based filtering recommendations resemble the word of mouth recommendations and track the behavior of like-minded customers to drive recommendations for a particular customer (Ariely, Lynch, & Aparicio, 2004; Benlian et al., 2012). These recommendations are originated based on statistical analysis of patterns drawn from data of product ratings explicitly given by other consumers or by implicitly tracking the shopping behavior of other customers through recommender system (Montaner, López, & De La Rosa, 2003). For instance, a collaborative-based recommender system recommends products to customers because other like-minded customers in the same affinity group have bought the product or strongly recommended it. These like-minded customers refer to a group of customers who share similar purchasing preferences for various product attributes (Benlian et al., 2012). However, these recommendations contain brief description of a product and provide key product attributes-related information (e.g. price, screen size, hard drive size, processor of a laptop).

Online recommendations are also generated from product ratings and consumer reviews based on post-consumption experience (Benlian et al., 2012; Lin, 2014). Majority of e-retailers allow the consumers to share their post-consumption experience. Various e-retailers provide platform to the consumers for sharing their post-consumption experience. Amazon is the first to provide a platform where consumers can post their opinions about its products (Lin, 2014). These consumer reviews are considered as an important source of explanatory information and product recommendations (Benlian et al., 2012; Duan, Gu, & Whinston, 2008; Huang, Tan, Ke, & Wei, 2013). They are useful in helping potential customers in arriving to their purchase decision, because their reviews offer indirect experiences of the products (Park & Lee, 2009b), greater credibility and

relevance than seller-oriented information (Bickart & Schindler, 2001). However, due to the significance of consumer reviews, e-retailers are increasingly equipping their sites with distinct recommender systems, which also provide consumers reviews along with sellers' provided information for recommended products. For example, Amazon recommender system provide product recommendations which incorporate product rating and consumer reviews in addition to sellers' provided information (Benlian et al., 2010, 2012; Lin, 2014). The product ratings and consumer reviews refer to the consumer generated recommendations (Benlian et al., 2010, 2012; Lin, 2014). Figure 1.1 presents an Amazon recommendation page to illustrate system generated recommendation that contains product ratings and consumer reviews in addition to seller's provided information of product attributes. This type of OPR effectively assists consumers to minimize cognitive efforts (Todd & Benbasat, 2000), increase quality of buying decision (Häubl & Murray, 2006; Häubl & Trifts, 2000), and decrease the negative effect of information overload (Aljukhadar, Senecal, & Daoust, 2010, 2012; Bollen, Knijnenburg, Willemsen, & Graus, 2010).

Figure 1.1: Amazon Online Product Recommendation (OPR) Web Page

The OPR is becoming increasingly available on e-commerce sites and gaining popularity among online customers due to the benefits of lower information overload and enhanced decision quality (Park & Lee, 2009b). Gogoi (2007) reported that at least 43 percent of e-retailers already offer OPR for advising consumers in their buying decision. Additionally, several past studies (e.g. Benlian et al., 2012; Cheung, Luo, Sia, & Chen, 2009; Huang, 2014; Huang et al., 2013; Xiao & Benbasat, 2007; Xu et al., 2014; Zhu & Zhang, 2010) also highlighted that OPR can influence the customers' beliefs, attitude, and behavioral response in online buying decision process. These studies reflect that academicians and practitioners have been showing interest to investigate the role of OPR in the success of e-commerce transactions.

1.2. Research Problem Statement

With the rapid growth of Internet, numerous e-retailers (e.g. Amazon) have dedicated great effort and large sum of money to implement various information system (IS) applications in increasing their sales. The OPRs generated by product recommender systems: the target IS enabled service investigated in this study; is gradually becoming important in online buying decision process (Benlian et al., 2012). In this study, OPR refers to system generated recommendation which also incorporate past consumers' recommendations in the form of product ratings and consumer reviews. They are integrated in OPR, perhaps with the purpose of providing more relevant information in order to improve buying decision or to enhance the effectiveness of system generated recommendations (Benlian et al., 2012; Kumar & Benbasat, 2006; Lin, 2014). Recently, Baum and Spann (2014) investigated the impact of interplay between system recommendations and consumer reviews on customers' intention to follow OPR. They demonstrated that by providing positive opinions of past consumers with system

generated recommendations, e-retailers may increase the effectiveness of their recommender system which, in turn, results in positive impact on consumers' purchase decision. Similarly, Benlian et al. (2012) reported that OPR help online consumers in reducing their uncertainty about product quality inspection and arriving at a buying decision.

Several past studies (e.g. Sheng et al., 2014) have highlighted that the complexity and massive amount of information challenge consumers' limited information processing capabilities as shown in 'Internet fatigue' phenomenon (Horrigan, 2008). Moreover, there is also consumers' 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). In order to cope with this dilemma of information overload, e-retailers provide OPR which assist the consumers in searching, comparing, and evaluating alternate products (Puzakova et al., 2013). Consequently, OPR reduces cognitive efforts in decision-making (Todd & Benbasat, 2000), improves decision quality (Häubl & Murray, 2006; Häubl & Trifts, 2000), and decrease the negative effect of information overload on quality of their product choice (Aljukhadar et al., 2010, 2012; Bollen et al., 2010). However, the actualisation of these advantages depends on whether and to what extent consumers embrace and fully utilise OPR.

In contrast to the above significance of OPR highlighted in the past researches, the current percentage of sales based on OPR usage indicated that a large proportion of online consumers are still not using OPR for their buying decision. For example, industrial report by MacKenzie, Meyer, and Noble (2013) highlighted that Amazon generates up to 30% of sales from OPR, indicating relatively low OPR usage rate. This might imply that consumers have not yet developed trust in OPR performance (Sheng et al., 2014). In

addition, past studies (Xiao & Benbasat, 2011) have also reported that consumers have doubt on the OPR trustworthiness and performance, because e-retailers may deliberately employ various deceptive tactics by manipulating system recommendations (e.g. Lee, 2014; Xiao & Benbasat, 2011) and consumer reviews (e.g. Anderson & Simester, 2014; Luca & Zervas, 2016; Mayzlin, Dover, & Chevalier, 2012; Yoo & Gretzel, 2009) for promoting an approach behavior. The consumers generally perceive that e-retailers usually provide OPR due to their vested interest to increase sales or to promote the products rather than in consumers' interest (Cheong & Morrison, 2008). Consequently, this perception hampers consumers' intention to rely on OPR for making buying decision (Benlian et al., 2012), even though they have greater perception on product value (Xiao & Benbasat, 2011).

Nevertheless, no matter how useful OPR is, a critical issue is whether consumers accept and continue OPR use (Sheng et al., 2014). Do consumers continue to use OPR after the initial adoption? This is an important yet neglected issue in existing OPR research (Sheng et al., 2014). It is because that recent prior studies (e.g. Benlian et al., 2012; Lin, 2014; Sheng et al., 2014; Sheng & Zolfagharian, 2014; Xu et al., 2014) investigating OPR adoption are also fairly recent and no research has been done to help understand salient determinants of consumers behavioral intention towards OPR continuous usage. It indicates paucity of literature investigating consumer's OPR continuance intention. Whereas, continuance intention has been considered direct measure of actual continuance behavior and shown a key deterimenant of usage commitment and long-term success of new technologies (e.g. Bhattacherjee, 2001b; Jasperson, Carter, & Zmud, 2005; Rogers, 2010; Thong, Hong, & Tam, 2006). To fill this gap in the literature, the current study develops an integrated research model to investigate the post-adoption factors influencing consumers' OPR continuous usage intention.

In general, the investigation of factors leading to individual usage of IS applications is a perennial research issue (Lee, 2010; Taylor & Todd, 1995; Thong et al., 2006) that continues to receive more attention in the context of OPR (Baum & Spann, 2014; Benlian et al., 2012; Huang et al., 2013; Xu et al., 2014). Although past studies have been conducted to investigate users' intention to initially accept OPR, less attention is paid to the post-adoption stage where they decide to either continue or discontinue OPR use. Therefore, it is early to consider OPR acceptance is successful until its post-adoption is confirmed. The ultimate viability of IS enabled services (e.g. OPR) depends on users' continuous usage intention (Bhattacherjee, 2001b; Karahanna, Straub, & Chervany, 1999; Lee, 2010; Thong et al., 2006). If consumers' enthusiasm diminishes after initial usage of the OPR, then its usage will be reduced and subsequently may cause discontinue OPR usage. When it happens, those e-retailers who have equipped e-commerce sites with product recommender systems would need to write-off their investment in further implementing them and providing OPR. Therefore, consumers' OPR continuous usage decision is much more important for usage commitment and success rate of OPR service.

With regards to the antecedent factors of OPR usage, literature content analysis revealed three streams of OPR researches (see Chapter 2). First research stream (Häubl, Dellaert, Murray, & Trifts, 2004; Häubl & Murray, 2006; Häubl & Trifts, 2000; Hess, Fuller, & Mathew, 2006; Xu et al., 2014) is directed towards understanding the influential factors of consumers' willingness to use or reuse OPR. They demonstrate that decision making effort, decision quality, and satisfaction are directly related to customers' goals in using OPR. For example, Wang and Benbasat (2009) found that user intention to use decision aids is influenced by perceived restrictiveness, perceived cognitive effort and perceived advice quality. Similarly Xu et al. (2014) reported that consumer perception of decision effort and decision quality have impacts on their intention to use OPR. These studies have

used perceived decision effort and perceived decision quality as surrogate measures of OPR performance in terms of usage outcomes.

Since OPR is becoming an important buying decision aid, the primary issue is the degree of benefits from its usage perceived by the consumers. If consumers believe that the OPR usage reduces decision effort and improves buying decision quality, then they may intend to continue OPR usage (Xu et al., 2014). Conversely, if consumers perceive that OPR do not facilitate in decreasing decision effort and increasing decision quality, then they would be more likely to discontinue OPR use and prefer to relay on their own capability rather on OPR. Similarly, several past studies (Bhattacherjee, 2001b; Lee, 2010; Thong et al., 2006; Tsai & Chuang, 2011) also have highlighted that satisfaction is a key determinant of IS continuous usage intention. Satisfaction plays an important role to explain the acceptance–discontinuance anomaly phenomenon that often occurs in the context of IS adoption. If consumers are dissatisfied or their enthusiasm diminished after the initial IS usage, then they may lower their subsequent IS use or may discontinue the IS usage. In the context of OPR, a number of conceptual studies (e.g. Xiao & Benbasat, 2007) and experimental studies (e.g. Häubl & Trifts, 2000; Hostler, Yoon, & Guimaraes, 2005; Wang & Benbasat, 2009; Xu et al., 2014) have also highlighted this notion that customers would be most likely continue OPR use for future shopping, if they are satisfied with the OPR usage due to their expectation-confirmation. In addition to that, Xiao and Benbasat (2007) conducted a conceptual study and stated a number of propositions that perceived decision outcomes and satisfaction may have impact on customers' intention for future OPR use. Implicitly, these factors were used as surrogate measures to OPR performance, because the OPR studies (e.g. Häubl & Murray, 2006; Xiao & Benbasat, 2007; Xu et al., 2014) reported that the decision effort, decision quality, and satisfaction are the premier factors determining the success rate of OPR. Therefore, this study argued

that the absence of these factors could be the main reason for consumers to discontinue OPR use for future purchase. Strengthening these factors could be viewed as a driving measure for the consumers to continue using OPR.

In online buying environment, it is plausible that consumer perception of higher OPR performance emerges due two main reasons. Firstly, lack of personal and one-to-one interaction with e-retailers. Secondly, consumers' inability to touch or experience the product before actual buying which causes uncertainty about the product quality and subsequently hamper buying decision (Benlian et al., 2012). Conversely, it is also plausible that consumers' perception of low OPR performance emerges for several reasons. First, irrelevant or inadequate product recommendations. Second, inconsistency in consumer reviews as opposed to the system recommendations (Baum & Spann, 2014). Third, lack of OPR trustworthiness (Benlian et al., 2012). Fourth, lack of OPR's ability to match or go beyond consumers' expectation. Moreover, Schwind, Stenger, and Aponte (2011) reported that lack of e-fulfilment and lack of trust as the major issues in online environment. The remedies to low OPR performance could be (i) to enhance the OPR' ability in evaluating the products conveniently and in an enjoyable way, (ii) to minimize risk and trust barriers, and (iii) to fulfil consumers' expectations. These OPR evaluation factors might be effective to influence consumers' perception of OPR performance which may also subsequently determine their willingness to continuous usage of OPR.

Referring to the literature, various prior studies (e.g. Baum & Spann, 2014; Benlian et al., 2012; Xiao & Benbasat, 2007; Xu et al., 2014) have shown that the OPR performance can be enhanced by improving OPR evaluation factors. These evaluation factors may be related to various instrumental beliefs (e.g. ease of use, usefulness), social-psychological beliefs (e.g. expectation-confirmation, trust), and affective beliefs (e.g. enjoyment) of the

consumers toward using OPR. In online context, consumers' evaluation factors are considered as positive perception in OPR characteristics, information, and honesty of the recommender systems (Baum & Spann, 2014; Benlian et al., 2012; Kini & Choobineh, 1998). These studies gave a notion that the consumers' positive perception of OPR performance is developed, when they perceive that OPR is easy to use, useful, trustworthy, enjoyable, and fulfil their expectations. For example, Benlian et al. (2012) used perceived ease of use and perceived usefulness as instrumental belief and trusting belief to examine the differential impact of system recommendations and consumer reviews. They found that perceived ease of use, perceived usefulness, and trusting belief play an important role in the evaluation of OPR. Moreover, the technology post-adoption literature (e.g. Lee, 2010; Thong et al., 2006) identified that these instrumental factors play a salient role in determining user satisfaction and intention to continue using the technology. Raghunathan (1999) reported that customers' perception of usefulness in information quality positively influence their decision quality. Seo, Lee, and Lee (2013) also found that perceived usefulness in decision support systems (DSSs) improved users' decision making efficiency and positively contributed to their decision quality. In addition, they argued that less studies have been done in the context of online buying, to examine the direct impact of perceived usefulness on decision effort and decision quality.

Concerning the consumer social-psychological beliefs, various past studies (Komiak & Benbasat, 2006; Wang & Benbasat, 2004; West et al., 1999; Xiao & Benbasat, 2007) have highlighted the importance of considering and managing the customers' expectations in designing OPR. They argued that customers might stop using OPR, when it does not fulfil their various expectations in terms of its performance. Moreover, customers form their trust in OPR performance, when perceived information quality of OPR contributes to the cognitive evaluation of its trustworthiness (Benlian et al., 2012).

Consumers make inferences about OPR's trustworthiness by evaluating the amount and scope of explanatory information provided in the recommendations, or reflecting on how well the recommended products conform to the preference structure they have specified (Benlian et al., 2012). If consumers trust that the OPR is expert, honest, and unbiased in recommending the products that best match their preferences, then it will most likely influence their perception of decision effort, decision quality, and satisfaction with OPR. Although various IS studies (e.g. Fang et al., 2014; Kim, Ferrin, & Rao, 2009; Nica, 2015) have explored the relationship between customers' social-psychological beliefs and satisfaction, literature reviews revealed that no empirical study has yet paid attention in investigating the impact of social-psychological beliefs (perceived confirmation and trust) on OPR performance in terms of perceived decision effort, perceived decision quality and satisfaction. However, based on the above discussion, it is asserted that consumers' positive and negative perception of OPR evaluation factors positively and negatively affect the OPR performance respectively. Therefore, this study includes five OPR evaluation factors related to consumers' instrumental beliefs (i.e. ease of use and usefulness), social-psychological beliefs (i.e. confirmation and trust), and affective belief (i.e. enjoyment), and investigate their impact on OPR performance.

Moreover, content analysis showed that most of the past studies (Duan et al., 2008; Lin, 2014; Liu, 2006; Mudambi & Schuff, 2010; Oestreicher-Singer & Sundararajan, 2012; Pathak, Garfinkel, Gopal, Venkatesan, & Yin, 2010) have investigated the OPR performance by examining the impact of OPR use on helpfulness and purchase intention. Other studies (Benlian et al., 2012; Jiang, Shang, & Liu, 2010; Komiak & Benbasat, 2006; Kumar & Benbasat, 2006; Qiu & Benbasat, 2009; Xiao & Benbasat, 2007; Xu et al., 2014) also have examined the impact of OPR use on various customers' evaluation beliefs. Although the findings of these studies are important, the e-commerce literature

has placed less attention on the post-adoption stage where the consumers decide either to continue or discontinue OPR use. Additionally, many past researchers have long argued the criticality of continued use of IS-enabled services (e.g. Bhattacherjee, 2001b; Jasperson et al., 2005; Kim & Malhotra, 2005). For example, Bhattacherjee (2001b, p.351) argued that "*long-term viability of an IS and its eventual success depend on its continued use rather than first-time use"*. However, a significant number of consumers should have to move beyond the initial acceptance stage and use OPR on a continuous basis. It further becomes more critical, when consumers have the freedom of choice whether they keep buying from the website or cease the use of the website for future purchase at any time and from any location (Sheng et al., 2014). Therefore, consumers' continuous usage of OPR at an individual level has become essential to the survival of many e-retailers.

Furthermore, literature content analysis also revealed that 69% of OPR studies have experimentally investigated the pre-usage and initial usage of OPR. These studies have neglected the "real-world" consumer environment in favour of controlled and overly-structured laboratory experiments, and were thus unable to explore how decision makers actually obtain information and use in decision making process (Zha, Li, & Yan, 2013). It shows that there is lack of literature focussing on real consumer environment and OPR continuous usage intention. By drawing upon various research disciplines, this study focuses on real consumer environment and new theoretical perspectives which would expand both customers' and retailers' understanding on the antecedent factors of OPR continuous usage intention. Therefore, this study attempts to develop an integrated research model by incorporating variables from IS continuance model (Bhattacherjee, 2001b; Thong et al., 2006), theory of trust formation (Benbasat & Wang, 2005; Gefen,

Karahanna, & Straub, 2003; Kim, Ferrin, & Rao, 2008; Komiak & Benbasat, 2006), flow theory (Koufaris, 2002) and effort-accuracy model (Payne et al., 1993).

The following sections detail out the scope of the study.

1.3. Scope of the Study

The scope of this study is limited to Amazon customers who rely on OPR for facilitating their online buying decision. Amazon is an American e-commerce and cloud computing company with headquarters in Seattle, Washington. It is the largest Internet-based retailer in the United States (Barney, 2011) and has separate fourteen (14) retail websites for United States, United Kingdom and Ireland, France, Canada, Germany, Italy, Spain, Netherlands, Australia, Brazil, Japan, China, India and Mexico. Amazon customers were chosen as target population due to following three reasons. Firstly, a verified list of Amazon customers is available on Amazon website. Secondly, Amazon customers are likely to demonstrate strong online buying power. Thirdly, they are exposed to OPR while making online purchases. Additionally, Amazon is recognized as one of the leading e-commerce retailers and is a good example for other online shopping stores in terms of the way it facilitates the provision of OPR (Archak, Ghose, & Ipeirotis, 2011; Benlian et al., 2012).

Since the availability of many types of products with varying qualities and prices are increasing tremendously, it also burdens the customers' decision making effort for selecting products that best match their needs. In order to assist them to reduce their decision effort and improve buying decision quality, Amazon website is equipped with product recommender system that recommends a list of products to a particular customer, based on various content or collaborative filtering techniques (Benlian et al., 2012; Lin,

2014). In addition to that, the OPR also contain consumer reviews along with recommended products, perhaps with the purpose of providing more related information to improve consumers' buying decision or enhance the performance of product recommendations (Benlian et al., 2012; Kumar & Benbasat, 2006; Lin, 2014). The OPR assist customers in increasing their level of certainty regarding quality of products (Benlian et al., 2012; Mudambi & Schuff, 2010). This is because of online customers' inability to experience the product before actual consumption, which may hampers their purchase decision. However, the OPR is not only useful for the consumers, it also substantially reduces e-retailers' operating costs in order to gain market share or make loyal customers.

Content analysis revealed that existing researches focus on three aspects of OPR: (1) impact of OPR characteristics, (2) effect of OPR usage, and (3) influencing factors of consumers' intention to accept OPR and purchase intention. First stream of OPR researches investigated how different characteristics (quality, valence, volume, credibility, framing, trade-off transparency, & presentation) of OPR influence consumers' evaluation beliefs and behavioral intention to use or reuse OPR. For example, Filieri and McLeay (2014) investigated the impact of information characteristics (accuracy, value-added, relevance, and timeliness) on the adoption of information from online recommendations. Some scholars focus on information quality and argument trustworthiness (Cheung, Lee, & Rabjohn, 2008), valence of online recommendation (Park & Lee, 2009b), and perceived quality of OPR (Luo et al., 2015). Other scholars focus on trade-off transparency characteristics of recommender system (Xu et al., 2014), vividness (text, voice, and animation) characteristics of OPR (Hess, Fuller, & Campbell, 2009), and humanoid embodiment and human voice-based communication features of OPR (Qiu & Benbasat, 2009). Second stream of OPR researches have focused on

investigating the impact of OPR usage on consumers' decision-making variables to show that consumers benefited through reduced information overload, reduced search efforts, and improved decision quality (Häubl & Murray, 2003; Häubl & Trifts, 2000; Hennig-Thurau, Marchand, & Marx, 2012; Lee & Benbasat, 2011; Su, Comer, & Lee, 2008; Todd & Benbasat, 2000; Xu et al., 2014). For example, Häubl and Trifts (2000) focus on the effect of OPR use on consumers' search efforts and decision quality. Dabholkar and Sheng (2012b) found that greater consumer participation in using OPR leads to more satisfaction, greater trust, and higher purchase intention. Third stream of OPR research directed towards understanding the influencing factors of consumers intention to accept OPR and purchase intention. For example, Sheng and Zolfagharian (2014) integrated consumer's participation construct into technology acceptance model (TAM) to show that perceived ease of use, perceived usefulness, and perceived enjoyment have significant impact on consumer' intention to use OPR. Benbasat and Wang (2005) incorporated trust in TAM to show that consumers' acceptance of OPR is significantly influenced by perceived ease of use, perceived usefulness, and trusting belief. Komiak and Benbasat (2006) investigated how perceived personalization and familiarity impact consumers' intention to accept OPR by analyzing underlying mechanisms of cognitive and emotional trust. Wang and Doong (2010) demonstrated that perceived argument quality and source credibility of OPR significantly influenced consumers' intention to purchase recommended product.

As discussed earlier, prior studies investigated various aspects of OPR. Majority of these studies have experimentally tested the pre-usage and initial usage of OPR. It indicates that they have neglected the "real-world phenomena" (i.e. customer environment) due to controlled and overly structured laboratory experiments, and were thus unable to explore how decision makers actually obtain information and use it in decisions making process

(Zha, Li, & Yan, 2013). However, due to the lack of OPR continuous usage phenomenon in real consumer environment, this study is interested in examining the consumers' behavioural response towards OPRs continuous usage. This study investigates the behavioural response by examining consumers' OPR continuous usage intention and the factors that influence it from the perspective of Amazon customers. Additionally, this study is concerned to highlight OPR performance in terms of its usage outcomes that determine consumers' OPRs continuous usage intention. This study also examines the relationship between consumers' OPRs evaluation beliefs and OPRs performance.

1.4. Research Questions and Objectives

The primary objective of this research is to identify salient determinants of OPR continuous usage intention and to understand how they influence the dependent variable. More specifically, how do consumers' instrumental, social-psychological, and affective beliefs of OPR evaluation influence OPR performance which subsequently determine their OPR continuous usage intention? In align with the main research objective and research question, the following two research questions (RQs) are posed:

RQ1: How does consumers' perceived OPR performance influence their OPR continuous usage intention?

RQ2: What are the most salient instrumental, social-psychological, and affective beliefs of OPR evaluation that influence consumers' perception of OPR performance?

In consonance with the above research questions, the following two research objectives (ROs) are specified:

RO1: To examine how consumers' perceived OPR performance (i.e. decision effort, decision quality, and satisfaction) on their OPR continuous usage intention.

RO2: To investigate the role of instrumental (i.e. ease of use and usefulness), social-psychological (i.e. confirmation and trusting beliefs), and affective (i.e. enjoyment) beliefs of OPR evaluation in influencing consumers' perceived OPR performance.

In align with these research questions, the proposed research model aims to investigate consumers' behavioural response by examining their OPR continuous usage intention based on IS continuance model (Bhattacherjee, 2001b). Continuous usage intention is a recommended measure of users' behavioural response toward IS continuous usage in voluntary environment. Consumers' OPR continuous usage intention is proposed to be influenced by OPR performance which represents consumers' OPR usage outcomes based on effort-accuracy model (Payne et al., 1993) and IS continuance model. In addition to that, consumers' OPR evaluation beliefs are believed to influence perceived OPR performance based on IS continuance model, theories of trust formation (Benbasat & Wang, 2005; Gefen et al., 2003; Kim et al., 2008; Komiak & Benbasat, 2006), and flow theory (Koufaris, 2002). Figure 1.2 illustrates the research issues under investigation.

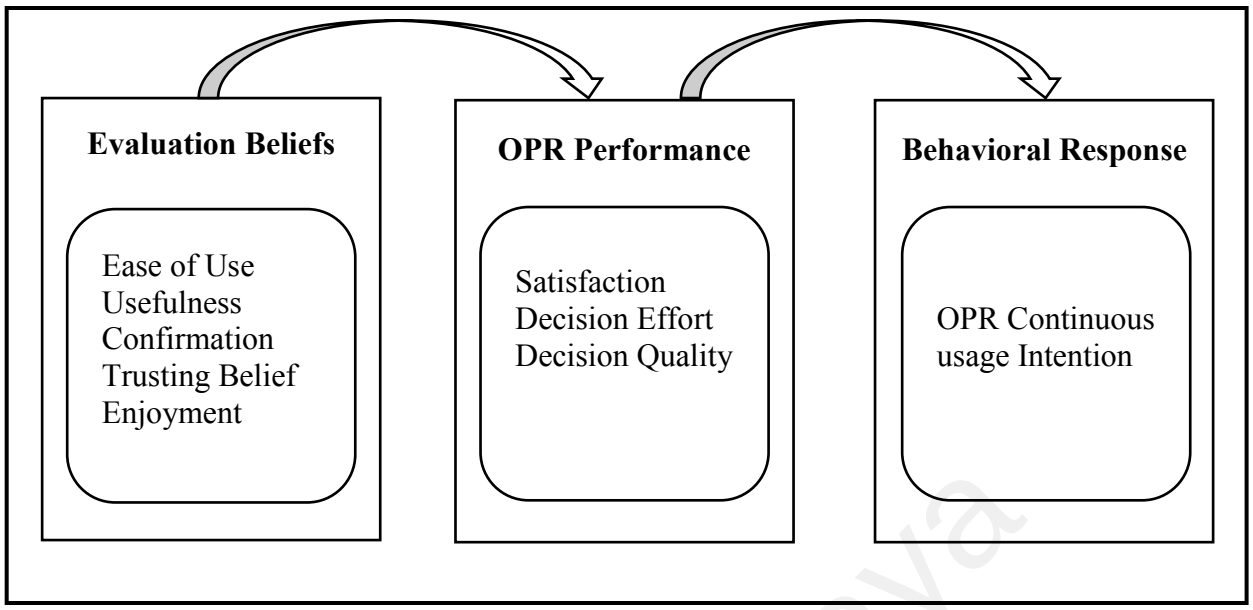


Figure 1.4: Research Issues

The first issue identifies the consumers various beliefs related to OPR evaluation. Based on the content analysis, five frequently used factors related to OPR evaluation are identified. These Five OPRs evaluation beliefs are as follows: perceived ease of use, perceived usefulness, perceived confirmation, trusting beliefs, and perceived enjoyment. In the past IS literature, the first two factors; ease of use and usefulness, have been used as instrumental factors of system evaluation (e.g. Bhattacherjee, 2001b; Lee, 2010; Thong et al., 2006), whereas the other two factors; confirmation and trusting beliefs are considered as social-psychological factors (e.g. Bhattacherjee, 2001b; Gefen et al., 2003; Robinson, 1996; Sztompka, 1999), and the last factor; perceived enjoyment represents the affective factor. Past IS studies (Cyr, Head, & Ivanov, 2009; Kamis, Koufaris, & Stern, 2008; Koufaris, 2002; Sun & Zhang, 2008; Van der Heijden, 2004; Xu, Benbasat, & Cenfetelli, 2013) have shown that perceived enjoyment is an important component to capture users' affective feelings. Thus, this study uses five OPR evaluation factors related to three categories of consumers' beliefs: instrumental, social-psychological, and affective beliefs.

The second issue identifies the factors related to OPR performance. Based on the literature content analysis, three factors are identified in terms of consumers' OPR usage outcomes. These three factors are perceived decision effort, perceived decision quality, and satisfaction. Several past studies (Häubl & Murray, 2006; Häubl & Trifts, 2000; Xiao & Benbasat, 2007; Xu et al., 2014) reported that these factors are directly influenced by OPR usage. These studies indicated that decision effort and decision quality are the main decision outcomes while using a decision aid (i.e. OPR). In addition, several other IS studies (e.g. Gatian, 1994; Gelderman, 1998; Griffiths, Johnson, & Hartley, 2007; Sharabati, 2014) have shown that end-user satisfaction is a recommended or a valid measure for system performance. Consequently, this study uses decision effort, decision quality, and customer satisfaction as surrogate measures to OPR performance.

The third concern is to examine the link between OPR performance and OPR continuous usage intention. The decision effort, decision quality, and satisfaction are seen the key factors that may influence the consumers' behavioural response toward OPR continuous usage. Past studies (Bhattacherjee, 2001b; Jacoby, 2002; Xu et al., 2014) stated that the individual's behavioural intention represents their behavioural response. Therefore, the aim of this study is to investigate whether or not perceived OPR performance affects consumers' OPR continuous usage intention.

The fourth concern examines the links between five OPR evaluation beliefs and OPR performance. A few experimental studies have examined the relationships between various OPR evaluation factors and OPR performance factors. For example, Xu et al. (2014) investigated the impact of perceived product diagnosticity and perceived enjoyment on perceived decision effort and perceived decision quality. They found that perceived enjoyment significantly influences the decision effort and decision quality,

whereas perceived product diagnosticity had significant impact on decision quality only. Thus, the aim of this study is to examine the role of OPR evaluation factors in determining perceived OPR performance.

1.5. Main Theoretical Underpinnings of the Study

In order to develop a research model which can provide a strong theoretical foundation for investigating and answering the research questions, the study needs well-established theoretical models to explain the causal relationships in the research model. With reference to literature reviews, a theoretical foundation of the proposed research model is derived from four main theoretical frameworks: (1) IS continuance model (Bhattacherjee, 2001b; Thong et al., 2006), (2) effort-accuracy model (Payne et al., 1993), theory of trust formation (Benbasat & Wang, 2005; Gefen et al., 2003; Kim et al., 2008; Komiak & Benbasat, 2006), and flow theory (Koufaris, 2002).

Based on these theoretical underpinnings, a research model is developed consisting consumers' evaluation beliefs, OPR performance, and continuous usage intention. Evaluation beliefs are consisting of five factors: perceived ease of use, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment. The first three factors are from IS continuance model (Thong et al., 2006), remaining two factors are from trust formation theory and flow theory, respectively. Whereas, OPR performance consisted of three factors: decision effort, decision quality, and satisfaction. The first two decision-related factors are from effort-accuracy model and satisfaction is from IS continuous usage.

1.6. Significance and Motivation of the Study

Addressing the proposed research gaps is conceptually important and useful. This study provides fine-grained knowledge about the different mechanisms affecting OPR continuous usage, by developing a more holistic and integrative understanding regarding the impact of OPR use which has been overlooked in the past related literatures (e.g. Baum & Spann, 2014; Benlian et al., 2012; Huang et al., 2013; Lin, 2014; Xu et al., 2014). The significance of conducting this research is to evaluate the success of OPR by highlighting the determinants that influence the consumers' intention to continue using OPR. By exploring the past literature, only a few studies concerned about simultaneously investigating the OPR evaluation factors that affect OPR performance and consumers' intention to reuse OPRs. To improve our understanding regarding the factors influencing consumers' OPR continuous usage intention, this research evaluates the performance and success of OPR from Amazon customer's perspective. In addition to that, this study is significant for several reasons as follow:

First, recommender systems are increasingly available to consumers as a value-added service technology (Sheng et al., 2014), which requires good administration for fulfilling the objectives of online customers and e-retailers (Xiao & Benbasat, 2007). Sheng et al. (2014) stated that no matter, how useful they are, a critical issue in it is whether consumers accept product recommendations and continue to use after initial acceptance. Therefore, this study investigates the factors that determine the consumers' continued use intention.

Second, several past studies reported that OPR consisted of concise set of recommended products in accordance to the consumers' preferences, which minimize information overload and search effort in choosing products that meets their desire. Moreover, the

claim of benefits provided by OPR in terms of reduced decision effort and improve buying decision quality, are the driving force of consumers to continue using the similar types of recommendations for their future buying. Additionally, consumers have the freedom to continue or stop using them. Taking the real consumer environment into account, it is essential to investigate the factors that determine the OPR performance, which subsequently influence the consumers' intention to continue using OPR.

Third, since the OPR users are online customers, who are important for the profitability of companies, the major objective of e-retailers for providing OPR is to retain the existing customer as well as to increase their market share. It is equally important for the e-retailers to be well-prepared in implementing the recommender system which offers suitable services to customers. Therefore, the investigation of the factors that enhance OPR performance from customers' perspective is important for e-retailers to design effective OPR by emphasizing the OPR along customers' purchasing funnel (Riesenbeck & Perrey, 2009). The purchase funnel refers to the customer-product interaction process into four successive steps such as awareness, consideration, purchase intention, and loyalty (Benlian et al., 2012).

Fourth, since a few studies identified the factors related to OPR evaluation, it could be beneficial to understand more about the evaluation factors and their relationship with OPR performance. In literature, little consideration is shown towards the relationship between OPR evaluation factors and OPR performance, and subsequently towards OPR continuous usage intention. The initial adoption and usage of OPRs has been prevalent in OPR literature, there is little research examining the critical role of OPR evaluation factors and OPR performance in the context of OPR continuous usage (Sheng et al., 2014). Therefore, this study investigates the factors based on theoretical underpinnings in

predicting and explaining consumers' perception of OPR performance and also based on an empirical evaluation of the OPR performance-related factors affecting consumers' behavioural intention to continue using similar type of OPR for future purchase. Hence, the findings help to bridge the existing gaps in the OPR literature.

Fifth, the study attempts to develop a research model which is applicable to different kinds of innovation that also has consumer appeal. The findings are expected to provide empirical validation for the utility of the research model and also help us to better understand the consumers' behavioural response towards OPR continuous usage.

Sixth, at a more practical level, this study also provides practitioners with insights into how to address customers' continued usage behaviour and serves as a guideline to employ OPR mechanisms in a more appropriate way.

Finally, it provides practical implications to e-retailers for recommendation-based product marketing strategies and designing sales-efficient e-commerce websites that enhance online customers' overall shopping experience.

1.7. Organization of the Study

This study consists of six (6) chapters. The current ***chapter 1*** is about the introduction, research problem statement, study scope, research questions and objectives, main theoretical underpinnings, and significance of the study. In end, the chapter summary is presented.

Chapter 2 starts with describing and explaining the OPR in the context of this study. Then, the next section presents content analysis of the previous related studies based on systematic literature review. Following section presents the analysis of the past literature over three stage adoption process and highlights the research gaps existing in the literature. Then, the chapter synthesizes the post-adoption researches in terms of the antecedent factors pertaining to satisfaction and IS continuous usage intention. After that, the chapter presents the factors used to measure consumers' OPR evaluation beliefs and OPR performance. Finally, the chapter provides theoretical foundation with respect to four theoretical models used in this study for developing research model and underlying hypotheses. In the end, summary of the chapter is provided.

Chapter 3 articulates and develops the research model and subsequently six hypotheses are posed to validate and confirm the research model.

Chapter 4 covers the appropriate research methodology for this study by discussing research paradigm, research approach, and research design. This chapter presents the research instrument development and its validation process by discussing the steps of developing the measurements, and way it is used to validate them by conducting expert panel, pretesting the questionnaire, and pilot study. After that, it provides research sample determinations by specifying the targeted population, unit of analysis, sampling frame, sampling method, and appropriate sample size. In addition to that, the chapter explains the questionnaire design and the way various sections are presented to respondents. It also explains the way the questionnaire is distributed and collected from Amazon customers through online survey. Additionally, it highlights the justification for conducting an online survey. Finally, the chapter discusses the data analysis techniques, software used

for analysis, and specifies the criteria for analysing the measurement model and structural model in this study.

Chapter 5 explains the way the data collected is used to analyse the research model. This chapter is divided into five sections; (1) data preparation process, (2) analysis of multivariate assumption, (3) assessment of measurement model, (4) analysis of proposed research model, and (5) analysis of structural model. Data preparation process includes data coding, data cleaning, missing data handling, monotone response pattern analysis, demographic analysis, assessment of non-response bias, exploratory factor analysis (EFA), and examination of outliers. Analysis of multivariate assumptions is analysed by introducing the test of normality, test of multi-collinearity, and common method bias. Further analysis is conducted by using Partial Least Square Structural Equation Modelling (PLS-SEM). PLS-SEM is used to examine reflective measure reliability and validity as well as formative measure validity in addition to confirmatory factor analysis (CFA). Then, the proposed research model is analysed using PLS-SEM by proposing and examining alternative models. In the end, the final structural model is used to test the hypotheses. Furthermore, this sections also presents the comparison between full model, theoretical model, and control model, following which the results are ready for interpretation and discussion.

Chapter 6 presents the main findings of this study by providing discussion on the results. The results are also compared with the past findings. Then, the chapter presents implications by highlighting theoretical and practical contributions of the study. The chapter ends with discussion of study limitations and future research recommendations in align with research findings. The road map of this study is shown in Figure 1.3.

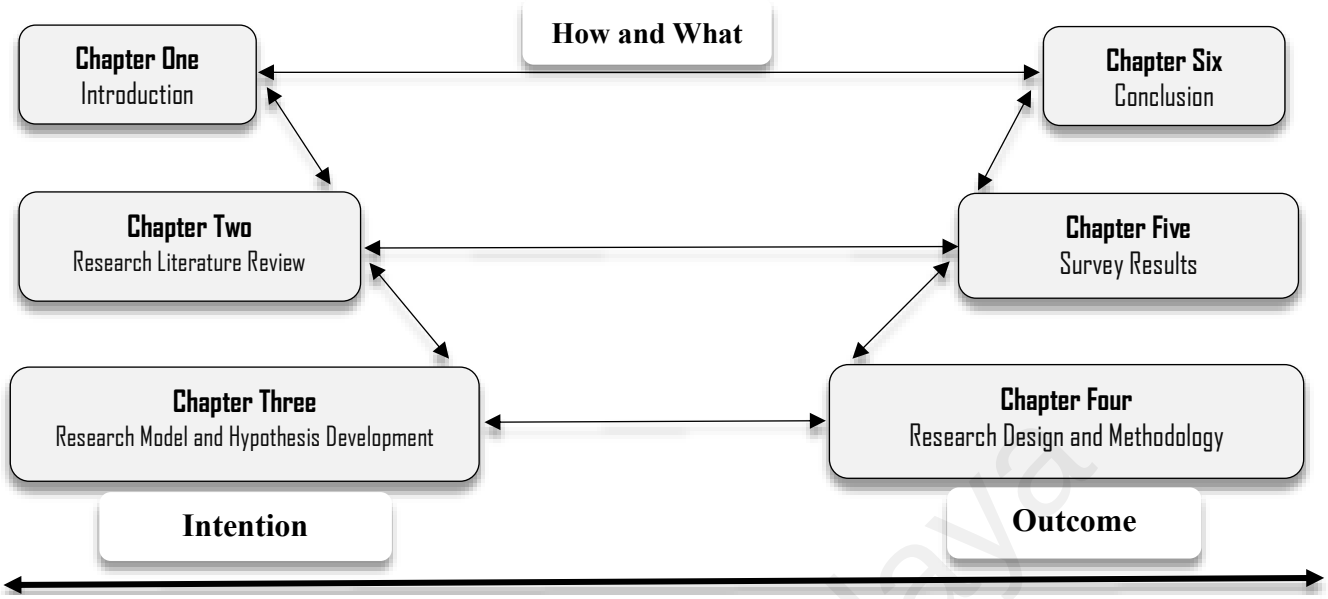


Figure 1.3: Road Map of the Study

1.8. Summary

This chapter presented a detailed description about the background of the study, research problem, and scope of the study. Then, research questions and objectives are presented. Additionally, main theoretical underpinnings are discussed. Subsequently, significance and motivation of the study are explained. Finally, the organization of the study is outlined with a brief description of each chapter. The following chapter (Chapter 2) reviews the existing literature in order to develop a clear understanding regarding antecedents of OPR continuous usage intention and underlying theoretical lens applied in this study.

CHAPTER 2

LITERATURE REVIEW

2. Introduction

This chapter is divided into five sections. The first section presents the research on online product recommendation (OPR) and it further consists of five subsections. These subsections present the content analysis of past researches on the study context of OPR, the factors influencing OPR performance, discussion on the inter-relationship among these factors, and subsequently presents the analysis of the past literature over three stage adoption process by highlighting the research gap in the literature. The second section synthesizes the post-adoption researches in terms of antecedent factors pertaining to satisfaction and IS continuous usage intention. The third section presents the factors measuring consumers' OPR evaluation beliefs and OPR performance. The fourth section provide discussion on most frequently used theories and models in the literature. Finally, a brief summary of the summary is provided in the end.

2.1. Online Product Recommendation (OPR)

Past studies (Benlian et al., 2012; Senecal & Nantel, 2004) categorized the information sources into four groups. First, personal sources providing personalized information (e.g. my brother says that this product or service is best for me). Second, personal sources providing non-personalized information (e.g. consumers share their experiences about their product or service usage in terms of consumer reviews). Third, impersonal sources providing personalized information (e.g. product recommender system recommends this product or service based on my requirement or profile, or the profile of likeminded

person). Fourth, impersonal sources providing non-personalized information (e.g. based on different consumer reports, this product or service is the best in the market). Although different types of product recommendation rely on the above mentioned four sources of information available on e-commerce platform (Benlian et al., 2012), this study focuses on the second and third types of information sources: personal sources providing non-personalized information (e.g. consumers reviews) and impersonal sources providing personalized information (e.g. system generated recommendations). Both of these information sources are extensively deployed on e-commerce platforms in order to assist customers in reducing their uncertainty about quality of product and selecting suitable products (Benlian et al., 2012). However, these two types of recommendation sources are discussed separately in the following subsections.

2.1.1. Product Recommender Systems

Product recommender systems provide product related information to facilitate online customers in deciding which product to purchase or not (Xiao & Benbasat, 2007). These recommender systems are Internet-based software that accomplish or execute a set of operations on behalf of customers, and providing shopping advice on the basis of their past buying behaviour or their specified preferences, or the preferences of other like-minded customers in their affinity group (Benlian et al., 2012; Xiao & Benbasat, 2007; Xu et al., 2014). They recommend products which are listed under the title "Customers who bought this item also bought" or "Customers who bought these products, you can also think about them" (Lin, 2014). Moreover, product recommendations are also sent directly to the customers via their email addresses.

In order to enhance website sales efficiency, different types of recommender systems have been designed based on different filtering techniques (Benlian et al., 2012; Xu et al., 2014). There are two important and widely used filtering techniques: content-based filtering and collaborative-based filtering (Wei et al., 2005). Content-based filtering refers to a technique based on a set of algorithms which drive recommendations for a particular customer based on his/her profile or past buying behavior (Ansari et al., 2000). For instance, a content-based filtering recommender system recommends products to customers based on their expressed preferences for a product in their e-commerce profile or based on customers' past purchasing history. In contrast to content-based filtering, collaborating-based filtering recommendations resembles the word of mouth recommendations and track the behavior of like-minded customers to drive recommendations for a particular customer (Ariely et al., 2004; Benlian et al., 2012). These recommendations are originated based on statistical analysis of patterns drawn from data of product ratings explicitly given by other customers or implicitly tracking the shopping behavior of other customers through recommender system (Montaner et al., 2003). For instance, a collaborating-based recommender system recommends a list of products to customers due to other like-minded customers have bought the products or strongly recommended. These like-minded customers refers to a group of customers who share similar preferences (Benlian et al., 2012). The collaborative-based system contains brief description of a product and the provision of key product attributes (e.g. price, screen size, hard drive size, RAM, processor of a laptop). In addition to the objective information, recommender systems also provide subjective information (i.e. consumer reviews) regarding the product attributes. Consumers reviews are incorporated in the system generated recommendations, perhaps with the purpose of providing more related information in order to improve customers' buying decision or to enhance the

effectiveness of system generated recommendations (Benlian et al., 2012; Kumar & Benbasat, 2006; Lin, 2014).

2.1.2. Consumer Reviews

Consumer reviews are the feedbacks of the past consumers, who share their post-consumption experiences to advice potential customers of the products (Benlian et al., 2012; Mudambi & Schuff, 2010). The consumer feedback consists of following three important factors: (1) product ratings, (2) textual explanation, and (3) helpful votes (Benlian et al., 2012; Lin, 2014; Mudambi & Schuff, 2010). Product rating refers to overall assessment of the product quality based on five star ratings. It provides critical information to potential customers for facilitating their purchasing decision and driving more traffic to the e-commerce platform. Along with the product rating, consumers also provide textual evaluation of product quality based on their personal experience with the product usage. They explain different features of the products based on the actual functionality. In the end, they usually recommend the current product or an alternate product of better quality (Benlian et al., 2012; Mudambi & Schuff, 2010). These consumer-generated feedback help potential customers to increase their level of certainty regarding the quality of products (Benlian et al., 2012; Mudambi & Schuff, 2010). Later, when a potential customer visit any of these customer reviews in order to evaluate a particular product, they also could vote on the reviews' helpfulness based on the level of product diagnosticity. The most helpful reviews are usually displayed on the top along with product presentation (Benlian et al., 2012; Huang et al., 2013; Lin, 2014). The e-retailers also provide platform for their customers to share the post-consumption experiences in textual form. For example, Amazon is the first to provide such platform where consumers can post their reviews on product functionality (Lin, 2014), and

potential customers can also consult these reviews for making shopping decisions (Mudambi & Schuff, 2010).

Local consumer review survey reported that 85% of customers consult consumer reviews before choosing a final product and 65% claim that consumer reviews impact their purchase decision (Bright Local 2013). It indicates that consumer reviews are considered as an important source of information and product recommendations (Benlian et al., 2012; Duan et al., 2008; Huang et al., 2013) which influence customer's decision making and organizational performance (Zhu & Zhang, 2010). Therefore, consumers reviews has become a necessary and an important source to seek product-related information which influences the way customers support their purchase decision process. Consumer reviews are considered useful in helping potential customers in their purchase decision, because it offers indirect experiences of products (Park & Lee, 2009b), greater credibility and relevance than seller-oriented information (Bickart & Schindler, 2001), because customers usually have doubt about the information provided by e-retailers which may hinder their purchase decision (Benlian et al., 2012). Due to that, customers require extra and more detailed product-related information from other credible information sources (e.g. consumers reviews) to increase certainty about the product quality (Benlian et al., 2012).

Due to the significance and popularity of consumer reviews, system generated information and consumer reviews are integrated and named online product recommendations (OPRs) (Benlian et al., 2012). Consequently, OPR consist of both objective and subjective information for facilitating customers' buying decision or improving customers' ability to make effective buying decision. Therefore, OPRs are becoming increasingly available on e-commerce sites and are also gaining popularity

among online customers due to the benefits of reduced information overload and improved decision quality (Park & Lee, 2009b). Several past studies (Benlian et al., 2012; Cheung et al., 2009; Huang, 2014; Huang et al., 2013; Xiao & Benbasat, 2007; Xu et al., 2014; Zhu & Zhang, 2010) also highlighted that OPR can influence the customers' beliefs, attitude, and behavioral response in online buying decision process. These studies indicate that academicians and practitioners have been taking interest to investigate the role of OPR in e-commerce transactions. The following section presents content analysis of the past researches conducted to examine various aspects of OPR.

2.2. Content Analysis of the Past OPR Literature

To persuade consumers to adopt services/products in an online environment, online service providers and third party websites provide online recommendations (Benlian et al., 2010, 2012; Xiao & Benbasat, 2007). OPRs are "becoming increasingly available on websites to provide consumers with shopping assistance and improve their decision quality, as well as to help buyers and sellers to reduce information overload" (Benlian et al., 2012, p. 238). Additionally, they play important role in the popularity and success of e-commerce (Benlian et al., 2012). In recognition of the significance of OPRs, the investigation of factors leading to individuals' OPR usage is a perennial research issue that continues to receive increased attention. In order to identify the factors pertaining to the effectiveness of OPRs and consumers' response towards adopting them, the researcher adopted the "Five Steps Grounded Theory Literature Review Method" (Wolfswinkel, Furtmueller, & Wilderom, 2013), to systematically review prior OPR literature published from 2000 to 2015. The five steps method assisted to conduct a thorough theoretical analysis of the OPR literature. A detailed description of the method is provided in Appendix-B, and review output as conceptual model is presented in the

following section of this chapter. In addition to that, a content analysis was performed in order to identify the type, subjects, and other aspects of OPR research. For content analysis, the articles published in journals and conferences on the area of online recommendations were reviewed.

The search for articles was performed in a number of electronic databases such as Science Direct, Web of Sciences, Emerald, JSTOR, EBSCOhost, ABI/INFORM @ Proquest, Springer Link, ACM, AIS e-library, and Google Scholar. Key words such as "online product recommendation", "online recommendation", "product recommendation", system recommendation", "system generated product recommendation", 'user generated recommendations", "online consumer reviews", "electronic word of mouth", "eWOM", and "eWOM recommendation" were used to search relevant articles. In order increase the coverage of relevant articles, several combinations of the key words were also used. For example;

- System recommendation and online customer reviews
- Product/service recommendation and consumer reviews
- Product/service recommendation and electronic word of mouth
- Recommendations and eWOM

To ensure that no major relevant article is ignored, the researcher also searched leading scholarly Information Systems journals (i.e. MIS Quarterly, Journal of Management Information Systems, Decision Support System, Information Systems Research, European Journal of Information Systems, Computer in Human Behavior, International Journal of Electronic Commerce, Information Systems Journal, Journal of Association for Information Systems, and Information & Management), and a few other major

Marketing journals (Journal of Marketing, Journal of Marketing Research, Journal of Interactive Marketing, and Journal of Consumer Research). Furthermore, backword and forward searches were also performed in searching articles.

The article search initially yielded 391 articles. All 391 articles were not appropriate for inclusion in the content analysis. According to Wolfswinkel et al. (2013), researchers specify the scope of their review by establishing inclusion criteria. To this end, only peer-reviewed studies in which (1) online product/service recommendation was the main focus of the research, and (2) the study was empirical or entirely conceptual (Note. Later on, entirely conceptual or theoretical studies were excluded for further analysis of factors pertaining to OPR usage). Applying these criteria to 391 articles resulted in 179 articles that were used in preliminary content analysis. Table 2.1 shows various area of the articles that were used for content analysis.

Table 2.1: Content Analysis Area

No.	Area
1	Article title
2	Journal
3	Year
4	Origin of the study
5	Unit of analysis
6	Theory/model used in the study
7	Research method
8	Data analysis technique
9	Research type
10	Independent Variable(s)
11	Mediating/moderating variable(s)
12	Dependent variable(s)
13	Main research findings

The result of content analysis indicated that out of 179 articles, 28 (16%) articles were published during the year 2013, followed by 23 (13%) published during 2012, followed by equal of 22 (12%) articles published in 2011 and 2010, followed by 15 (8%) articles published in 2014, 14 (8%) articles published in 2008, 13 (7%) articles published in 2009,

9 articles published in 2006, equal of 7 articles published in 2007 and 2003, followed by 6 articles published in 2004, 5 articles published in 2001, 4 articles published in 2005, 3 articles published in 2015, and 1 article published in 2000. Figure 2.1 shows the number of articles published in each year from 2000 to 2015, except 2002.

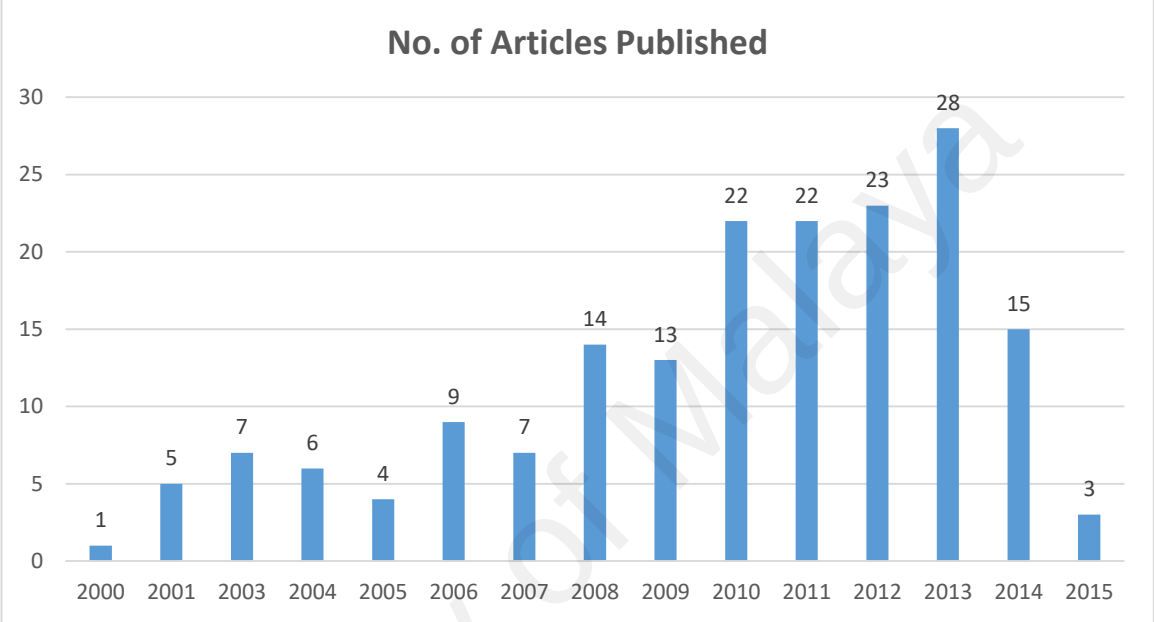


Figure 2.2: Number of Articles Published

The articles analysed were published in various top-tier journals. Most of the articles are published in Journal of Management Information Systems (13), International Journal of Electronic Commerce (10), Decision Support Systems (7), Journal of Marketing (7), MIS Quarterly (6), Journal of Interactive Marketing (6), Computers in Human Behavior (6), IEEE Transactions On Knowledge and Data Engineering (5), Journal of Business Research (5), Internet Research (5), European Conference on Information Systems (4), Hawaii International Conference on System Sciences (4), Journal Of Consumer Psychology (4), ACM conference on Recommender system, Journal of Association for Information System (3), Americas Conference on Information Systems (3), and Journal of the association for Information Systems (3). Many other journal like European Journal of Marketing, Journal of Marketing Research, Information & Management, and Journal

of Retailing have also published articles on OPR. Apart from the above journals and conferences, some others had one article each on OPR. Table 2.2 shows the list of journals and the number of articles published in each journal.

Table 2.2: Journals and Articles Published

No.	Journal	No. of articles
1	Journal of Management Information Systems	13
2	International Journal of Electronic Commerce	10
3	Decision Support Systems/Journal of Marketing	Each 7
4	MIS Quarterly/Journal of Interactive Marketing/Computers in Human Behavior	Each 6
5	IEEE Transactions On Knowledge And Data Engineering/Journal of Business Research/Internet Research	Each 5
6	European Conference on Information Systems/Hawaii International Conference on System Sciences/Journal Of Consumer Psychology	Each 4
7	ACM conference on Recommender system/Electronic Commerce/Research and Applications/ /Journal of Association for Information System/Americas Conference on Information Systems/Journal of the association for Information Systems	Each 3
8	International Conference on Wirtschaftsinformatik/Information Systems Research/Pacific Asia Conference on Information Systems/Online Information Review/User Modeling and User-Adapted Interaction/Journal of Retailing/Journal of Consumer Behaviour/Information & Management/Journal of Marketing Management/International Conference on Information Systems/Tourism Management/Journal of Interactive Advertising/International Journal of Electronic Business Management/International World Wide Web Conference Committee	Each 2
9	European Journal of Marketing/Journal of Marketing Research/International Multi-Conference of Engineers and Computer Scientists/Global Conference on Business and Finance Proceedings/ Conference Proceedings of American Marketing Association/Bled eConference eTrust: Implications for the Individual/Enterprises and Society/Journal of Current Issues and Research in Advertising/Journal of Computer-Mediated Communication/Journal of Business Ethics/ International Journal of Computer, Electrical, Automation, Control and Information Engineering/ Journal of Theoretical and Applied Electronic Commerce Research/Journal of Travel Research Association for Consumer Research/International Conference on Web Information Systems and Technologies/Journal of Applied Social Psychology/International Conference on Electronics and Information Engineering/Cyberpsychology & Behavior/Journal of Database Marketing & Customer Strategy Management/International Conference on Innovation and Management/Journal Of Computers/Total Quality Management/Psychology & Marketing/Journal of Information Technology Management/The Service Industries Journal/Journal of Services Marketing/ Transactions on Human-Computer Interaction/International Scholarly and Scientific Research & Innovation/International Journal Electronic Marketing and Retailing/International Journal of Information Management/Artificial Intelligence Review/Society for Consumer Research Winter Conference/Sloan Management Review/Marketing Science/International Conference on User Modeling/Information Resources Management Journal/DELOS Network of Excellence Workshop/Electronic Markets/ACM Transactions on Interactive Intelligent Systems/ACM RecSys 2010 Workshop/Journal of International Technology and Information Management/Australasian Conference on Information Systems/Journal of Research in Interactive Marketing/Proceedings of the Nineteenth DIGIT Workshop/International Workshop on Behavior Change Support Systems (BCSS)/SIGBPS Workshop on Business Processes and Service/International Conference on eBusiness, eCommerce, eManagement, eLearning and eGovernance	Each 1

Referring to the origin of studies, United States of America (USA) ranked number 1 with 75 (42%) studies, followed by China with 20 (11%) studies, Taiwan in third place with 16 (9%) studies, Hong Kong and Canada in fourth place with 13 (7%) studies each, followed by Korea in fifth place with eight (5%) studies and Germany in sixth place with six (3%) studies. The Netherland was ranked the seventh with four (2%) studies followed closely by Switzerland in eighth place with two studies. Austria, Italy, Belgium, Greece, UAE, and India stand in ninth place with one study each. In addition to that, studies involving two countries (i.e. data collected two countries) such as USA and China, USA and Korea, Canada and China, Hong Kong and Austria, Hong Kong and Switzerland, Hong Kong and Macau, and New Zealand and Canada were also placed in ninth position with one study each. Figure 2.2 shows the list of countries and number of articles published.

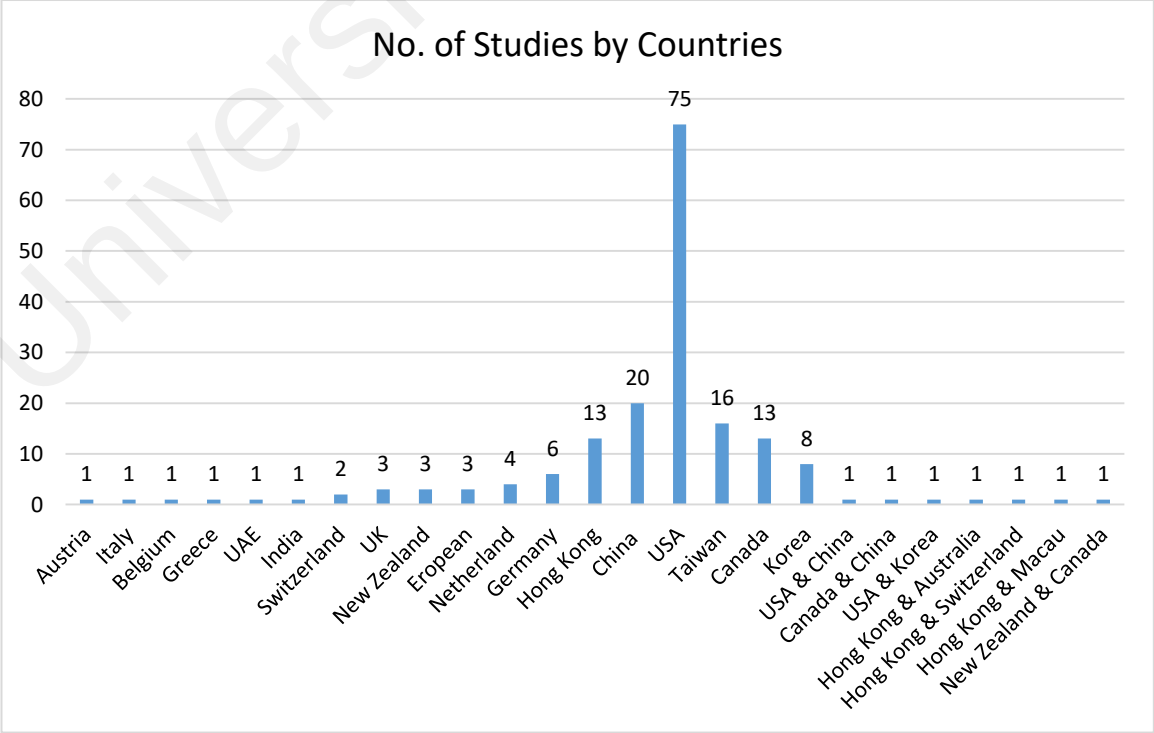


Figure 2.2: Number of Studies by Countries

Next, content analysis of past studies revealed four type of researches, namely Laboratory Experimental Survey, Field Survey, Secondary Web Panel Data, and Conceptual/Literature Review based studies. 97 (54%) studies used experimental survey as research method, followed by 43 (24%) studies that used field survey, 23 (13%) studies used secondary panel data, and 16 (9%) studies were general review, systematic literature review, and conceptual papers. Hence, majority of prior OPR focused studies were experimental (i.e. a controlled experiment - contrary to real environment - was used to investigate the underlying phenomenon). Figure 2.3 shows the numbers of articles published using various research methods.

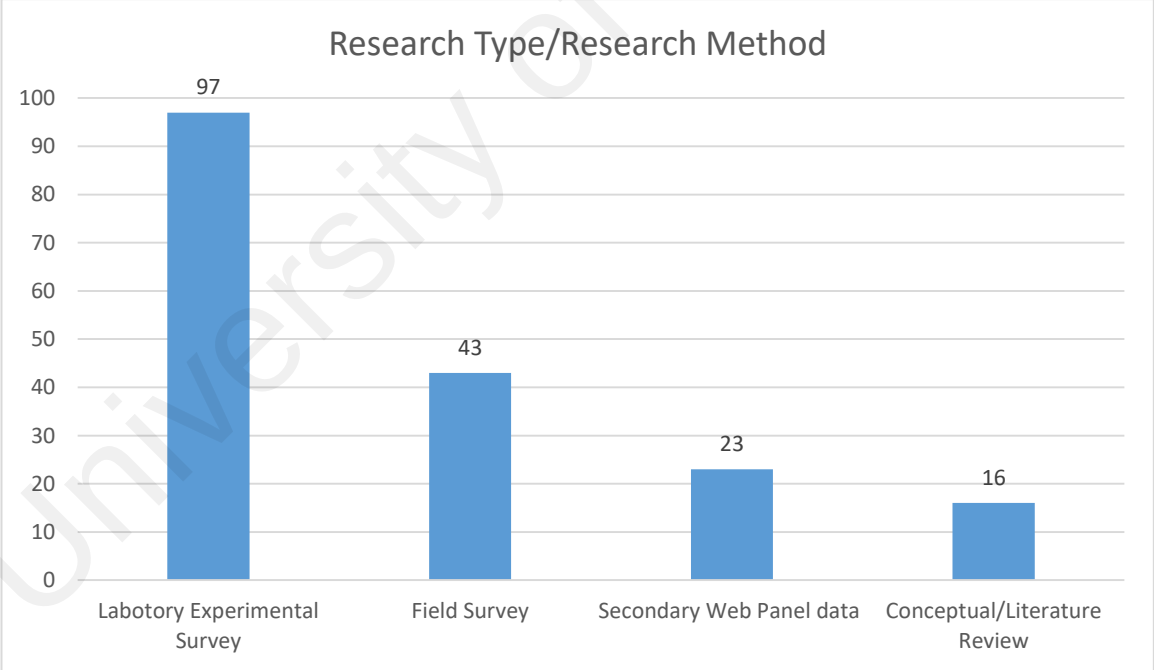


Figure 2.3: Studies by Research Type

Referring to the unit of analysis, 140 (78%) studies collected data from Individuals via survey. Out of 140 studies, 66 studies collected data from university and college students,

followed by 35 studies that just mentioned that they collected data from individuals/ respondents/ participants/subjects; 19 studies focused on Web/Internet users; 13 studies conducted survey with online customers of openrice.com, epinions.com, and bizrate.com; 2 studies focused on university staffs; and 5 studies – each focused on the users of Expedia.com, MySimon.com, Facebook.com, Mytone.com, and recommender system as unit of analysis. Apart from 140 studies, 23 studies used Secondary Web Panel Data from Amazon.com, Yelp.com/Expedia, Hotels.com, Orbitz, Priceline, TripAdvisor, and Yelp/ CNET Download.com/ GameSpot.com/ Tripadvisor/ Tmall.com. Majority of the studies (16) used panel data from Amazon in order to investigate the economic impact of product recommendation generated from two distinct sources, namely "system generated recommendations" and "consumer reviews". Table 2.3 shows the list of unit of analysis focused in prior OPR studies.

No.	Unit of Analysis	No. of Articles Published
1	University and college Students	66
2	Individuals/Respondents/Participants/Subjects	2+8+12+13=35
3	Web/Internet users	19
4	University staff	02
5	Online customers of (openrice.com/epinions.com and bizrate.com)	13
6	Users of Expedia.com/MySimon.com/Facebook/ Mytone.com/ Recommendation Agents	Each 01 (5)
7	Expedia, Hotels.com, Orbitz, Priceline, TripAdvisor, and Yelp/ CNET Download.com/GameSpot.com/Tripadvisor/Tmall.com (Panel Data)	Each 01 (5)
8	Amazon.com (Panel Data)	16
9	Yelp.com (Panel Data)	02
Total Articles Published		**163**

Table 2.3: Unit of Analysis in Prior OPR Studies

As discussed above, most of the previous studies (140 articles) had used survey method either in laboratory experiment or field study. Out of 140 studies, 77 (43%) studies have use Structural Equation Modeling (SEM) in order to test the theoretical models. Out of

77 studies, 49 studies used Partial Least Square (PLS-SEM), 17 studies used Analysis of Moment Structure (AMOS-SEM), and 11 studies used Linear Structural Relation (LISREL-SEM). In addition to that, 21 studies had used Statistical Package for Social Sciences (SPSS) to conduct regression analysis. Furthermore, 41 studies had used SPSS for conducting various types of analysis of variance (i.e. ANOVA, MANOVA, ANCOVA, MANCOVA) and other tests such as t-test. 23 studies had applied different techniques of data mining, web content analysis, and econometric analysis to analyse the panel data/web contents. In addition to this, 16 conceptual studies had also used various techniques such as Grounded Theory Literature Review Method, Synthesis of Literature, Meta-analysis, Multi-dimensional Analysis, Cross-dimensional analysis, taxonomy, and Content analysis. Table 2.4 shows the data analysis techniques used in prior literature. The following section presents identification of factors pertaining to OPR performance.

Table 2.4: Data Analysis Techniques Used in OPR Studies

No.	Data Analysis Techniques	No. of Articles Published
1	PLS-SEM	**49**
2	AMOS-SEM	**17**
3	LISREL-SEM	**11**
4	SPSS-Regression Analysis	**21**
5	SPSS-ANOVA/MANOVA/ANCOVA/MANCOVA/t-test/Sobel test	**41**
6	Data Mining/Web Content analysis/Econometric Analysis	**23**
7	Grounded Theory Literature Review Method/Synthesis of Literature/Meta-analysis/Multi-dimensional Analysis/Cross-dimensional analysis, taxonomy/ Content analysis	**16**
Total Articles Published		**179**

2.2.1. Factors Influencing the OPR Effectiveness

Prior studies have adopted various research approaches to examine OPR phenomenon. Literature content analysis revealed that past researches on the effect of OPR can be

classified into two categories based on unit of analysis: market-level analysis and individual-level analysis (Lee and Lee, 2009). At the market-level analysis, studies emphasized on market-level parameters (e.g. product sales). These studies (Lin, 2014; Modammi, 2010; Chevalier and Mayzlin, 2006; Clemons, Gao, and Hitt, 2006; Dellarocas, Zhang, and Awad, 2007; Duan, Gu, and Whinston, 2008) used objective panel data (e.g. the rating and the valence of OPR) extracted from e-commerce websites (e.g. Amazon) to investigate the effect of OPR on product sales. Whereas, at the individual-level analysis, prior studies (Benlian et al., 2012; Cheung et al., 2009; Huang, 2014; Huang et al., 2013; Xiao & Benbasat, 2007; Xu et al., 2014; Zhu & Zhang, 2010) conducted laboratory experimental or field survey to examine the impact of OPR on consumers' various beliefs, attitude, and purchase intention. The current study focuses on individual-level of OPR research. Therefore, the literature review is conducted to identify key factors pertaining to OPR effectiveness and to propose a conceptual framework that enhances our understanding of the underlying determinants of OPR effectiveness over three stages of OPR adoption (i.e. pre-usage, initial usage, and continued usage). To this end, the researcher draws on social communication framework (Hovland, 1948; Cheung & Thadani, 2010) and three-stage adoption process theory (Looney et al., 2008; Meuter et al., 2005; Rogers, 2003) as guiding theories to conduct a systematic review of OPR literature in order to identify factors pertaining to OPR effectiveness across the three stages of OPR adoption. The researcher adopted the "Five Steps Grounded Theory Literature Review Method" (Wolfswinkel et al., 2013), to systematically review prior OPR literature. This five steps method assisted to conduct a thorough theoretical content analysis of the OPR literature. A detailed description of the method is provided in the Appendix-B, and the review output are presented as conceptual models in the following sections.

According to the social communication framework, there are four major elements in social communication (Cheung & Thadani, 2010, pp. 332), as depicted in Figure 2.4:

1) The communicator refers to the person who transmits the communication.
2) The stimulus refers to the message transmitted by the communicator.
3) The receiver is the individual who responses to the communication.
4) The response is made to the communication by the communicate

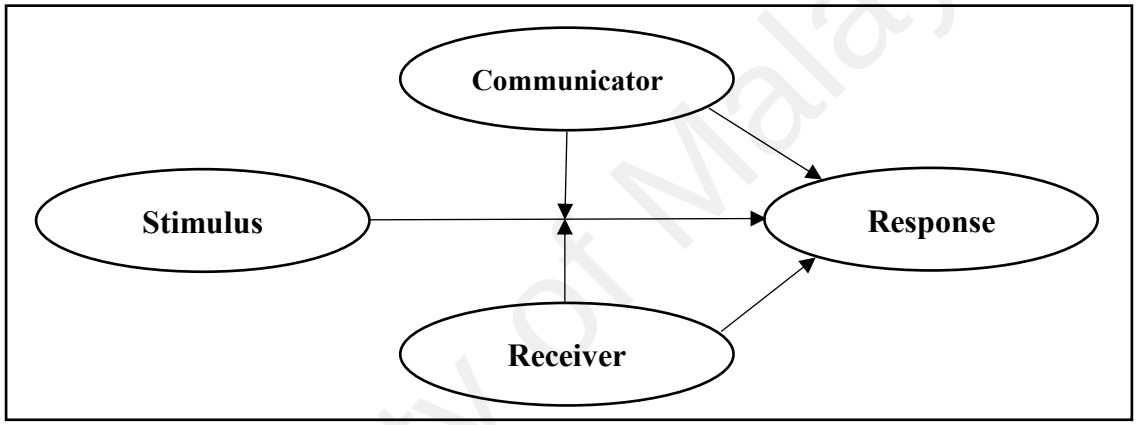


Figure 2.3: Social Communication Framework

Source: (Hovland, 1948; Cheung & Thadani, 2010)

In order to identify the factors pertaining to above mentioned four dimensions of OPR effectiveness, the searches on OPR produced 391 articles in total. Following the guidelines of the systematic review methodology, which is strongly recommended in writing sound IS literature reviews (Webster and Watson, 2002), inclusion and exclusion criteria were applied to the 391 articles. The criteria were followed to ensure that the articles selected for further analysis are appropriate for the purpose of literature review. The researcher specified five inclusions criteria as follow: (1) article must be academic and peer reviewed in nature; (2) online recommendation should be the major focus of examination in the article; (3) researchers had a defined sample; (4) articles that addressed

the effect of OPR; (5) article dealt with individual-level examination of OPR in business-to-consumer settings. The exclusion criteria were applied to: (1) articles with an entirely conceptual or theoretical and no research design; (2) article dealt with Market-Level examination of OPR. After applying 5 inclusion and 2 exclusion criteria to 391 articles, 251 articles were excluded from the analysis and remaining 140 articles were included for further analysis.

Prior OPR studies have demonstrated the different factors of OPR effectiveness. The researcher systematically analysed the OPR literature to identify relevant factors that were classified under the four elements of social communication (Hovland, 1948). Social communication is defined as "the process by which an individual (the communicator) transmits stimuli to modify the behaviour of other individuals (receivers)" (Hovland, 1948, p. 371). The OPR is a new form of communication between a receiver and a sender, which comprises four major dimensions of OPR effectiveness that are depicted in Figure 2.5. The researcher systematically reviewed the 140 articles in order to identify factors pertaining to each dimension of OPR. It enabled the researcher to identify 54 mutually exclusive factors that influence the OPR effectiveness on consumers' perceptions of adopting services. The 54 factors identified representing four different dimensions:

1) The communicator (OPR source) who transmits the online recommendation,
2) The online recommendation in the form of social communication content transmitted by OPR source,
3) The consumer as a receiver who receives and responds to online recommendations (OPR receiver),
4) The responses made to OPR by the receiver.

An overview of these factors pertaining to each dimension is depicted in Figure 2.5 and briefly discussed in the following sub-sections.

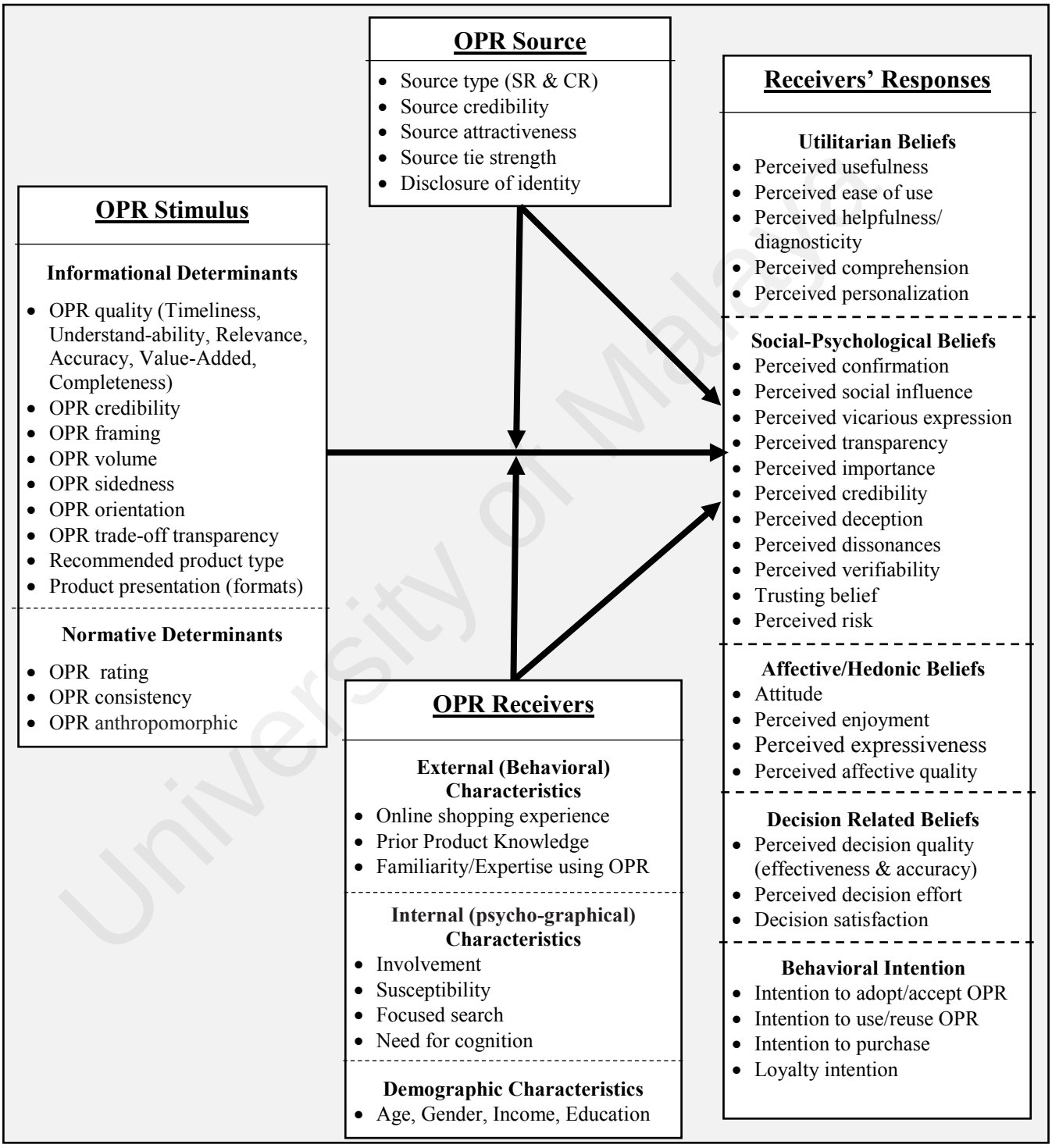


Figure 2.5: Framework of Factors Influencing to OPR Performance

2.2.1.1. Factors Influencing the Source of OPR

Factors influencing the source of OPR represent the characteristics of the OPR source. Five factors pertaining to this dimension were identified in OPR literature: source type, source credibility, source attractiveness, source tie strength, and disclosure of source identity. The prior studies have shown that these five factors influence the effectiveness of OPR on consumers' perceptions of adopting services. Table 2.5 shows the list of these factors and their respective definitions.

Table 2.5: Factors Influencing the Source of OPR

Sr. No.	Constructs	Definition
1	Source type	Product recommendations (OPRs) generated from recommender system and consumer reviews (Benlian et al., 2010, 2012).
2	Source creditability	OPRs source's ability (expertise) or motivation to provide accurate and truthful information (Trustworthiness) (Cheung & Thadani, 2012).
3	Source attractiveness	Attractiveness encompasses similarity, familiarity and likability and reflects the extent to which the consumers identifies with the source (Cheung & Thadani, 2012).
4	Tie strength	The level of intensity of relationship between the source of online recommendations and the consumer (Cheung & Thadani, 2012).
5	Disclosure of identity	The disclosure of one's identity (i.e. OPRs source) to others (i.e. consumers) (Cheung & Thadani, 2012; Forman, Ghose, & Wiesenfeld, 2008; Racherla & Friske, 2012).

2.2.1.2. Factors Influencing the OPR Stimulus

Factors pertaining to OPR stimulus represent the characteristics of OPR as a form of social communication content. Twelve (12) factors pertaining to the OPR stimulus were identified in the OPR literature: OPR quality (timeliness, understand-ability, relevance, accuracy, value-added, completeness), OPR credibility, OPR framing, OPR volume, OPR

sidedness, OPR orientation, OPR trade-off transparency, recommended product type, product presentation (formats), OPR rating, OPR consistency, and OPR anthropomorphic. These twelve factors were further divided into two categories: Informational Determinants and Normative Determinants. According to the dual process theory (Deutsch & Gerard, 1955), informational determinants are based on the content of recommendations, whereas normative determinants arise from the norms/expectations of others that are explicit or implicit in the choice preference of the group or community. Dual-process theory considers how different types of influences (normative factors vs. informational factors) affect the persuasiveness of online recommendation. Both informational and normative determinants work together to shape the consumers' information-credibility judgment (Deutsch & Gerard, 1955). To this end, informational determinants comprise OPR quality (timeliness, understand-ability, relevance, accuracy, value-added, completeness), OPR credibility, OPR framing, OPR volume, OPR sidedness, OPR orientation, OPR trade-off transparency, recommended product type, and product presentation (formats). Whereas normative determinants refer to OPR rating, OPR consistency, and OPR anthropomorphic. Past OPR literature shows that these factors influence the effectiveness of the online recommendations on consumers' perceptions of adopting services. Table 2.6 shows the list of these factors and their definitions.

Table 2.6: Factors Influencing OPR Stimulus

Sr. No.	Constructs	Definition
1	OPR quality: (Timeliness, Understand-ability, Relevance, Accuracy, Value-Added, Completeness)	The OPR quality refers to the persuasive strength of arguments embedded in OPR (Wang & Strong, 1996): - Timeliness concerns whether the OPR is current, timely, and up-to-date. - Understand-ability refers to readability, interpretability, and ease of understanding, as well as language, semantic, and lexical expressions used by OPR. - Relevance refers to the extent to which OPR are applicable and helpful for a task at hand. - Accuracy concerns with reliability of the OPR. It represents a user's perception that the OPR is correct. - Value-added is the extent to which information is beneficial and provides advantages from their use. - Completeness is defined as the extent to which information is of sufficient breadth, depth, and scope for the task at hand. - Extent to which OPR elaborate product attributes (Chua & Banerjee, 2014)
2	OPR volume	The extent to which the quantity or volume of available data is appropriate for a specific task (Wang & Strong, 1996).
3	Recommended Product Type	Search vs Experience attributes of the focal product/service in OPR (Benlian et al., 2010, 2012; Mudambi & Schuff, 2010).
4	OPR Rating	Rating refers to numerical information comprising from 1 to 5 point scale based on past consumers evaluation of the products (Duan et al., 2008; Lin, 2014)
5	OPR sidedness	A one-sided OPR presents either the positive or negative arguments, but not both. A two-sided OPR includes both positive and negative arguments (Cheung & Thadani, 2012)
6	OPR consistency	The OPR congruence to others' opinions about the focal service (Cheung & Thadani, 2012).
7	OPR framing/ valence	The valence of OPR shows that whether it is positive or negative (Cheung & Thadani, 2012).
8	OPR orientation	Attribute-centric versus simple OPR (Cheung & Thadani, 2012; Park & Kim, 2009).
9	OPR trade-off transparency	Trade-off relationships among attributes of the products (Xu et al., 2014).
10	Anthropomorphic	Humanoid embodiment and voice output (Qiu & Benbasat, 2009).
11	OPR presentation	Product presentation formats: static pictures, videos without narration, videos with narration, and virtual product experience (Jiang & Benbasat, 2007a).
12	OPR credibility	OPR is believable, true, or factual recommendation (Cheung et al., 2009).

2.2.1.3. Factors Influencing Receiver of the OPR

Factors influencing the receiver of OPR represent the characteristics of the consumer who receives and responds to the online recommendations. Content analysis of OPR literature identified eleven factors which are divided into three major categories of consumers' characteristics: (1) *External (Behavioural) Characteristics* comprise online shopping experience, prior product knowledge, and familiarity/expertise using OPR; (2) *Internal (Psycho-graphical) Characteristics* consist of involvement, susceptibility, focused search, need for cognition; and (3) *Demographic Characteristics* include Age, Gender, Income, Education. Literature reviews show that these factors significantly influence the effectiveness of online recommendations on consumers' perceptions of adopting services. Table 2.7 shows the list of these factors and their definitions.

Table 2.7: Factors Influencing the Receiver of OPR

Sr. No.	Constructs	Definition
1	Consumers' level of expertise	Consumers' level of expertise is an external behavioural characteristic refers to - Consumers' online buying experience - average times for Internet shopping per month (C. Park & Lee, 2009a). - Consumers' prior knowledge of products (Yoon, Hostler, Guo, & Guimaraes, 2013). - Consumers' prior experience, knowledge, or familiarity with OPR (Cheung & Thadani, 2012; Martin & Lueg, 2013).
2	Consumers' involvement	The degree of psychological identification and affective, emotional ties the consumer has with OPR (Cheung & Thadani, 2012).
3	Consumers' susceptibility	Consumers' tendency to learn about products and services by seeking information from others- it is an internal (psycho-graphical) characteristic of the consumers (C. Park & Lee, 2009a).
4	Consumers' focused search	The extent to which consumers have specific information needs in mind during their active search (Zhang & Watts, 2008).
5	Consumers' need for cognition	Consumers' innate desire to think about and process information (Gupta & Harris, 2010; Qahri Saremi, 2014).
6	Consumers' demographics	Demographical attributes of consumers/OPR users (e.g. gender, age, education).

2.2.1.4. Factors Influencing the Receiver's Response

Factors influencing to the Response refers to the consumers' responses toward online recommendations. OPR literature review revealed twenty seven (27) factors pertaining to consumers' responses towards online recommendations: perceived usefulness, perceived ease of use, perceived helpfulness/diagnosticity, perceived comprehension, perceived personalization, perceived OPR importance, perceived confirmation, perceived social influence, perceived vicarious expression, perceived transparency, perceived credibility, perceived deception, perceived dissonances, perceived verifiability, trusting belief, perceived risk, attitude, perceived enjoyment, perceived expressiveness, perceived affective quality, perceived decision quality (effectiveness & accuracy), perceived decision effort, decision satisfaction, intention to adopt/accept OPR, intention to use/reuse OPR, Intention to purchase, and Loyalty intention. These twenty-seven factors were further divided into five (5) response categories: (1) Utilitarian/Instrumental Beliefs, (2) Social-Psychological Beliefs, (3) Affective/Hedonic Beliefs, (4) Decision Related Beliefs, and (5) Behavioural Intention.

Utilitarian Beliefs refer to the "*consumers' cognitive evaluation of the utility of using a system in terms of purpose fulfilment and problem solving"* (Babin, Darden, & Griffin, 1994; Zhou, Jin, & Fang, 2014). To this end, utilitarian beliefs consist of perceived usefulness, perceived ease of use, perceived helpfulness/diagnosticity, perceived comprehension, perceived personalization, and perceived importance of OPR.

Social-Psychological Beliefs is defined as "*consumers' perception towards using a system is influenced by others' presence* (Allport & Lindzey, 1959). For example, a consumer-perceived risk refers to uncertainty that a poor product choice might harm a

consumer's ego or may result in embarrassment before his or her friends and family (Xiao & Benbasat, 2007). Social psychologists deal with the factors that lead human behaving in a given way in the presence of others, and look at the conditions under which certain behaviours/actions and feelings occur (Allport & Lindzey, 1959). However, social-psychological beliefs include perceived confirmation, perceived social influence, perceived vicarious expression, perceived transparency, perceived credibility, perceived deception, perceived dissonances, perceived verifiability, trusting belief, and perceived risk.

Affective/Hedonic Beliefs refer to "*consumers' emotions or feelings towards using a system, representing an overall judgment based on the usage experience itself*" (Babin et al., 1994; Zhou et al., 2014). However, affective/hedonic beliefs comprise attitude, perceived enjoyment, perceived expressiveness, and perceived affective quality.

Decision Related Beliefs refer to the *consumers' perceptions of decision accuracy, confidence, effort, and satisfaction from processing product information, evaluating alternatives, to arriving at choice decision* (Xiao & Benbasat, 2007). However, consumers' decision beliefs consist of perceived decision quality (effectiveness & accuracy), perceived decision effort, and decision satisfaction.

Behavioural Intentions refers to the "*consumers' approach or avoidance response towards online recommendations* (OPRs)*"* (Benlian et al., 2012)**.** Consumers' behavioural intentions include intention to adopt/accept OPR, intention to use/reuse OPR, intention to purchase, and loyalty intention. Table 2.8 shows the list of these factors and their definitions. The following subsection presents the inter-relationship among these factors.

Table 2.8: Factors Influencing the Consumers' Response towards OPR

Sr. No.	Constructs	Definition
1	Perceived Usefulness	Perceived usefulness refers the degree to which a person believes that using OPR is useful in evaluating the product (Benlian et al., 2012).
2	Perceived Ease-of-Use	Perceived ease of use refers the degree to which a person believes that using OPR is easy (Benlian et al., 2012).
3	Perceived helpfulness/ diagnosticity	Consumers' perception of the helpfulness of OPR (Cheung & Thadani, 2012; Sen & Lerman, 2007). As the extent to which consumers perceive the OPR is helpful for fully evaluating a product (Jiang & Benbasat, 2007a).
4	Perceived comprehension	Consumers' perceptual assessment of the amount of cognitive resources expended on OPR comprehension (Huang et al., 2013).
5	Perceived personalization	Customer's perception of an OPR personalization (i.e. the extent to which the OPR understands and represents his or her personal needs)(Komiak & Benbasat, 2006).
6	Perceived OPR Importance	Consumers believe that information contained in OPR is important and necessary for them to make their purchase decisions (Liu & Zhang, 2010). It refers to quality and value of OPR.
7	Perceived expectation-confirmation/Performance expectancy	Customers' perception of congruence between expectation of OPR use and its actual performance (Cheung & Thadani, 2012).
8	Perceived social influence	Informational and normative social influence (Deutsch & Gerard, 1955; Ku & Tai, 2013): Informational social influence is defined as "influence to accept information obtained from another as evidence about reality," and normative social influence is defined as the "influence to conform to the expectations of another person or group".
9	Perceived vicarious expression	Degree to which OPR conveys vivid experiences of a product that could be felt by receiver (Li, Huang, Tan, & Wei, 2013).
10	Perceived transparency	The extent to which the user understands why a certain recommendation is offered (Köhler, Breugelmans, & Dellaert, 2011).
11	Perceived credibility	Extent to which consumers perceive that recommendations are believable, true, factual and trustworthy (Cheung et al., 2009).
12	Perceived deception	Consumers' perception that online recommendations are manipulated to induce desired behavioral changes in consumer decision making – changes that may be to the detriment of the consumers (e.g. purchasing an item based on misleading representations of their characteristics made by the online retailer) (Román, 2010).
13	Perceived dissonances	Extent to which consumers' perceive inconsistency between OPR and their preferences (Pfeiffer & Benbasat, 2012).
14	Perceived verifiability	The extent to which consumers perceive that the appropriateness of online recommendations can be determined (Xiao & Tan, 2006).
15	Trusting belief	Consumers' trust in OPR's competence, benevolence, and integrity (Benlian et al., 2012).
16	Perceived risk	Consumer's belief about the potential uncertain negative outcomes from the online transaction (Kim et al., 2008).
17	Perceived decision quality	Extent to which the customers have decided to purchase recommended products fit their needs or taste (Zhang et al., 2011). Decision quality is indicated by decision confidence and effectiveness (Xiao & Benbasat, 2007).
18	Perceived decision Effort/Effort expectancy	Consumers' perception of cognitive effort exerted in processing product information, evaluating product alternatives, and arriving at choice decision (Xiao & Benbasat, 2007).
19	Satisfaction	A positive evaluation of customers' experience with OPR or online shopping (Bhattacherjee, 2001b; Xiao & Benbasat, 2007).
20	Attitude	Consumers' overall evaluations of the service (Cheung & Thadani, 2012). (Attitude toward OPR, product, service).
21	Perceived enjoyment	Extent to which consumers' interaction with OPR is perceived to be enjoyable in its own right aside from the utilitarian value of the OPR (Davis, Bagozzi, & Warshaw, 1992).

22	Perceived expressiveness	Consumers' perceptions of the extent to which a virtual advisor conveys human-like emotions and feelings in its communication (Sameh, Benbasat, & Cenfetelli, 2010).
23	Perceived affective quality	An individual's primary affective reactions towards OPR (Benlian et al., 2010, 2012).
24	Intention to adopt/accept/use OPRs	Consumer's behavioral intention to accept/adopt or use OPR (Huang et al., 2013)
25	Intention to reuse OPRs	Consumers' willingness to reuse OPR in future buying decision (Benlian et al., 2012).
26	Intention to purchase/shop online	Consumers' willingness to pay for or purchase the service/product (Benlian et al., 2012)
27	Loyalty intention	Consumer's intention to buy from the website in the future, and to recommend it to other consumers (Román, 2010).

2.2.1.5. Interrelationships between the Four Elements of OPR

The literature review revealed that purchase intention, perceived helpfulness, trustworthiness, and perceived usefulness are the most widely studied variables of the OPR studies. A number of studies have investigated the consumers' intention to accept OPR or intent to reuse OPR at the initial adoption level. Almost 46% of studies have focussed on the factors influencing consumers' purchase intention. Content analysis revealed that overall existing researches have focused on the following three aspects of OPR:

1) The impact of OPR characteristics (design/features) on consumers' evaluation beliefs and behavioural intention to use OPR.
2) The effect of OPR usage on consumers' OPR evaluation beliefs including decision-making variables (i.e. decision effort, decision quality) and OPR reuse intention.
3) The influencing factors of consumers' intention to accept OPR, and the purchase intention of recommended product.

First stream of OPR researches have used experimental research design to investigate how different characteristics (e.g. quality, valence, volume, credibility, framing, trade-off transparency, presentation) of OPR influence consumers' various beliefs and behavioural intention. For example, Filieri and McLeay (2014) found that product ranking, information accuracy, information value-added, information relevance, and information timeliness are strong predictors of traveller's intention to use online recommendations. Cheung et al. (2008) found that information quality (timeliness, relevance, accuracy and comprehensiveness) and argument quality (source expertise and source trustworthiness) have effect on information usefulness, which in turn influence the information adoption. Park and Lee (2009b) investigated how the valence of online recommendation (positive vs. negative) via electronically spread word of mouth contribute to the effect of OPR.

Recently, Luo (2015) reported that higher perceived quality of OPR is associated with higher consumer shopping efficiency. The impact of perceived quality of OPR on screening efficiency is stronger for experience products than for search products, but the effect of perceived quality of OPR on screening efficiency is stronger for search products than for experience products. Whereas, Xu et al. (2014) found that the use of the trade-off transparency characteristics of recommender system significantly influenced the consumers' perception of enjoyment and product diagnosticity which in turn influence perceived decision effort and perceived decision quality. They further reported that consumers' perception of decreased decision effort and increased decision quality positively impact their intention to use OPR. A few studies (Hess et al. 2009; Qiu and Benbasat 2009) have also investigated the importance of social presence feature in online recommendations in building consumers' trust, improving consumers' perception of enjoyment and usefulness of OPR, as well generating increased behavioural intentions to use OPR. For example, Hess et al. (2009) found that vividness (text, voice, and animation)

of OPR significantly influenced consumers' perception of social presence which eventually increased their trust in OPR. Similarly, Qiu and Benbasat (2009) examined the humanoid embodiment and human voice-based communication features of OPR and found that they both significantly influence consumers' social presence, which subsequently enhanced their trust, perceived enjoyment, and OPR usage intention. Literature content analysis revealed that so far, there is no existing study simultaneously examining the influence of all three elements (communicator, stimuli, and receiver) on consumers' response towards OPR use.

Second stream of OPR researches focused on investigating the effect of OPR usage on consumers' evaluation beliefs, decision-making processes, and satisfaction. For example, Benlian et al. (2012) conducted an experiment to investigate the differential impact of OPR type (system recommendation and user recommendations) on consumers' evaluation beliefs. They found that consumers have greater perception of usefulness and ease of use with system generated recommendation than that with user recommendations. In contrast, consumers perceive greater affective quality and trusting belief in consumer reviews than in system recommendation. They also found that perceived usefulness, perceived affective quality, and trusting beliefs significantly mediate the impact of OPR usage on intention to reuse OPR and intention to purchase recommended product. Several other past studies (Häubl & Murray, 2003; Häubl & Trifts, 2000; Hennig-Thurau et al., 2012; Lee & Benbasat, 2011; Su et al., 2008; Todd & Benbasat, 2000; Xu et al., 2014) also revealed that OPR usage help the consumers to minimize information overload, lower search efforts, and improve decision quality. For example, Häubl and Trifts (2000) reported that the use of online recommendations and product comparison matrix significantly improves the consumers' decision quality and minimize search efforts via decreasing the size of consideration sets. Dabholkar and Sheng (2012b) found that greater

consumer participation in using OPR leads to more satisfaction, greater trust, and higher purchase intentions. Aljukhadar et al. (2012) conducted an experimental study to investigate the impact of information overload on consumer decision strategy. They reported that that information overload increased the usage of recommender system and also consumers' conformance to online recommendation. Consumers had greater confidence in their choices when they conformed to the system generated recommendations.

Third stream of OPR research is directed towards understanding the influencing factors of consumers' intention to accept OPR and purchase intention. A number of studies have also used Technology Acceptance Model (TAM) to investigate the initial acceptance or adoption of OPR. For example, Sheng and Zolfagharian (2014) integrated consumers' participation into TAM to show that perceived ease of use, perceived usefulness and perceived enjoyment have significant impact on consumers' intention to use or accept OPR. Benbasat and Wang (2005) incorporated trust in TAM to show that consumers' acceptance of OPR is significantly influenced by perceived ease of use, perceived usefulness, and trusting belief. Komiak and Benbasat (2006) investigated how perceived personalisation and familiarity impact consumers' intention to accept OPR by analysing underlying mechanisms of cognitive and emotional trust. Fang (2014) found that beyond the conventional cognitive path (cognitive stimuli and the credibility of OPRs), the affective path (affective stimuli and arousal) can also contribute to OPR adoption. Whereas, Huang et al. (2013) conducted study to investigate the comprehension and assessment of product reviews and demonstrated that perceived comprehension and perceived helpfulness significantly influence the consumer' intention to accept OPR. Wang and Benbasat (2009) found that users' intention to use decision aid is influenced by perceived restrictiveness, perceived cognitive effort and perceived advice quality.

Regarding the influencing factors of purchase intention, Dabholkar and Sheng (2012ab) examined the role of consumer participation in using OPR and found that higher levels of consumer participation led to greater satisfaction and trust, which in turn, led to higher intention to purchase the recommended product. Benlian et al. (2012) found that perceived usefulness, perceived affective quality, and trusting belief have significant positive impact on consumers purchase intention. Based on the Toulmin's model of argumentation, Wang and Doong (2010) demonstrated that perceived argument quality and source credibility of OPR significantly influenced consumers' intention to purchase recommended product. Recently, Baum and Spann (2014) investigated the impact of interplay between system recommendations and consumer reviews on consumers' intention to follow OPR. They demonstrated that providing positive opinions of previous customers in addition to system recommendation, it will increase the effectiveness of OPR which positively impacts consumers' purchase decision. In addition to that, they also found that providing consumer reviews does not necessarily have to be beneficial for an e-retailer, as inconsistent recommendations will negatively influence consumers' purchase decisions.

Table 2.9 shows the list of factors influencing to consumers' intention towards OPR usage and the related studies.

Table 2.9: Factors Pertaining to Consumers Intention towards OPR Usage

Source	Factors Pertaining to Initial Acceptance/Adoption of OPR (Intention to accept/adopt/use/reuse OPR)							
	Perceived Decision Effort	Perceived Decision Quality	Satis-faction	Perceived Ease of use	Perceived Usefulness	Trusting Beliefs	Perceived Affective quality	Perceived Enjoyment
Benlian et al. (2012)				√	√	√	√	
Xu et al. (2014)	√	√						√
Huang et al. (2013)								
Sheng and Zolfagharian (2014)				√	√			√
Benbasat and Wang (2005)				√	√	√		
Komiak and Benbasat (2006)						√		
Baum and Spann (2014)					√			
Qin and Kong (2015)						√		
Fang (2014)							√	
Wang and Benbasat (2009)	√							
Häubl and Trifts (2000)	√	√						
Häubl et al. (2004)	√	√						
Ku (2011)					√			√
Awad and Ragowsky (2008)				√	√	√		
Tsao and Hsieh (2012)			√			√		
Lee, Cheung, Sia, and Lim (2006)				√	√			√
Lee, Shi, Cheung, Lim, and Sia (2011)				√	√			
Sheng and Zolfagharian (2014)				√	√			√
Knijnenburg, Willemsen, Gantner, Soncu, and Newell (2012)	√		√					
Kowatsch and Maass (2010)				√	√			
Tsai and Chuang (2011)	√		√			√		
Bechwati and Xia (2003)	√		√					
Gudigantala, Song, and Jones (2011)	√	√	√					
Sameh et al. (2010)						√		√

The above discussed three streams of OPR researches revealed that most studies have focussed on OPR helpfulness and purchase intention as outcome variables. Furthermore, majority of the OPR studies have applied experimental research design. Out of 140 studies, 97 (69%) studies have experimentally investigated the pre-usage and initial usage of OPR. Less attention has been paid towards investigating the post-usage of OPR. While initial usage or adoption of OPR is an important first step toward realising the success of OPR, its continued use is more critical towards long-term viability of OPR. Many past researches (e.g. Bhattacherjee, 2001b; Jasperson et al., 2005; Kim & Malhotra, 2005) have long argued the criticality of continued use of information system (IS) or IS-enabled services. For example, Bhattacherjee (2001b) argued that "*long-term viability of an IS and its eventual success depend on its continued use rather than first-time use."* (pp.351-352). However, a further analysis of OPR researches has been carried out to identify and synthesize the factors that affect the OPR effectiveness across three stages adoption process of OPRs use (i.e. pre-usage, initial use, and repeated use).

2.2.2. Three Stage Adoption Process of OPR

Adoption of a service is not a one-time decision, it is a process that occurs over time and consists of a series of actions and decisions over a number of stages (Rogers, 2010; Xia & Lee, 2000). Recently, Montazemi and Saremi (2014) conducted a conceptual study on relationship between electronic word of mouth (e-WOM) recommendations and consumers' perceptions of adopting products/services, and the study demonstrated that consumers' adoption of e-WOM recommendations occurs in three stages of pre-usage, initial usage, and repeated use. They further reported that a consumer moves from initial awareness to forming favourable or unfavourable perceptions towards the online

recommendation service, to an initial decision to accept/adopt or reject the service, to use the service for the first time, and to finally confirm or reverse the initial adoption decision. At any of these stages, the consumer can decide to stop or discontinue using the service (Rogers, 2010; Xia & Lee, 2000). Over different stages of the service adoption process (i.e. pre-usage, initial usage, and continued usage), consumers may have different perceptions toward the service which could be effected by different characteristics of the service (Montazemi & Saremi, 2014; Xia & Lee, 2000). This phenomenon has been reported by various past IS studies. For example, Agarwal and Prasad (1997) conducted a research on the role of innovative characteristics in the acceptance of information technologies (IT) and demonstrated that same characteristics of IT innovation have different influence on consumers' perceptions in different stages of the adoption process. Similarly, Karahanna et al. (1999) conducted a study on IT adoption across time and found significant differences in users' perceptions towards IT usage in the pre-adoption stage and the post adoption stage. Subsequently, they called for a longitudinal research which tracks the same users over time through different stages of IT adoption process. Later on, a number of other studies (e.g. Montazemi & Saremi, 2013; Qahri Saremi, 2014; Venkatesh & Davis, 2000; Xia & Lee, 2000) also found that the same external factors influenced consumers' service adoption differently in different stages of the adoption process. For example, Venkatesh and Davis (2000) reported that the same antecedent factors have different impact on consumers' service usage in different stages of the adoption process. Likewise, Qahri Saremi (2014) found that perceived ease of use, perceived usefulness, and trust have different impacts on consumers' online recommendation adoption in three different stages of pre-usage, initial usage, and repeated usage.

In align with the discussion above, this study uses the traditional adoption process theory (Looney, Akbulut, & Poston, 2008; Meuter, Bitner, Ostrom, & Brown, 2005; Qahri Saremi, 2014; Rogers, 2010) to accurately capture the OPR adoption process in the past studies. The service adoption process is depicted in Figure 2.6, which consists of three stages: (1) pre-usage, (2) initial use, and (3) continued use. These stages consist of six steps, which are briefly explained here.

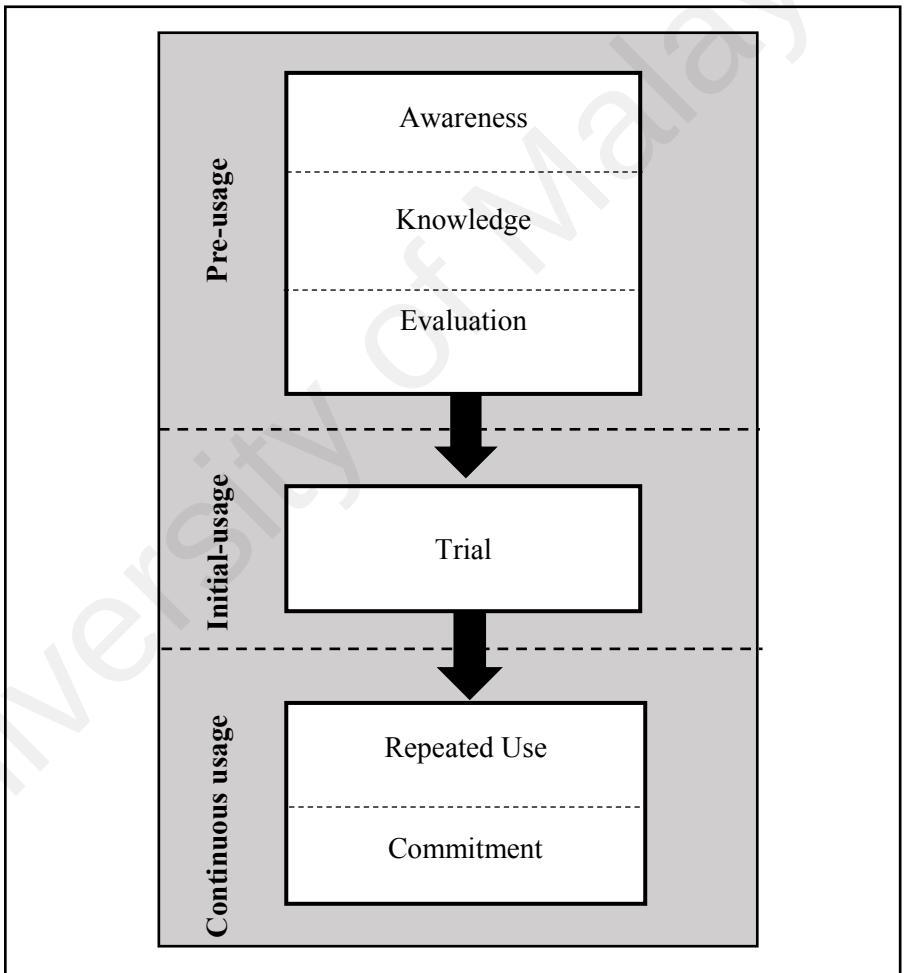


Figure 2.6: Three Stages of Adoption Process

\Source: (Montazemi & Saremi, 2014; Rogers, 2010)

Pre-usage stage consist of three steps (Looney et al., 2008; Rogers, 2010): (1) awareness, (2) knowledge, and (3) evaluation. At awareness, the existence of the service is exposed to the consumers. For example, online recommendations could introduce consumers about a product on Amazon. Once the consumers are aware about the recommended products, they proceed to the second and third steps, knowledge and evaluation, where they can gain understanding of the service and evaluate the service respectively. Consumers evaluate how the service would fulfil their needs and expectations (Looney et al., 2008). As online customers are unable to touch and experience the products before actual purchase, they face difficulty and uncertainty in evaluating product attributes and its expected performance in the pre-usage stage of adoption process (Benlian et al., 2012). OPR has potential features to reduce this uncertainty by assisting customers to better understand and evaluate the products (Benlian et al., 2012). Upon favourable product evaluation, they proceed to try it out for the first time and they move towards initial usage stage of the adoption process (Looney et al., 2008; Montazemi & Saremi, 2014).

At initial usage stage, consumers move from mental processing to actual use by trying the service for the first time (Montazemi & Saremi, 2014). After initial usage or adoption; expectation-confirmation, usefulness, ease of use, enjoyment, and trustworthiness of the service can be determined and then decision regarding whether to continue or discontinue using the service can be made (Montazemi & Saremi, 2014). If consumers willing to adopt the service, they proceed to the continued use stage, where they will be committed in using the service (Looney et al., 2008).

Continuous usage stage of service adoption consists of two steps: repeated use and commitment. In the repeated use, consumers determine their overall satisfaction with the service based on future consequences of continued or discontinued use. If they are

satisfied with the service, then they are likely to continue using the service otherwise not (Looney et al., 2008). This continued use is the critical stage, where the long-term viability of an IS and its eventual success dependent on (Bhattacherjee, 2001b).

Due to the significance of the three stages of service adoption process, this study investigated factors pertaining to OPR effectiveness over the three stages of pre-usage, initial usage, and continued usage. The analysis of literature was conducted in accordance to the "Five Steps Grounded Theory Literature Review Method" and a detailed description of the methodology and content analysis are presented in appendix-B1. Literature content analysis revealed that despite the importance of the three stages of adoption process, comparatively less studies have investigated the OPR effectiveness over the continuous usage stage. More specifically, no studies were conducted to investigate antecedent factors pertaining to consumers' OPR continuous usage intention for future buying. Figure 2.7 presents the twenty seven (27) factors representing five dimensions of consumer's response towards OPR effectiveness over three stages of adoption process and existence of the research gap in the literature (For detailed descriptions of analysis and results, see Appendix-B1).

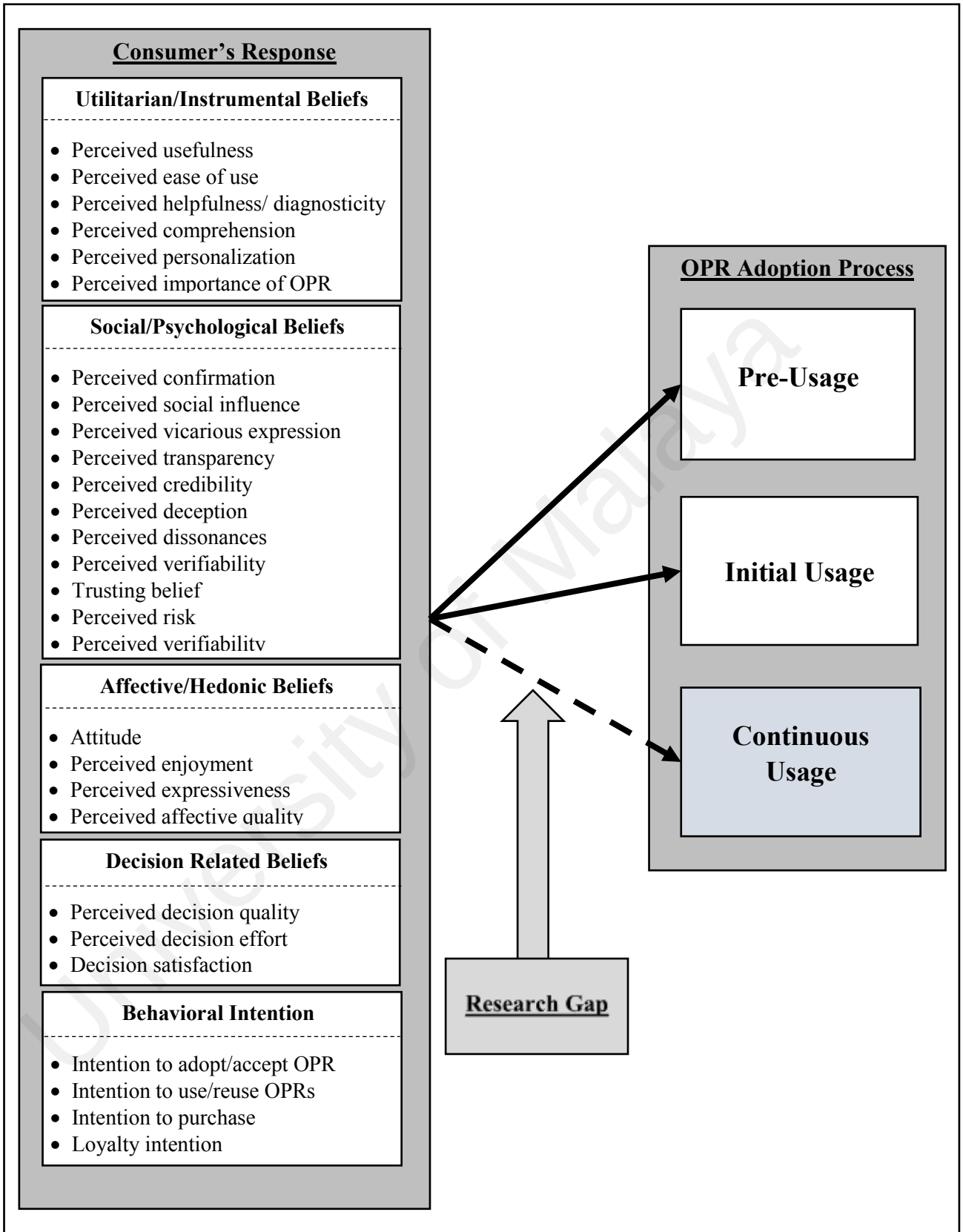


Figure 2.7: The 27 Factors Representing Five Dimensions of Consumer's Response towards OPR Effectiveness over Three Stages of Adoption Process

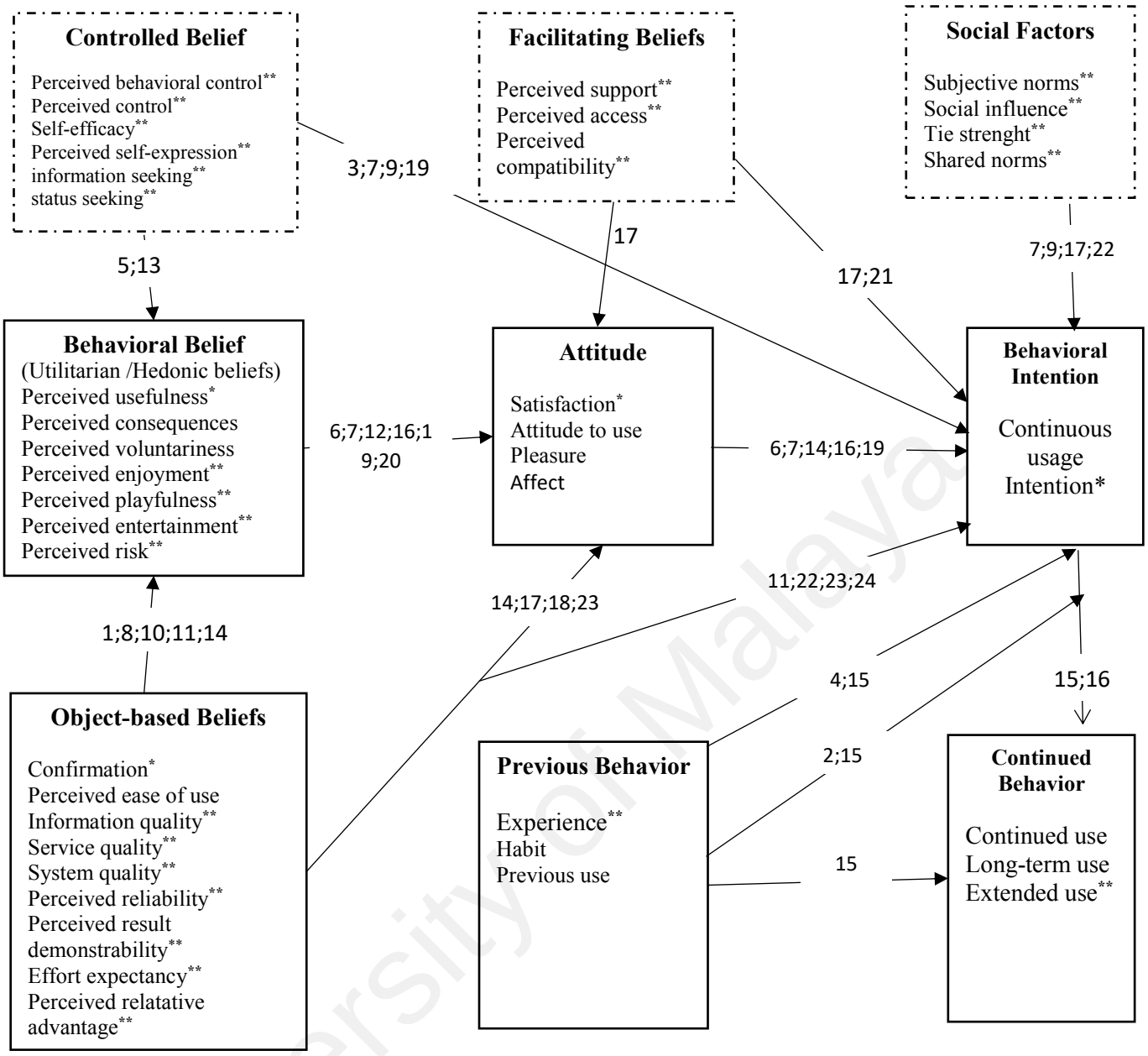
Content analysis over three stages of OPR adoption process revealed that majority of OPR studies (69%) have experimentally investigated the pre-usage and initial usage of OPR. Although understanding initial usage of OPR is an important first step toward realising the success of OPR mechanism, what happened after the initial OPR usage is ignored in the prior OPR literature. Do consumers continue OPR use after initial usage? It is yet required to be answered, because OPR continuous usage is critical toward long-term viability of OPRs mechanism. Moreover, no matter how useful OPR is, a critical issue is whether consumers accept and continue use OPR (Sheng et al., 2014). This is an important yet neglected issue in existing online recommendation research (Sheng et al., 2014). It is because of that researches investigating OPR adoption is also fairly recent (e.g. Benlian et al., 2012; Lin, 2014; Sheng et al., 2014; Sheng & Zolfagharian, 2014; Xu et al., 2014). However, no research has been done to help understand consumers' OPR continuous usage intention, which is an even more pressing issue because continuous usag intention has been shown to lead to usage commitment and long-term success of new technologies (Bhattacherjee, 2001b; Jasperson et al., 2005; Rogers, 2010; Thong et al., 2006). Furthermore, many past researches (e.g. Bhattacherjee, 2001b; Jasperson et al., 2005; Kim & Malhotra, 2005) have long argued for the criticality of continued use of information system (IS) or IS-enabled services. For example, Bhattacherjee (2001b) argued that "*long-term viability of an IS and its eventual success depend on its continued use rather than first-time use."* (pp.351). Hence, a significant number of consumers should have moved beyond the initial acceptance stage and use OPR on a continued basis. It is even more critical because online consumers have the freedom of choosing whether to stay with a website or leave the website at any time and from any location (Sheng et al., 2014). Therefore, OPR continued use at the individual customer level has become essential to the survival of many e-retailers and require to effectively manage and design OPR.

Consistent with the literature review findings of Sheng and Zolfagharian (2014), our literature content analysis also showed that no existing studies have investigated the consumers' response of OPR continuous usage intention. However, due to lack of literature in the context of OPR continuous usage, the author further reviewed the post-adoption literature in general to identify factors pertaining to IS continuous usage intention, which is presented in the following section.

2.3. Post-adoption Research on Information System Continuous usage

The review of IS post-adoption literature revealed two different school of thoughts that have evolved over time (Islam, 2012). The first school of thought argues that post-adoption is an extension to IS adoption. This school of thought had used variables from IS adoption frameworks to predict and explain post-adoption behaviour of IS by extending the underlying models in a longitudinal setting (e.g. Karahanna et al., 1999; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis, & Davis, 2003). They investigated the underlying IS phenomena based on technology acceptance model (TAM) and its various extensions. In contrast to that, Bhattacherjee (2001b) argued that although IS users may form some initial judgement and beliefs about IS usage, but their initial judgement and beliefs are modified during their actual usage of the IS that subsequently determines users' IS continuous usage intention. Subsequently, Bhattacherjee (2001b) integrated expectation-confirmation theory (ECT) and TAM to add a new theoretical perspective to individual-level IS continuous usage researches and proposed a model called IS continuance model that solely and explicitly emphasizes on post-adoption beliefs and satisfaction. This new theoretical explanation evolved to produce second school of thought in IS post-adoption literature.

Over the last decade, several past researches have been conducted to develop a robust model of IS continuous usage by extending Bhattacherjee (2001b)'s post acceptance model of IS continuous usage. Various extended IS continuance models have been proposed by incorporating constructs from other theoretical frameworks. Figure 2.8 presents a bird's eye view of the constructs that were used to extend the IS continuance model. This extended IS continuance model is adapted and extended from Hong et al. (2008) by incorporating three additional categories and depicted in the dotted box. All constructs pertaining to IS continuous usage are categorized into following major nine (9) categories, each comprising a number of different constructs that were used to extend the IS continuance model: (1) behavioural-based beliefs consisting of utilitarian and affective beliefs, (2) behavioural attitude, (3) object-based beliefs, (4) control beliefs, (5) facilitating belief, (6) social factors, (7) previous behaviour, (8) behavioural intention, and (9) continued behaviour. Behavioural beliefs are related to the consequences of IS use in terms of utilitarian and affective beliefs, whereas behavioural attitude is formed as the result of general evaluation of the consequences or overall affective reaction after using an IS (Hong et al., 2008). Whereas, object-based beliefs are related to the characteristics of a particular IS and control beliefs are concerned with the factors that assist to enhance IS performance (Islam, 2012). Facilitating beliefs are concerned with the presence of factors that support the usage of a target system (Venkatesh & Davis, 2000). Social factors are related to individual's social network influences on performing the target behaviour (Islam, 2012). These factors related to these categories are shown in Figure 2.8.



Note: 1-Bhattacherjee (2001b), 2-Limayem, Hirt, and Cheung (2007), 3-Bhattacherjee, Perols, and Sanford (2008), 4-Kang, Hong, and Lee (2009), 5-Hsu, Chiu, and Ju (2004), 6-Lin, Wu, and Tsai (2005), 7-Lee (2010), 8-Larsen, Sørebø, and Sørebø (2009), 9-Liao, Chen, and Yen (2007), 10-Hong, Thong, and Tam (2006), 11-Thong et al. (2006), 12-Liao, Palvia, and Chen (2009), 13-Sørebø, Halvari, Gulli, and Kristiansen (2009), 14-Roca et al. (2006), 15-Limayem et al. (2007), 16-Hsieh and Wang (2007), 17-Islam (2012), 18-Zhao, Deng, and Zhou (2015), 19-Basak and Calisir (2015), 20-Ayanso, Herath, and O'Brien (2015), 21-Chang and Huang (2015), 22-Sun, Liu, Peng, Dong, and Barnes (2014), 23-Kim, Hong, Min, and Lee (2011), 24-Li, Troutt, Brandyberry, and Wang (2011), 25-Kamis et al. (2008).

*Indicates the constructs of original IS Continuance model proposed Bhattacherjee (2001).

**Indicates new constructs that were not present in the Hong et al. (2008).

Dotted boxes are new main constructs not present in Hong et al. (2008).

Figure 2.8: Extensions of IS Continuance model [adapted and extended from Hong et al. (2008)]

As shown in above Figure 2.8, a considerable number of past studies have used IS continuance model to investigate the post-adoption behaviour. These studies attempted to extend the IS continuance model by incorporating additional variables from different theoretical frameworks. For example, Limayem and Hirt (2003) and Cheung and Limayem (2005) explained IS continuous usage behaviour by incorporating constructs from theory of reasoned of action and theory of planed behaviour. Lin et al. (2005) extended the IS continuance model and asserted that users' intention to continue using web-portal is influenced by perceived playfulness, perceived usefulness, and satisfaction, whereas satisfaction is determined by perceived playfulness and confirmation. Hong et al. (2006) included perceived ease of use as an additional predictor of both satisfaction and mobile Internet continued use intention. Affective variables such as pleasure (Kim, Chan, & Gupta, 2007), perceived ease of use and perceived enjoyment (Thong et al., 2006) have been adopted to determine mobile Internet continued use intention. Wang (2008) included perceived value for explaining e-commerce continued use intention, whereas information quality, system quality, and service quality were also incorporated for explaining perceived value and satisfaction. Hsieh, Rai, and Keil (2008) used personal network exposure, attitude, and Internet ownership to explain Internet TV continuous usage intention. Shih (2008) incorporated perceived playfulness, compatibility, relative advantage, and complexity affect as antecedents of Internet continuous usage intention. Bhattacherjee et al. (2008) used satisfaction and IT self-efficacy to explain users' intention to continue using management information system, whereas continuous usage intention and IT self-efficacy used to predict continuous usage behaviour. Moreover, Kang et al. (2009) found that perceived usefulness, perceived ease of use, past use, self-image congruity, regret, and satisfaction were significant determinants of web-portal continued use intention, whereas satisfaction was predicted by perceived usefulness and perceived enjoyment. Kim (2010) added perceived enjoyment, social norms, perceived

behavioural control, and perceived fee to explain users' continuous usage of mobile data services. Lee (2010) found that satisfaction had the most significant effect on users' intention to continue using web-based learning program, followed by perceived usefulness, attitude, concentration, subjective norm, and perceived behavioural control. Whereas, Deng, Turner, Gehling, and Prince (2010) gave greater importance to perceived utilitarian performance, perceived hedonic performance, confirmation, and cognitive absorption for explaining satisfaction with mobile Internet. Islam (2012) included perceived system quality, perceived work compatibility and perceived support for predicting post-adoption satisfaction with e-learning system.

Furthermore, Kim et al. (2011) added additional variables based on IS success model such as system quality, information quality, service quality, and trust for explaining users' satisfaction and intention to continue using application services. Lin, Wu, Hsu, and Chou (2012) found that users' intention to continue using Internet protocol television was determined by perceived value, perceived benefits and satisfaction, whereas satisfaction is influenced by perceived benefits and confirmation. Zhou et al. (2014) added utilitarian, hedonic, and social benefits to explain satisfaction in IS continuance model. Sun et al. (2014) reported that online social network continuous usage intention was determined by perceived enjoyment, perceived usefulness, usage satisfaction, effort expectancy, social influence, tie strength, shared norms, and trust. Basak and Calisir (2015) found that Facebook continuous usage intention was predicted by attitude and satisfaction, and in turn satisfaction was influenced by entertainment, self-expression, information seeking, and status seeking. In addition to that, Chiu, Hsu, Lai, and Chang (2012) investigated the moderating role of habit on the relationship between trust and repeat purchase intention. They found that a higher level of habit reduces the effect of trust on repeat purchase intention. Additionally, value, satisfaction, and familiarity are important to habit

formation and thus relevant within the context of online repeat purchasing. Similarly, Zhao et al. (2015) found that habit significantly moderate the impact of library system qualities on users' continuance intention. Other studies (e.g. Khalifa & Liu, 2007) have also found that habit moderates the relationship between satisfactions and online repurchase intention. Last but not the least, several past studies incorporated a number of other determinants of continuous usage intention such as effective commitment (Jin, Lee, & Cheung, 2010), perceived relative advantage (Chang, 2015; Li et al., 2011), hedonic value (Chen, Meservy, & Gillenson, 2012), confirmed content (Terzis, Moridis, & Economides, 2013), perceived quality (Zhou et al., 2014), compatibility (Chang, 2015), and perceived risk (Ayanso et al., 2015). Table 2.10 and Table 2.11 present the findings of direct antecedents to continuous usage intention and satisfaction respectively.

Table 2.10: The Findings of Direct Relationship between Different Factors and IS Continuous Usage Intention

Reference	Theoretical Underpinning	Sample size and Target IS Application	Direct antecedents to Continuou Usage Intention	Results
Zhao et al. (2015)	IS continuance model, IS success model	396 users of mobile-library applications	Perceived usefulness Expectation confirmation Satisfaction System quality Information quality Service quality	Sig. + Sig. + Sig. + Sig. + Sig. + Sig. +
Basak and Calisir (2015)	IS continuance model	209 Facebook users	Attitude Satisfaction.	Sig. + Sig. +
Bøe, Gulbrandsen, and Sørebø (2015)	IS continuance model, Agency theory	177 users of ICT in higher education	Perceived usefulness Satisfaction	Sig. + Sig. +
Ayanso et al. (2015)	IS continuance model	135 users of electronic medical records	Satisfaction, Perceived usefulness Perceived risk	Sig. + Sig. + Sig. -
Sun et al. (2014)	IS continuance model, flow theory, social capital theory, and the UTAUT.	320 users of online social network	Perceived enjoyment Perceived usefulness Satisfaction Effort expectancy Social influence, Tie strenght, Shared norms Trust	Sig. + Sig. + Sig. + Sig. + Sig. + N/Sig. Sig. + Sig. +
Terzis et al. (2013)	IS continuance model	350 users of Computer Based Assessment	Confirmed ease of use Confirmed playfulness Confirmed content Confirmed usefulness	Sig. + Sig. + Sig. + Sig. +

Islam (2012)	IS continuance model, UTAUT	175 educators of e-learning system	Perceived ease of use Perceived behavioral control Perceived compatibility Social influence	N/Sig N/Sig N/Sig N/Sig
Lin et al. (2012)	ECT, Valued based adoption model	172 users of Internet protocol television	Perceived value Perceived benefits Satisfaction	N/Sig Sig. + Sig. +
Chen et al. (2012)	IS continuance model	147 users of information-oriented mobile application	Satisfaciton Hedonic value	Sig. + Sig. +
Kim et al. (2011)	IS continuance model	203 SEMs with application service experience	System Quality Information Quality Service Quality Satisfaction Trust	Sig. + Sig. + Sig. + Sig. + Sig. +
Kim (2010)	IS continuance model, TPB	207 users of mobile data service	Perceived usefulness Perceived enjoyment Social norms Satisfaction Perceived behavioral control Perceived fee	Sig. + Sig. + Sig. + Sig. + Sig. - N/Sig
Lee (2010)	ECT, TAM, TPB, Flow theory	363 learners of a Web-based learning program	Satisfaction Perceived usefulness Attitude Concentration Subjective norm Perceived behavior control	Sig. + Sig. + Sig. + Sig. + Sig. + Sig. +
Recker (2010)	IS continuance model	529 users of grammer modelling	Perceived ease of use perceived usefulness Satisfaction	N/Sig. Sig. + Sig. +
Kang et al. (2009)	IS continuance model	349 users of web-portal	Perceived usefulness Perceived ease of use Past use Self-image congruity Regret Satisfaction.	Sig. + N/Sig. Sig. + N/Sig. Sig. - Sig. +
Bhattacherjee et al. (2008)	IS continuance model	81 users of management system	Satisfaction IT self-efficacy	Sig. + Sig. +
Hsieh and Wang (2007)	IS continuance model, TAM	200 user of ERP	Perceived usefulness perceived ease of use Satisfaction Extended use	Sig. + Sig. + Sig. + Sig. +
Thong et al. (2006)	IS continuance model, TAM	811 users of mobile Internet	Perceived usefulness Perceived ease of use Pereived enjoyment Satisfaction	Sig. + Sig. + Sig. + Sig. +
Hong et al. (2006)	IS continuance model, TAM	1826 users of mobile internet	Perceived usefulness Perceived ease of use Satisfaction	Sig. + Sig. + Sig. +
Lin et al. (2005)	IS continuance model	254 users of web-portal	Perceived playfulness Percevied useuflness Stisfacition	Sig. + Sig. + Sig. +
Bhattacherjee (2001a)	IS Continuance model	172 e-commerce service users	Satisfaction Perceived usefulness	Sig. + Sig. +

Table 2.11: The Findings of Direct Relationship between Different Factors and Satisfaction

Source	Theoretical Underpinning	Sample size and Target IS Application	Direct antecedents to users' satisfaction	Results
Bøe et al. (2015)	IS continuance model, Agency theory	177 users of ICT in higher education	Perceived usefulness Perceived confiration	Sig. + Sig. +
Ayanso et al. (2015)	IS continuance model	135 users of electronic medical records	Percevied usefulness Perceived risk Perceived confirmation.	Sig. + Sig. - Sig. +
Zhou et al. (2014)	IS continuance model, Theory of benefits	464 users of social virtuual world	Utilitarian benefits Hedonic benefits Social benefits	Sig. + Sig. + Sig. +
Chen et al. (2012)	IS continuance model	147 users of mobile application	Perceived usefulness Perceived confirmation	Sig. + Sig. +
Islam (2012)	ECT	175 educators of e-learning system	Perceived confirmation Perceived system quality Perceived usefulness, Perceived work compatibility Perceived Result deomonstrability Perceived support.	Sig. + Sig. + Sig. + Sig. + N/Sig. Sig. +
Kim et al. (2011)	IS continuance model	203 SEMs with application service experience	System Quality Information Quality Service Quality	Sig. + Sig. + Sig. +
Lee (2010)	ECT, TAM, TPB), Flow theory, IS continuance model	363 learners of a Web-based learning program	Perceived usefulness Perceived confirmation	Sig. + Sig. +
Deng et al. (2010)	IS continuance model	289 users of mobile internet	Perceived utilitarian performance Perceived hedonic performance Perceived confirmation Perceived cognitive absorption	Sig. + Sig. + Sig. + Sig. +
Recker (2010)	IS continuance model	529 users of grammer modelling	Perceived usefulness Perceived ease of use Perceived confirmation Grammar familiarity	Sig. + Sig. + Sig. + Sig. +
Kang et al. (2009)	IS continuance model	349 users of web-portal	Perceived usefulness Perceived enjoyment	Sig. + Sig. +
Sørebø and Eikebrokk (2008)	IS continuance model	161 users of cash transaction system	Perceived usefulness Perceived ease of use Perceived confirmation	Sig. + Sig. + Sig. +
Thong et al. (2006)	IS continuance model, TAM	811 users of mobile Internet	Perceived usefulness Perceived ease of use Perceived enjoyment	Sig. + Sig. + Sig. +
Lin et al. (2005)	IS continuance model	254 users of web-portal	Perceived playfulness Perceived confirmation.	Sig. + Sig. +

Sig. +: Significant Positive Relationship, Sig. - : Significant Negative Relationship,
N/Sig.: Not Significant Relationship

Beside original TAM and its various extensions (i.e. TAM2, TAM3, UTAUT), several other theoretical models have been used to examine satisfaction and continuous usage intention for extending IS continuance model. For example, past IS researches used following theories or models: Flow theory (Liao, Huang, & Wang, 2015); Agency theory

(Bøe et al., 2015); Innovation Diffusion Theory (Shih, 2008); Expectation-Confirmation Theory (Hung & Hsu, 2013; Liao et al., 2015; Lin et al., 2012); Theory of Planed Behavior (Hsieh et al., 2008); Theory of Reasoned Action (Karahanna et al., 1999); Motivation theory (Liao et al., 2015); Commitment-Trust Theory (Vatanasombut, Igbaria, Stylianou, & Rodgers, 2008); Valued based adoption model (Lin et al., 2012); IS Success Model (Brown & Jayakody, 2008; Ifinedo, Rapp, Ifinedo, & Sundberg, 2010; Schaupp, 2010); UTAUT (Sun et al., 2014); Thinking Feelings Model (Kim et al., 2007); Theory of belief updating (Kim & Malhotra, 2005); and the self-developed models that were developed by taking different constructs from various theoretical perspectives (Garrity, Glassberg, Kim, Sanders, & Shin, 2005; Kang & Lee, 2010; Kuan, Bock, & Vathanophas, 2008; Lee, Yoon, & Lee, 2009; Li et al., 2011; Park, Kim, & Koh, 2010).

After discussing the various antecedent factors pertaining to adoption and post-adoption of IS usage, next step is to review the most relevant theories and models that have been used in past studies for investigating the target IS adoption phenomena. Review on these theories and models is presented in the next section.

2.4. Theories and Models Used in the Prior Literature

Research on technology usage and adoption has a long tradition in the area of information technology (Davis, 1989; Zmud, 1979). Over the time, a number of theories and models have been developed to investigate the technology adoption and post-adoption phenomena. For example, Expectation Confirmation Theory (Oliver, 1980), Technology Acceptance Model (TAM) (Davis, 1989), TAM2 (Venkatesh and Davis, 2000), TAM3 (Venkatesh and Bala, 2008), Unified Theory of Acceptance and Use of Technology

(UTAUT) (Venkatesh et al., 2003), Effort-Accuracy Model (Payne et al., 1993), Theories of Trust Formation (Benbasat & Wang, 2005; Gefen et al., 2003; Komiak & Benbasat, 2008), and IS Continuance model (Bhattacherjee, 2001b). These theoretical models have differences in terms of their focus and are developed to examine the initial or continued usage of the target technology. Moreover, they have been extensively used by several past studies to investigate underlying factors and to provide reasoning in adopting or continue using the target technology. The selection of theoretical model as a guiding theory to conduct research depends on the underlying purpose and context of study. In align with research questions of this study, the researcher reviewed the most relevant theories and models that have been used in various past researches. These theories and models are discussed in detail in the following subsections.

2.4.1. IS Continuance Model

Bhattacherjee (2001b) developed IS continuance model by integrating expectation-confirmation theory (ECT) and technology acceptance model (TAM) based on the congruence between individuals' IS continuous usage decisions and re-purchase decisions. The ECT has been used in the context of consumer behavior to examine satisfaction and re-purchase decision (Churchill & Surprenant, 1982; Oliver, 1993). The ECT hypothesizes that a consumer's level of satisfaction with a product determines re-purchase intention. Whereas satisfaction level is determined by his/her pre-purchase expectations on product performance, and discrepancies between expectations and product performance (i.e. disconfirmation). The expectation-confirmation is attained when the product performs as much as expected: positively confirmed when the product performs better than expected; and negatively confirmed when the product performs worse than expected (Churchill & Surprenant, 1982). Similarly, IS continuance model

asserts that an individual's IS continuous usage intention is dependent on the following three variables: (i) the user's level of satisfaction with IS, (ii) the extent of user's confirmation of expectations, and (iii) post-adoption expectations in the form of perceived usefulness.

The IS continuance model resembles TAM on two perspectives: (1) it includes users' cognitive beliefs in predicting and explaining IS continuous usage intention, and (2) it explains the causality relationship of belief-affect-intention (Bhattacherjee, 2001b). Conversely, IS continuance model is different from TAM in the following four unique perspectives (Bhattacherjee, 2001b): ***First,*** it predicts and explains users' behaviour of IS continued use, whereas TAM focuses and explains the initial IS acceptance. Conceptually, initial acceptance and continuous usage intention are two different stages of IS adoption process. It highlights the importance of post-adoption expectations rather than pre-adoption expectations. An individual keeps updating expectations towards using a target system as he/she gains more experiences from using it. After assimilation of these experiences, an individual's expectations toward using the system could be very different from the initial expectations before using it (Bhattacherjee, 2001b). Therefore, Bhattacherjee (2001b) argued that the post-adoption expectations are the relevant factors of individual's level of satisfaction towards IS coontinuous usage. ***Second,*** the IS continuance model adopted perceived usefulness from TAM to be the surrogate for post-adoption expectation that is a salient cognitive belief in IS use (Davis, 1989), and consistent with the definition of expectation in the ECT as individual belief (B) or sum of beliefs (ΣBi) (Oliver, 1980). In addition to that, perceived usefulness is an appropriate expectation in the context of IS continuous usage, because it is the only cognitive belief which is consistently influencing user's intention over different stages of IS adoption (Bhattacherjee, 2001b; Davis, 1989). ***Third,*** the IS continuance model did not adopted

the performance variable, as it presumes that the impact of performance is already captured within confirmation and satisfaction variables (Bhattacherjee, 2001b). These variables are more likely to better explain and predict continuous usage behaviour. Furthermore, the exclusion of performance variable from the IS continuance model suggests that the effect of performance is mediated by confirmation variable (Yi & Zeithaml, 1990). ***Fourth,*** it provides an adequate explanation of IS acceptance-discontinuous usage anomaly by explaining causality relationship of disconfirmation-dissatisfaction with IS use which subsequently leads to IS discontinuous usage (Bhattacherjee, 2001b).

Furthermore, IS continuous usage decision is similar to product repurchase decision in the following two perspectives based on ECT (Bhattacherjee, 2001b). First, both decisions follow initial acceptance or initial purchase decision. Second, initial acceptance or purchase decison influences continuous usage or repurchase decisions. Therefore, before making a final choice, rational IS users or product buyers will more likely to follow a decision process similar to that explained in the ECT. Whereas, the main focus of IS continuance model is on IS post-adoption factors (Bhattacherjee, 2001b). It is because that the impact of IS pre-adoption factors is captured within the factors of perceived confirmation and satisfaction (Bhattacherjee, 2001b). Moreover, in contrast to the ECT which only investigates the influence of pre-consumption expectation, the IS continuance model examines the post-consumption expectation that is particularly critical for products or services where expectation may vary over time, as it often happens with the IS use (Bhattacherjee, 2001b). The IS continuance model is depicted in Figure 2.9 and the definitions of the key constructs are presented in Table 2.12.

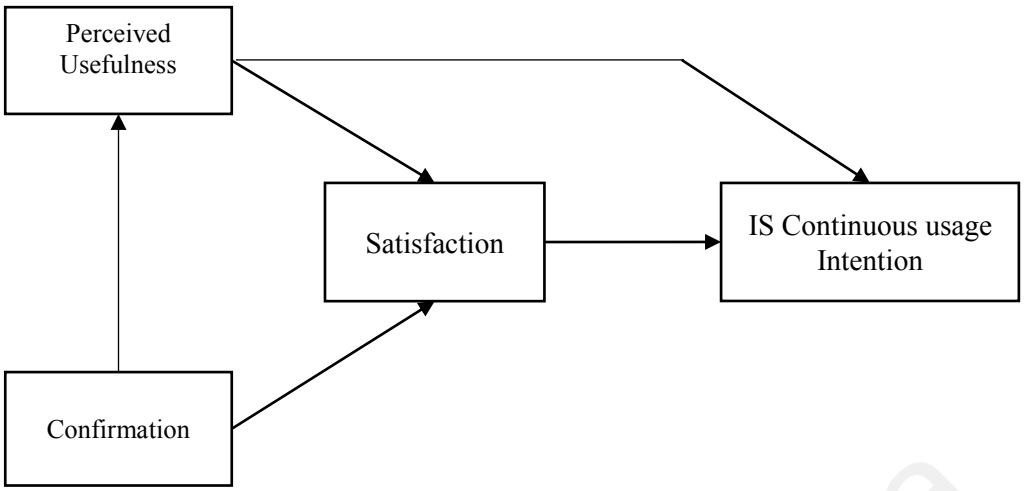


Figure 2.9: IS Continuance Model (Bhattacherjee, 2001b)

Table 2.12: Definition of the Constructs of IS Continuance Model

Constructs	**Definition**
IS Continued use intention	Users' intention to continue using the IS (Bhattacherjee, 2001, p. 359).
Satisfaction	Users' affect with (feelings about) prior IS Use (Bhattacherjee, 2001b).
Perceived Usefulness	Users' perception of the expected benefits of IS use (Bhattacherjee, 2001, p. 359).
Confirmation	Users' perception of the congruence between expectation of IS use and its actual performance (Bhattacherjee, 2001b, p. 359).

According to Bhattacherjee (2001b), users' satisfaction with IS determine their IS continuous usage intention. Satisfaction is defined as "users' affect with (feelings about) prior IS use" (Bhattacherjee, 2001b). Past studies in marketing (Oliver, 1993; Szymanski & Henard, 2001) have found that consumers' satisfaction level is the major reason to repurchase products or patronize the services. Owing to the similarity between re-purchasing product and continuing an IS, the IS continuance model asserts an equivalent relationship in the context of IS continuous usage. Furthermore, satisfaction is influenced by two cognitive beliefs of the individuals: confirmation of expectations and perceived usefulness (post-adoption expectation).

Individuals' confirmation of expectations suggests that they have obtained expected benefits by experiencing the IS that leads to a positive impact on their satisfaction with the IS usage. In contrast to that, individuals' failure in confirmation of expectations for obtaining expected benefits leads to negative effect on their satisfaction with the IS usage. This relationship is originally explained in the ECT-based studies (e.g. Lin et al., 2005; Oliver, 1980, 1981; Oliver & DeSarbo, 1988; Prakash, 1984; Swan & Trawick, 1981), where satisfaction is separately influenced by expectation and confirmation after actual use of IS. These studies explain that users' expectations provide the foundation for the confirmation evaluated by users in order to determine their satisfaction level. The IS continuance model also asserts that individuals' confirmation of expectations has positive impact on their perception of usefulness with the IS usage. Because it could be adjusted by confirmation experience, especially when individuals' initial perception of IS usefulness is not concrete due to the uncertainty over what to expect from the IS usage (Bhattacherjee, 2001b). Moreover, positive confirmation elevates individuals' perception of usefulness and negative confirmation deteriorate this perception (Bhattacherjee, 2001b).

Bhattacherjee (2001b) argued that perceived usefulness is the only salient factor which influences attitude substantively and consistently during both stages of IS pre- and post-acceptance. In align with cognitive dissonance theory (Festinger, 1962) and the expectancy-confirmation paradigm, Bhattacherjee (2001b) theorized and validated perceived usefulness as a post-adoption expectation which positively influences satisfaction with IS by serving as a benchmark for reference against confirmation judgments. This relationship is also reinforced by the adaptation level theory (Helson, 1964) which asserts that individuals perceive stimuli only in relation to an adapted level (Yi & Zeithaml, 1990). It is also reported in prior marketing studies (e.g. Oliver &

DeSarbo, 1988) that the higher the individuals' expectations, the higher are their level of satisfaction.

To sum up it up, IS continuance model has been extensively applied to investigate continuous usage behavior in different technological contexts such as online banking (Bhattacherjee, 2001b; Vatanasombut et al., 2008), e-commerce (Cenfetelli, Benbasat, & Al-Natour, 2008; Hsu et al., 2004; Lin et al., 2005), mobile Internet usage (Hong et al., 2006; Thong et al., 2006), Internet usage (Limayem et al., 2007), virtual communities (Chen, 2007), e-government (Bhattacherjee et al., 2008), and e-learning (Chiu, Hsu, Sun, Lin, & Sun, 2005; Islam, 2012; Lee, 2010; Liao et al., 2009; Limayem & Cheung, 2011; Sørebø et al., 2009). Table 2.13 presents frequency of past studies evaluating different IS applications.

Since IS continuance model has been widely used to examine post-adoption behavior in various technological contexts, it seems reasonable to use the IS contiuance model as a theoretical underpinning of this study. It implies that IS continuous usage intention is the main dependent variable in this study. The IS continuance model asserts that continuous usage intention is predicted by satisfaction and perceived usefulness. The Incorporation of only one post-adoption belief (i.e. percieved usefulness) has been argued to be one of the major limitations of the IS continuance model (Hong et al., 2006). Therefore, others factors such as perceived decision effort and decision quality based on effort-accuracy framework as additional direct antecedent factors of consumers' OPR continuous usage intention can be considered.

Table 2.13: Frequency of Past Studies Evaluating Different IS Applications

IS Applications	Count	Source
Mobile Application: library, data services, Internet	8	(Chen et al., 2012; Deng et al., 2010; Hong et al., 2006; Kim, 2010; Kim, Chan, Chan, & Gupta, 2004; Kim et al., 2007; Thong et al., 2006; Zhao et al., 2015)
e-Learning System	8	(Chang & Huang, 2015; Cheung & Limayem, 2005; Chiu et al., 2005; Lee, 2010; Liao et al., 2009; Liao et al., 2015; Limayem & Cheung, 2011; Sørebø et al., 2009)
e-Commerce Web-portal/ Web-portal	8	(Bhattacherjee, 2001a; Cenfetelli et al., 2008; Hong, Kim, & Lee, 2008; Hsu, Yen, Chiu, & Chang, 2006; Hung & Hsu, 2013; Kang et al., 2009; Kim & Malhotra, 2005; Lin et al., 2005)
Social Virtual World/ Facebook	4	(Basak & Calisir, 2015; Jin et al., 2010; Sun et al., 2014; Zhou et al., 2014)
Human Resource System/ Management System	2	(Bhattacherjee et al., 2008; Venkatesh & Goyal, 2010)
Internet Protocol Television	2	(Hsieh et al., 2008; Lin et al., 2012)
Internet Application	2	(Kim et al., 2011; Limayem et al., 2007)
e-government	2	(Bhattacherjee et al., 2008; Venkatesh, Thong, Chan, Hu, & Brown, 2011)
Online Banking	2	(Bhattacherjee, 2001b; Vatanasombut et al., 2008)
Cash Transaction System	1	(Sørebø & Eikebrokk, 2008)
Decision Support System	1	(Kamis et al., 2008)
Information Communication Technology	1	(Bøe et al., 2015)
e-Services	1	(Chea & Luo, 2008)
Electronic Resource Plaining System	1	(Hsieh & Wang, 2007)
Training Software	1	(Bhattacherjee & Premkumar, 2004)

The next sections present a review of human information theory, particularly effort accuracy framework.

2.4.2. Human Information Processing Theory

Human information processing theory (Payne, 1982; Payne, Bettman, & Johnson, 1988) asserts that it is not feasible for human to evaluate all available information before making a final choice due to their limited cognitive capacity. Therefore, they seek to attain a satisfactory level of achievement (Simon, 1955). In the context of online shopping environment, a large amount of product information is available and customers are required to process ever-increasing information with the same limited cognitive capacity in order to decide which product to buy (West et al., 1999). Information processing theory suggests to follow a two-stage information processing strategy in order to minimize the informational overload and complexity of decision making. At the first stage of screening alternatives, consumers search through a large set of available alternatives, acquire detailed information on the alternatives, and identify a subset (i.e. the consideration set) of the most promising products. At second stage, consumers perform an in-depth comparative evaluation of selected alternatives (Payne, 1982; Payne et al., 1988). This two stage information processing strategy assists online customers to attain a satisfactory level based on the trade-off between the desire to reduce cognitive effort and the desire to make an accurate decision.

Since OPRs facilitate both initial screening of available alternatives and in-depth comparison of product alternatives within the consideration set, they can provide support to consumers in both stages of the decision-making process (Xiao & Benbasat, 2007). Consistent with this view, consumers' perception of decision effort and decision quality are considered important factors in accepting and adopting an e-commerce technology (Xu et al 2014). Moreover, both of these two factors (decision effort and quality) are align with the two central components of the effort–accuracy framework (Payne et al., 1993).

2.4.2.1. Effort-Accuracy Framework

The essence of the effort-accuracy framework is that a decision maker's primary objective is to enhance decision quality and to reduce decision effort exerted in decision making process (Payne, 1982; Payne et al., 1993). Payne et al. (1993) epitomized the effort-accuracy framework based on the idea that customers have a number of strategies in decision making and which strategy is selected depends on the compromise between customers' desire to enhance decision quality and the desire to minimize decision effort exerted. Moreover, the trade-off between decision effort and accuracy also differs across decision strategies, decision environment, and decision tasks (Bettman, Luce, & Payne, 1998). Thus, the individuals have to trade-off between decision effort and decision accuracy in order to achieve a satisfactory level. In the context of e-commerce, e-retailers provide a number of different online decision support aid (e.g. OPR) which help to cope with the information overload by performing resource-intensive information processing tasks, consequently freeing up some of customers' cognitive capacity for effective decision making (Häubl & Trifts, 2000; Senecal & Nantel, 2004).

In the decision support system (DSS) context, several past studies (Fasolo et al., 2005; Häubl et al., 2004; Häubl & Murray, 2003; Häubl & Trifts, 2000; Hostler et al., 2005; Schafer et al., 2002; Xiao & Benbasat, 2007; Xu et al., 2014) have applied the effort-accuracy model to examine the influence of decision aid on decision accuracy and effort, and reported mix findings. For example, Benbasat and Todd (1996) reported that customers use OPR to conserve cognitive effort, not certainly to increase their decision quality (accuracy). Schafer et al. (2002) and Fasolo et al. (2005) demonstrated that OPRs not only enhance decision quality, but also increase the decision effort. Xu et al. (2014) conducted a study on the effectiveness of trade-off transparency feature of system

recommenders and reported that decision effort and decision quality are two important consumers' responses for measuring OPR's performance.

In addition to decision effort and decision quality variables, past IS studies (e.g. Griffiths, Johnson, & Hartley, 2007; Sharabati, 2014) have also established that satisfaction is a valid non-financial measure of system performance and usage commitment. Satisfaction has been found a consistent significant determinant of users' continuance intention and long-term success of new technologies (Premkumar & Bhattacherjee, 2008; Rogers, 2010; Thong, et al., 2006; Lee, 2010). It plays a critical role in evaluating system success in voluntary contexts (Hou, 2012), as it is the case in OPR. An effective OPR, but recognised by consumers as ineffective, is in fact an unsatisfactory OPR. Therefore, from consumers' perspective, decision effort, decision quality, and satisfaction can be considered key dimensions of OPR performance that subsequently influence consumers' behavioral intention. Additionally, past studies (e.g. Häubl & Murray, 2006; Xiao & Benbasat, 2007; Xu et al., 2014) also separately reported that the decision effort, decision quality, and satisfaction are the premier factors that determine the success rate of OPR. According to the effort-accuracy model and IS continuance model, the three dimensions of performance are also directly related to users' behavioral intention. It is implied that if consumers perceive that the OPR helps reducing decision effort and increasing decision quality, then they would more likely continue OPR use for future purchase. Otherwise, consumers may stop using OPR and start relying on their own capability rather on OPR. Similarly, consumer satisfaction with OPR is also positively related to OPR continuance intention. The theoretical integration of effort-accuracy model and IS continuance model suggests to employ OPR performance as second-order construct consisting of three dimensions: decision effort, decision quality, and satisfaction.

2.4.3. Theories of Trust Formation

Trust in social construction originates from interpersonal relationships (Sztompka, 1999) and trust targeted in most past studies is trust on humans (Wang & Benbasat, 2008). Trust from social perspective is defined as a personal trait. According to Rotter (1967), trust refers to "an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon". As an extension to interpersonal trust, several past studies (e.g. Reeves and Nass, 1997; Sztompka, 1999; Jian, Bisantz, and Drury, 2000; Komiak and Benbasat, 2006) also supported the importance of trust formation in technological artifacts. For example, Reeves and Nass (1997) conducted an empirical study and argued that people treat computers as social actors and apply social rules to them. They further reported that technologically-sophisticated people treat technological artifacts as if they were human beings, rather than simple tools. Sztompka (1999) has conceptually argued that trust in human and technology are not fundamentally different, because behind all human-made technologies are people who design and operate them. People considers technological artifacts as social actors, and assign personalities (e.g. friendliness, helpfulness) to them. The social responses are applied to both computer systems with simple text interfaces (Sztompka, 1999) and sophisticated conversational computer agents (Cassell & Bickmore, 2000). Moreover, it is found in the past literature that there is no significant difference between components of trust in humans and those in technological artifacts. As Jian, Bisantz, and Drury (2000) conducted an empirical study to examine the differences among human-human trust, trust in human-machine relationships, and trust in general, they found that components of trust are similar across these three types of trust.

Past researches on information system (McKnight, Choudhury, & Kacmar, 2002a; McKnight, Cummings, & Chervany, 1998) have used the theory of reasoned action to categorize three general types of trust: (1) trusting belief (the trustor's perceptions that the trustee is beneficial to the trustor), (2) trusting intention (the trustor's willingness to depend on a trustee in a given situation), and (3) disposition to trust (the extent to which a person displays a tendency to depend on others across a broad spectrum of situations and persons). Majority of the IS researches (e.g. Gefen et al., 2003; Komiak & Benbasat, 2006; Komiak & Benbasat, 2004; McKnight et al., 2002a; Wang, 2005; Wang & Benbasat, 2007, 2008) have defined trust as trusting beliefs. Trusting beliefs refer to one's perceptions about competence, benevolence, and integrity of the technology (Komiak & Benbasat, 2006).

In the context of OPR, according to McKnight et al. (2002a) and Wang and Benbasat (2007), competence belief refers to consumer's perception that the recommender systems have the skills and expertise to perform effectively in specific domains, benevolence belief refers to the consumer's belief that the recommender systems care about him or her and acts in his or her interest, and integrity belief is the perception that the recommender systems adheres to a set of principles (e.g. honesty) that are accepted by consumers. The trusting belief is consistent with the concept of cognitive trust which refers to "*a trustor's rational expectations that a trustee will have the necessary attributes to be relied upon*" (Komiak & Benbasat, 2004). According to Komiak and Benbasat (2006), cognitive trust is derived from the theoretical perspective of viewing trust as a trustor's rational choice, a perspective that is rooted in sociological (Coleman, 1990), economic (Williamson, 1993), and political (Hardin, 2002) theories.

In addition to cognitive trust, a few studies also have focused on emotional perspective of the trusting belief (Komiak & Benbasat, 2004). Komiak and Benbasat (2004) defined emotional trust as "*the extent to which one feels secure and comfortable about relying on the trustee*". Emotional perspective of trusting belief is also important in its respective impact mechanisms (Komiak & Benbasat, 2004). Because, without emotional trust, cognitive trust is insufficient to examine how a customer actually makes decisions about whether to trust or not in online recommendations (Komiak & Benbasat, 2006) due to following reasons: (1), individuals' experience have both cognitive and emotional perspectives. However, customer's emotional trust is also required to be considered, (2) OPR's continuous usage might not be purely based on the customers' cognition, because OPR users are not only online customers, but they are also IS users, (3) when OPR becomes personalized, then its continuous usage is not solely based on consumers' cognitive aspect, (4) the customer's rational choice may overstate his or her cognitive capacity (March, 1994), and (5) this rational choice usually plays a little role in generating social and emotional impact on trust decisions (Kramer, 1999). Thus, emotional trust can be either rational or irrational, because people go beyond the available evidence to feel assured and comfortable about relying on the trustee (Komiak & Benbasat, 2004; 2006).

Review of OPR literature showed that most past studies focus on cognitive trust as compared to emotional perspective of the trusting belief. A few studies have also used both cognitive and emotional perspectives of trust. For example, Komiak and Benbasat (2006) conceptualize customers' trusting belief as a combination of cognitive trust and emotional trust, based on the assumption that trust decisions generally involve both reasoning and feeling. Moreover, in various consumption situations, especially in B2C e-commerce context, customers' affective reaction is more critical to generate influence on their product choices due to two reasons: consumers' inability to touch or experience the

product before actual buying (Jiang & Benbasat, 2004; Komiak & Benbasat, 2004; Xiao & Benbasat, 2007) and no face-to-face personal interaction with e-retailers (Komiak & Benbasat, 2006). In this uncertain environment, customers' product choice become less cognitive and more affective (Komiak & Benbasat, 2006).

Furthermore, the cognitive and emotional trust focused lens is consistent with the theory of reasoned action (Fishbein & Ajzen, 1975) and cognition-affect-intention framework (Cohen & Areni, 1991; Thompson & Fine, 1999). Prior studies on information system have addressed the importance of trust in online environments and found trust as a key determinant of IS acceptance (Benlian & Hess, 2011; Gefen et al., 2003; McKnight, Choudhury, & Kacmar, 2002b; Pavlou, 2003). Specifically in the context of OPR, trusting belief in e-commerce vendors and OPR has important direct and indirect (e.g. via perceived usefulness, perceived risk, or satisfaction) effect on OPR adoption (Benlian et al., 2012; Komiak & Benbasat, 2006; Wang, 2005; Wang & Benbasat, 2007, 2008). When customers form preliminary trust on OPR, their perception of information quality presented in OPR contribute to their cognitive and emotional evaluation of the OPR's truthfulness (Komiak & Benbasat, 2006). The customers make inferences about trustworthiness of OPR by evaluating its explanatory information. Furthermore, customers' belief in OPR's trustworthiness is improved when explanatory information is in the form of how, why, and attribute trade-off explanation which is cognitively justified and discloses its underlying reasoning process (Benlian et al., 2012; Xiao & Benbasat, 2007).

In addition to explanatory information of OPR, other related characteristics such as source credibility of OPR also influence the customers' trusting belief, especially those customers who have limited knowledge of the recommended product (Benlian et al.,

2012). Customers are more willing to trust and accept the information when it is from a highly credible source as compare to less credible source (Benlian et al., 2012; Smith, Menon, & Sivakumar, 2005). For example, recommendations from consumer reviews are considered trustworthy because they are generated by their fellow consumers who have similar interest and have used the product in real setting (Benlian et al., 2012). In contrast to that, the system recommendations are generated by e-retailers based on various IT techniques, these retailers are perceived to have vested interest of increasing sales by promoting the products (Cheong & Morrison, 2008). Moreover, a retailer's recommendation gives a sense or feeling of deceptive manipulation, because the recommendation always contain positive or one-sided information (Benlian et al., 2012). Contradictorily, the consumer reviews that contain positive, negative or both or neutral information about product recommendations and presents a complete information is considered more credible and trustworthy (Cheung et al., 2009). To be effective, the OPR must be trusted (Urban, Sultan, & Qualls, 2000). Consumers usually form trusting belief whether OPR has the expertise to provide effective recommendations (i.e. is competent), or it cares about them and acts in their interest (i.e. benevolence), or it is designed to "push" the products of a certain manufacturer (i.e. has integrity). Therefore, trust formation theory recommends to employ trusting belief in OPR as a second-order formative construct consisting of three dimensions: competence trust, benevolence trust, and integrity trust.

The next section presents flow theory.

2.4.4. Flow Theory

Flow is defined as ‘‘the holistic sensation that individual feel when they act with total involvement” (Csikszentmihalyi, Larson, & Prescott, 1977). When people are in the state of flow, they become absorbed in their activities and unable to realize the changes in their surroundings. Particularly, they lose self-consciousness, concentrating only on the ongoing activity, and they feel that they have control over their environment (Csikszentmihalyi et al., 1977). Initially, this concept has been extensively applied in various researches in a broad range of contexts, such as sports, shopping, and gaming (Csikszentmihalyi et al., 1977). The flow theory is developed, deep-rooted in psychology, and has been used to address optimal user experiences with personal computers (Finneran & Zhang, 2005). From a motivation perspective, individuals make an effort to use an information technology because of intrinsic and extrinsic reasons (Davis et al., 1992). Extrinsic motivation refers to the desire to perform an activity because it is perceived to lead to distinct and valued outcomes. Intrinsic motivation refers to the desire to engage in an activity for no other reason than the process of performing it (Deci & Ryan, 1985; Teo, Lim, & Lai, 1999). Compared to perceived usefulness, which deals with users’ extrinsic motivation (Davis et al., 1992; Venkatesh et al., 2003), flow experience can be seen as an intrinsic motivation (Koufaris, 2002; Lee, 2010).

Over the decade, several researches (e.g. Koufaris, 2002; Lee, 2010; Thong et al., 2006) on information system (IS) have applied various dimensions (e.g. enjoyment, concentration) of flow concept to investigate IS adoption. For example, Ghani, Supnick, and Rooney (1991) measured flow using two constructs: enjoyment and concentration. Moon and Kim (2001) emphasized on three dimensions of flow: perceived enjoyment, concentration, and curiosity. Koufaris (2002) also developed three constructs to address

flow: perceived enjoyment, perceived control, and concentration. Whereas, Huang (2003) included four constructs to examine flow: curiosity, control, intrinsic interest, and attention focus. Li, Browne, and Wetherbe (2006) also examined the flow experience by including four constructs: focused attention, control, curiosity and temporal dissociation. Kim et al. (2008) measured the flow by focusing on its enjoyment dimension. Lu, Zhou, and Wang (2009) included perceived enjoyment, concentration, and perceived control to measure the impact of flow on behavioral intention. Lee (2010) used two constructs to address the flow: perceived enjoyment and concentration.

Literature review revealed that majority of past studies have use perceived enjoyment to address the impact of flow. According to Venkatesh (2000), perceived enjoyment refers to "the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use". Perceived enjoyment as an intrinsic motivation has shown a significant antecedent of technology acceptance (Koufaris, 2002; Lee, 2010; Thong et al., 2006). Usage of technology can bring fun and pleasure, and users will be intrinsically motivated to continue using it after its initial adoption. Thus, the flow theory helps to capture the elements of intrinsic motivation related to fun and pleasure using a technology (Koufaris, 2002). However, the current study focuses on perceived enjoyment dimension of flow to capture intrinsic or hedonic motivation with regards to continuous usage of OPR.

Based on the theoretical models discussed above, the current study provides a detailed discussion on the factors pertaining to consumers' OPR continuous usage intention. The following section presents the discussion on these factors.

2.5. Factors Pertaining to OPR Continuous Usage Intention

This section aims to provide a detailed discussion on the factors belong to four theoretical models (i.e. IS continuance model, effort-accuracy model, trust formation theory, and flow theory) in the study context of OPR continuous usage at consumer level. These factors represent to five OPR evaluation beliefs (i.e. ease of use, usefulness, confirmation, trust, and enjoyment) and three dimensions of OPR performance (i.e. satisfaction, decision effort, and decision quality) influencing consumers' intention to continue OPR use for future purchase. As shown in Figure 2.10, evaluation factors represent three pillars of consumers' instrumental beliefs (i.e. ease of use, usefulness), social-psychological beliefs (i.e. expectation-confirmation, trust), and affective belief (i.e. enjoyment) providing foundation to their perception of OPR performance in terms of satisfaction, decision effort, and decision quality, which subsequently determine their behavioural response towards OPR continuous usage. The OPR evaluation factors refer to consumers' perception of measuring characteristics, information, and honesty of the OPR (Baum & Spann, 2014; Benlian et al., 2012). Based on the literature review, it is argued that the OPR evaluation factors are suitable to develop consumers' positive perception of OPR performance, when they perceive that the OPR is easy to use, useful, trustworthy, enjoyable, and fulfil their expectations. Subsequently consumers' perceived OPR performance in terms of reduced decision effort and greater decision quality and satisfaction would more likely leads to OPR continuous usage for future purchase. Before providing a detailed discussion on each factor of OPR evaluation and OPR performance, how three pillars of OPR evaluation factors are related to the three dimensions of OPR performance that subsequently determine OPR continuous usage in the light of past studies is discussed in the following paragraphs.

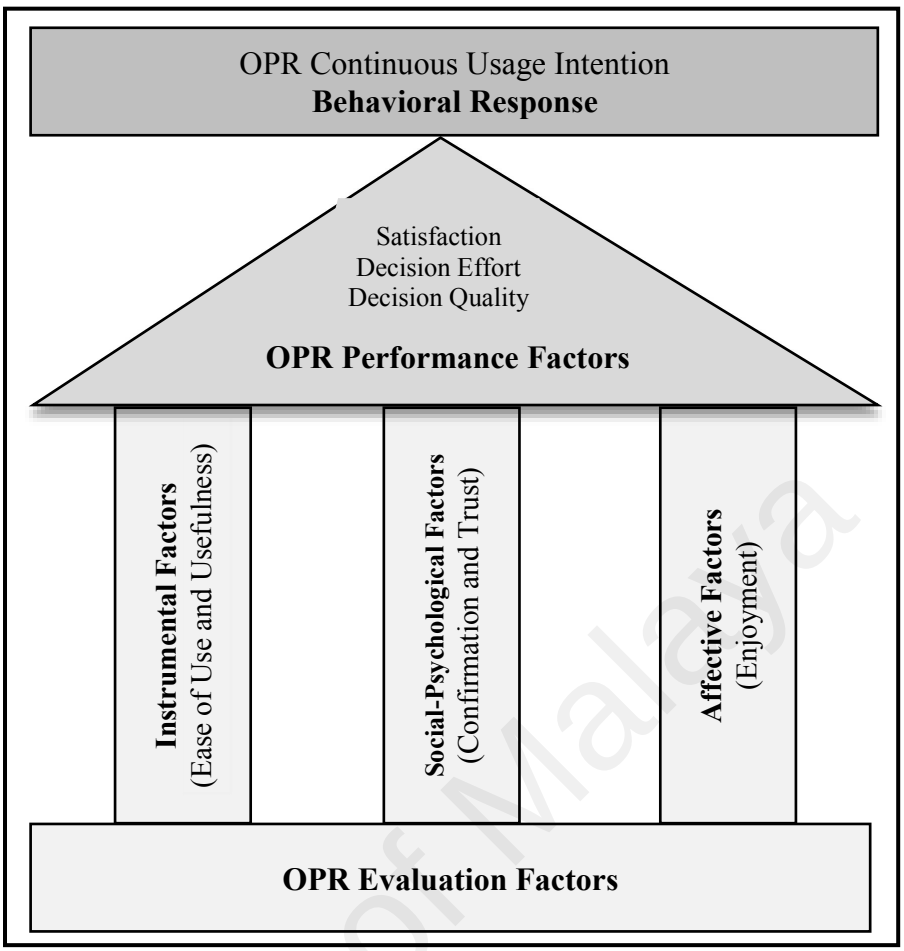


Figure 2.10. Foundation of Consumers' Perception of OPR Performance and Behavioral Response towards OPR Continuous Usage

Regarding the first pillar of instrumental factors, Benlian et al. (2012) reported that perceived ease of use and perceived usefulness play instrumental role in the evaluation of OPR and determining consumers' intention to reuse OPR. Similarly, Huang et al. (2013) reported that perceived ease of comprehension has an impact on the customers' decision making process. In the context of IS adoption, several past studies (e.g. Lee, 2010; Thong et al., 2006) have found that perceived ease of use and perceived usefulness significantly predict users' satisfaction and continuous intention. Venkatesh (2000) and Venkatesh and Davis (2000) found that the perceived usefulness of DSS influence the users' output quality and satisfaction. Raghunathan (1999) also reported that customers' perception of usefulness in information quality positively influences their decision quality.

Concerning the second pillar of social-psychological factors; expectation-confirmation and trusting belief have been extensively applied in various domains of IS researches (e.g. Benbasat & Wang, 2005; Fang et al., 2014; Lee, 2010; McKinney, Yoon, & Zahedi, 2002; Thong et al., 2006). For example, Thong et al. (2006) and Lee (2010) found that perceived confirmation positively influences satisfaction. Kim et al. (2009) investigated the relationship between trust and satisfaction, and reported that trust has indirect impact on customer's e-loyalty through satisfaction. Moreover, if consumers trust that the recommender system is expert, honest, and unbiased in recommending the products that match their preferences, then it will most likely influence consumers' perception of decision effort, decision quality, and satisfaction with the OPR.

Regarding the third pillar of affective OPR evaluation factors, Xu et al. (2014) found that perceived enjoyment negatively influences the perceived decision effort and positively affect the perceived decision quality. However, the researcher inferred that OPR evaluation factors provide sufficient foundation for determining consumers' perceived OPR performance in terms of decision effort, decision quality, and satisfaction.

Furthermore, from consumers' perspective, decision effort, decision quality, and satisfaction are the key factors that determine their behavioural response towards OPR continuous usage. In literature, several researchers (e.g. Häubl & Murray, 2006; Xiao & Benbasat, 2007; Xu et al., 2014) separately reported that the decision effort, decision quality, and satisfaction are the premier factors that determine the success or failure of OPR. These studies highlighted that a typical decision maker often faces two objectives: to maximize accuracy (decision quality) and to minimize effort (decision effort). In order to conserve the decision effort and improve decision quality, consumers use OPR to

facilitate their buying decision. The consumers believe that OPR usage reduces decision effort and improves buying decision quality, are driving forces in determining the OPR continuous usage (Xu et al., 2014). If the consumers perceive that the OPR do not facilitate in decreasing decision effort and increasing decision quality, then they would more likely rely on their own capability rather on OPR and subsequently may stop using OPR. Similarly, several past studies (e.g. Bhattacherjee, 2001b; Lee, 2010; Thong et al., 2006; Tsai & Chuang, 2011) have highlighted that satisfaction is a key determinant of IS continuance intention. If consumers are unsatisfied with OPR, then they more likely to discontinue using OPR. However, it is concluded that consumers' perceived OPR performance in terms of decision effort, decision quality, and satisfaction play important role in determining their OPR continuous usage intention.

The following subsections will present a detail theoretical explanations of these factors.

2.5.1. Instrumental Beliefs

In the past IS literature particularly TAM based studies (e.g. Chin & Todd, 1995; Davis, 1989; Venkatesh, 2000), two factors such as perceived ease of use and perceived usefulness have been consistently considered instrumental beliefs of IS users. Additionally, past studies (Hong et al., 2008; Lee, 2010; Thong et al., 2006) conducted using IS continuance model as base theory have also used perceived ease of use and perceived usefulness as instrumental factors in predicting individuals' IS continuous usage intention. The significance of these instrumental factors in understanding the OPR post-adoption phenomena is presented in detail in the following sub-sections.

2.5.1.1. Perceived Ease of Use

Huang et al., (2013) reported that a person considers a piece of information diagnostic, when it is easy to comprehend and leads to an effective decision making. It assists the customers in evaluating the product attributes (Benlian et al., 2012). The evaluation of product attributes depends on the customers' perception of OPR's comprehension, either the OPR is easy or difficult to comprehend in visualizing and evaluating different types of products (Huang et al., 2013). When a customer perceives that OPR is easy to comprehend and improve his or her judgement of a particular product, then he or she exerts less decision effort and enhances decision effectiveness in choosing final product. In contrast to that, if a customer perceives that OPR is difficult to comprehend, then he or she has to exert more cognitive effort to evaluate a longer list of alternative products which might reduce the decision quality due to difficulty associated in using or comprehending the OPR. However, perceived ease of OPR use refers "*the degree to which a person believes that using OPRs is easy*" (Benlian et al., 2012).

Several past studies (Häubl & Murray, 2006; Kleinmuntz & Schkade, 1993) suggest that the way in which information is displayed influences decision processes by affecting the ease of carrying out different processing operations. As people generally prefer ease of use in processing the information, they tend to use processing strategies that are facilitated by a given display format which reduce task difficulty (Häubl & Murray, 2006). The OPRs have various characteristics such as product list, 3D product presentation, attribute trade-off relationship transparency, product comparison matrix, product rating, which provide convenience to the consumer to evaluate the product quality. For example, comparison matrix of recommended product assists the customers to easily evaluate the various product attributes across alternatives. Similarly, attribute trade-off relationships

transparency in OPR helps the customers to perceive greater ease to comprehend and evaluate the product, because it conveys the values of attributes and the relationships among them which is easy to recall (Xu et al., 2014). This attribute trade-off transparency of OPR consists of information that provides convenience to the consumers in evaluating the product attributes (Xu et al., 2014). According to human information processing theory, this ease of using OPR helps to free other cognitive resources of the consumers for making decision to select a final product.

Conversely, if the OPR contains only textual information of product attribute and do not contain pictures, then it would be boring and difficult for the consumer to read and understand the full textual contents of the recommendation (Benlian et al., 2012). Empirical researches in educational psychology (i.e. reading comprehension) reported that the cognitive effort for reading full-text sentences and passages is higher as compared to screening pictures and small chunks of key product information (Britton, Glynn, Meyer, & Penland, 1982). In the case of consumer reviews, past consumers provide product recommendations in the form of pros and cons of the product attributes, and also contain structured and easily distinguishable attributes such as "star ratings" (Benlian et al., 2012). Nevertheless, no matter how useful they are, consumers have to first go through the unstructured text of varying formats, length, and style to get relevant product information (Benlian et al., 2012). This type of OPR is perceived less easy to comprehend in evaluating products and supporting the shopping task (Benlian et al., 2012).

Moreover, people prefer OPR which is easy to use due to their limited cognitive capacity (Huang et al., 2013). Consistent with the theory of human information processing (Payne, 1982; Payne, Bettman, & Johnson, 1988; Simon, 1955), customers can minimize their cognitive effort in decision making on the basis of two-stage decision process. In the 1st

stage, the set of alternative products is minimized to a certain level, while in the 2nd stage, this manageable set of products is further evaluated in detail. The OPR supports this two-stage decision process which provide convenience to the consumers in evaluating the product. The OPR provides limited and concise decision relevant information which is easy to use for making buying decision.

Huang et al., (2013) conducted a study on review-product congruity proposition and reported that OPR facilitates ease of comprehension by providing OPR (objective and subjective information) – product (search and experience) congruity based information. They found that congruity based recommendations improve consumers perceived ease of using or comprehending OPR by minimizing their cognitive effort in making judgement about the product quality. They explained the ease of comprehending OPR based on stimulus- and brain stored- schemas. OPR galvanises customer' stimulus-based schema. The response of a customer to new incoming information described by a stimulus-based schema depends on the perceived congruity of the external schema with existing brain-stored schema (Huang et al., 2013). When an OPR render information that matches the activated brain-stored schema, the consumer would experience favourable comprehension or easy to use due to the formation of consistent mental representation.

Bhattacherjee (2001b) developed the IS continuance model and incorporated perceived usefulness due to its consistent predictive power of the IS usage behaviour over both adoption and post-adoption stages. Additionally, Bhattacherjee (2001b) argued not including the perceived ease of use in the model based on the observation of Karahanna et al. (1999) that explains "*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' job performance*" (p. 200). Furthermore, empirical studies comparing relative impacts of perceived usefulness and perceived ease

of use during pre-adoption and post-adoption stages of IS use reported that in contrast to usefulness, 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 (Bhattacherjee, 2001b; Davis, 1989; Karahanna et al., 1999). Conversely, Thong et al. (2006) and Lee (2010) extended the IS continuance model by incorporating perceived ease of use. They found that perceived ease of use plays significant role in predicting post-adoption satisfaction and IS continuous usage intention. Thong et al. (2006) argued that incorporating perceived ease of use construct depends on the technological context of the study, because complexity of IS usage is closely related to the perceived ease of use. Following this reasoning, this study included perceived ease of use for determining consumers' perception of OPR performance. Incorporating the perceived ease of use may help to better explain OPR continuous usage phenomena. The following section presents the significance of perceived usefulness.

2.5.1.2. Perceived Usefulness

Perceived usefulness is the main construct of IS continuance model (Bhattacherjee, 2001b) and it is defined as "*the degree to which a person believes that using OPRs would enhance his or her product evaluation performance* (Benlian et al., 2012). Several past studies indicated that OPRs assist customers to evaluate and choose from a massive set of alternative products available on the e-commerce websites. OPR provides a concise set of related products which is more likely to match their needs (Benlian et al., 2012; Häubl & Trifts, 2000; Senecal & Nantel, 2004). Thus, OPR enables customers to cope with the overwhelming information burden, which increases their ability and effectiveness in making satisfying buying decision (Benlian et al., 2012; Komiak & Benbasat, 2006).

The human information processing theory (Simon, 1955) asserts that due to limitations in people's cognitive capacity that include limited working memory and limited computational capabilities, they tend to "satisfice" while processing information. The theory argues that customers can enhance their effectiveness in assessing product quality by adopting two-stage decision-making process (Benlian et al., 2012; Kumar & Benbasat, 2006). In the first stage, the OPR enables consumers to have a manageable set of alternative products, whereas in the second stage, they can evaluate this reduced and concise set of products more carefully to arrive at a final choice. The OPR provides task relevant cues which improve consumers' utilitarian value resulting greater perceived usefulness (Parboteeah, Valacich, and Wells, 2009). Moreover, OPR is persuasive and is a rich source of product related information which is perceived useful in evaluating and understanding the performance of product attributes.

Benlian et al. (2012) argued that OPRs are more effective in reducing search costs for consumers and as a consequence, have a stronger impact on perceived usefulness. This argument was based on cognitive fit theory (Vessey, 1991), which was initially proposed to describe how matching problem representations (e.g. matrices, tables, and graphs) to different tasks can enhance problem solving. The theory suggests that a technology can help users to improve their task performance if there is a good fit between the task and the incoming information. The match between task and problem representations (i.e. OPR) can result in increased efficiency and effectiveness in solving problem (Benlian et al., 2012). For example, when OPR matches the buying task, then consumers can effectively evaluate different attributes of the product (Benlian et al., 2012). Later, Huang et al., (2013) found that congruity-based recommendations improve the consumer's perception of OPR helpfulness in making judgement about the product quality. When OPR renders information that matches the activated brain-stored schema, the consumers

perceive greater helpfulness of OPR (Huang et al., 2013). They defined the perceived OPR helpfulness as "*the consumer perception of the extent to which the OPR assists him or her in evaluating the focal product*".

However, this study argues that OPR users can immediately see and evaluate products' key attributes (e.g. key features, short description) and their values (e.g. price). By scanning content of the OPR, they infer both the most important products attributes and different values for each attribute. Additionally, consistent with the argument of Parboteeah et al. (2009), the OPR provides more task-relevant cues that facilitate and enable the customers in evaluating the product's key attributes and their values, and will therefore be perceived by customers as being more useful (Benlian et al., 2012).

The following section presents discussion on the factors related to consumers' social-psychological beliefs.

2.5.2. Social-psychological Beliefs

Literature review revealed that perceived confirmation and trusting belief are two important factors representing consumers' social-psychological beliefs that refer to the factors leading an individual to behave in a given way in the presence of others, and look at the conditions under which certain behavior/actions and feelings occur (Allport & Lindzey, 1959). Several past studies have used perceived confirmation (Bhattacherjee, 2001b; Lee, 2010; Serenko & Stach, 2009) and trusting beliefs (Benbasat & Wang, 2005; Benlian et al., 2010, 2012; Gefen et al., 2003; Komiak & Benbasat, 2006; Thong et al., 2006) in investigating the IS adoption and post-adoption phenemena and found that they

play important role in predicting the satisfaction and continued use intention. A detailed discussion on the significance of these factors is presented in the following sub-sections.

2.5.2.1. Perceived Confirmation

Perceived confirm is one of the major constructs from IS continuance model and it is defined as "*users' perception of the congruence between expectation of technology use and its actual performance*" (Bhattacherjee, 2001b). Bhattacherjee (2001b) developed new scales in order to measure the post-adoption expectation-confirmation of the technology users. Users' confirmation of expectations suggests that individuals obtained expected benefits by experiencing target technology that postively impacts their satisfaction with the technology. Contradictarily, individuals' failure to confirm expectations for obtaining expected benefits leads to negative effect on their satisfaction. This relationship is originally explained in the ECT-based studies (Lin et al., 2005; Oliver, 1980, 1981; Oliver & DeSarbo, 1988; Prakash, 1984; Swan & Trawick, 1981), where satisfaction is separately influenced by expectation, and confirmation after actual technology usage. These studies explain that users' expectations provide the baseline for the confirmation in order to determine their satisfaction level. The IS continuance model also asserts that individuals' confirmation of expectations has positive impact on their perception of usefulness with the technology usage. The perception of usefulness could be made certained by confirming consumer's experience, especially when individuals' initial perception of usefulness is not concrete due to the uncertainty over what to expect from technology usage (Bhattacherjee, 2001b). Moreover, positive confirmation elevates individuals' perception of usefulness and negative confirmation deteriorate this perception (Bhattacherjee, 2001b).

Cheung, Luo, SIA, and Chen (2007) conducted empirical research on how people evaluate online recommendations and found that consumers' confirmation of prior beliefs significantly influence perceived credibility of online recommendations. They further reported that consumers can detect the level of confirmation between the information they receive and their initial perception of the reviewed product/service, through various direct or indirect experiences. When consistency in information is identified based on their prior knowledge, they will have more confidence to believe the information received and use them for subsequent purchase decisions (Cheung et al., 2007). If the online recommendation matches the consumers' existing perception, then they will more likely to trust the recommendation. Conversely, if the recommendation does not conform with the prior perception, consumers will probably refuse to accept the recommendation and would discount its validity (Cheung et al., 2007).

Although many empirical studies have investigated the impact of perceived confirmation on various post-adoption expectations (e.g. usefulness, ease use, enjoyment) in various technological contexts as discussed in section 2.2. In the context of OPR, no empirical study has directly investigated the effects of consumers' perception of confirmation on decision effort, decision quality, and satisfaction with OPR usage. However, various prior studies (Komiak & Benbasat, 2006; Wang & Benbasat, 2004; West et al., 1999; Xiao & Benbasat, 2007) also have highlighted the importance of considering and managing customers' expectations in the design of OPR, recommending that the customers might stop using OPR as they lose faith in its usefulness when the recommendations do not fulfil their expectations. Sinha and Swearingen (2002) reported that consumers often got disappointed with online recommendations, because they failed to help consumers to broaden their horizon. Komiak and Benbasat (2004) found that expectation disconfirmation is a key factor contributing to distrust in OPR. However, taking

consumers' perception of confirmation in the context of OPR, it is expected that the confirmation of consumers' expectations about OPR's functionalities and performance will enhance consumers' satisfaction, and disconfirmation of their expectations will lead to dissatisfaction.

The next subsection provides importance of considering consumers' trusting belief in examining the target phenomena.

2.5.2.2. Trusting Belief

Several past studies (e.g. Benlian et al., 2010, 2012; Häubl et al., 2004; Häubl & Murray, 2006; Sheng & Zolfagharian, 2014; Xu et al., 2014) reported that recommender systems provide product recommendations which assist consumers to make effective buying decision. Contradictorily, Sheng et al. (2014) and Häubl and Murray (2006) highlighted that If OPR can be so helpful to consumers, why it is not widely embraced by online customers? One of the main reasons for not widely embracing OPR is customers' trust on the recommendations (Häubl & Murray, 2006). It indicates that online customers have not developed an ongoing trust on OPR. Moreover, past studies (Xiao & Benbasat, 2011) have also reported that consumers have doubt on OPRs in terms of trustworthiness and performance. The general perception of consumers is that the e-retailers provide recommendations due to their vested interest of increasing sales or to promote the products rather than in consumers' interest (Cheong & Morrison, 2008). Consequently, this perception hampers consumers' intention to rely on the OPR for making buying decision (Benlian et al., 2012). Furthermore, several studies have also reported that e-retailers deliberately employ various deceptive tactics by manipulating system recommendations (e.g. Lee, 2014; Xiao & Benbasat, 2011) and consumer reviews (e.g.

Anderson & Simester, 2014; Luca & Zervas, 2016; Mayzlin et al., 2012; Yoo & Gretzel, 2009) for promoting an approach behavior. The customer's awareness of retailer's intention of deception leads them to less likely rely on these recommendations, even though having greater perception of product value (Xiao & Benbasat, 2011).

To be effective, the recommender systems must be trusted advisors (Urban, Sultan, & Qualls, 2000). Although several past evidences highlighted that recommender systems tend to be trusted more than traditional human advisors (Senecal & Nantel, 2004; Urban & Hauser, 2004), trust and credibility are dynamic and change over time as the balance between the costs and benefits of using a recommender system shifts (Häubl & Murray, 2006). According to Häubl and Murray (2006), this balance is not always easy to maintain due to the retailers' vested interest in providing product recommendations are not necessarily aligned with those of the consumers' preferences. Therefore, a recommender system must be able to deliver its promise to improve consumer's decision making while reducing the cognitive effort required to make a decision. However, it is important to investigate the impact of consumers' trusting belief on their perception of OPR performance in terms of decision effort, decision quality, and satisfaction with the OPR usage.

In this study, trusting belief refers to customers' perceptions about the competence, benevolence, and integrity of the recommender system in providing OPRs (Komiak & Benbasat, 2006). According to McKnight et al. (2002a) and Wang and Benbasat (2007), competence belief refers to the consumer's perception that the recommender systems have the skills and expertise to perform effectively in providing OPR, benevolence belief refers to the consumer's belief that the recommender systems care about him or her and acts in his or her interest while generating OPR, and integrity belief is the perception that

the recommender system adheres to a set of principles (e.g. honesty) that are accepted by consumers. The trusting belief is consistent with the concept of cognitive trust refers to "*a trustor's rational expectations that a trustee will have the necessary attributes to be relied upon*" (Komiak & Benbasat, 2004). According to Komiak and Benbasat (2006), cognitive trust is derived from the theoretical perspective of viewing trust as a trustor's rational choice, a perspective that is rooted in sociological (Coleman, 1990), economic (Williamson, 1993), and political (Hardin, 2002) theories. Literature review in the context of OPR showed that most of the past studies focused on cognitive trust (e.g. Benlian et al., 2010, 2012; Gefen et al., 2003; Häubl & Murray, 2006).

Several empirical studies (Benlian & Hess, 2011; Gefen et al., 2003; McKnight et al., 2002b; Pavlou, 2003) on information system have addressed the importance of trust in online environments and found trust as a key determinant of IS acceptance. Specifically in the context of OPR, trusting belief in e-commerce vendors and OPR has important direct and indirect (via perceived usefulness, perceived risk, or satisfaction) effect on OPR adoption (Benlian et al., 2012; Komiak & Benbasat, 2006; Wang, 2005; Wang & Benbasat, 2007, 2008).

Customer's trusting belief in OPR can be perceived as an extension of interpersonal trust, because individuals consider IS artefacts as social actors and they try to build their relationship with them (Benlian et al., 2012; Wang & Benbasat, 2007). When customers form preliminary trust in OPR, then their perception of information quality presented in OPR contribute to their cognitive and emotional evaluation of the OPR's truthfulness (Komiak & Benbasat, 2006). The customers make inferences about the trustworthiness of OPR by evaluating its explanatory information. Furthermore, the customers' belief in OPR's trustworthiness is improved, when explanatory information is in the form of why,

how, and product attribute trade-off explanation which is cognitively justified and disclose its underlying reasoning process (Benlian et al., 2012; Xiao & Benbasat, 2007). In addition to explanatory information of OPR, other related characteristics such as source credibility of OPR also influence customers' trusting belief, especially those customers who have limited knowledge of the recommended product (Benlian et al., 2012).

To sum it up, several empirical evidences supported the fact that people respond socially to technological artifacts and do perceive technological artifacts to have human-like properties. Similarly, consumers usually form trusting belief whether OPRs have the expertise to provide effective recommendations (i.e. is competent), or it care about them and acts in their interest (i.e. benevolence), or it is designed to "push" the products of a certain manufacturer (i.e. has integrity).

The following section presents the significance of affective belief.

2.5.3. Affective Belief

Affective belief refers to an individual's emotional response when interacting with an environmental stimulus (Sun & Zhang, 2006). Many past IS studies (Kamis et al., 2008; Koufaris, 2002; Sun & Zhang, 2008; Van der Heijden, 2004; Xu et al., 2014; Xu et al., 2013) has frequently used perceived enjoyment to capture users' affective feelings, and found that perceived enjoyment is an important component of individual's affective belief. It measures individual's perception whether interaction with a system is interesting or not (Csikszentmihalyi et al., 1977; Kamis et al., 2008; Koufaris, 2002). It is further discussed in the following sub-section.

2.5.3.1. Perceived Enjoyment

Perceived enjoyment is a key component of flow theory which is developed and deep rooted in psychology and has been used to address optimal user experiences with personal computers (Finneran & Zhang, 2005). Several past studies (Thong et al., 2006; Venkatesh & Brown, 2001; Xu et al., 2014) confirmed that perceived enjoyment is one of the most important users' beliefs in predicting IS adoption. Particularly in the case of a hedonic IS usage, perceived enjoyment is even more critical than perceived usefulness as a predictor of IS usage (Thong et al., 2006; Van der Heijden, 2004). Perceived usefulness refers to the organizational aspects of IS which provide an instrumental value to IS users, whereas perceived enjoyment emphasizes the hedonic aspects of IS which provide a pleasurable experience to IS users (Thong et al., 2006). Thus, perceived enjoyment is defined as "*the extent to which an activity of IS usage is perceived to be enjoyable in its own right, apart from any performance consequences which may be expected*" (Thong et al., 2006).

Vallerand (1997) classified two types of motivation: intrinsic motivation and extrinsic motivation. Intrinsic motivation emphasizes the pleasure, fun, or satisfaction of being participated in an activity. Contradictorily, extrinsic motivation emphasizes the rewards or achievements which are expected from a goal-driven activity (Deci, 1971). Accordingly, perceived enjoyment can be considered as an intrinsic motivation, and perceived usefulness can be described as an extrinsic motivation (Davis et al., 1992). Users' perceived enjoyment can also determine their level of satisfaction, because they use a particular technology not just for improving the performance, but also for entertainment or fun (Thong et al., 2006). As more and more technologies are available in order to meet diverse needs of the users, it is anticipated that the post-acceptance level of enjoyment is also important in affecting the users' satisfaction (Thong et al., 2006).

In the context of e-commerce, various informational features on website have the ability to generate affective arousal in online buyers, which reflects the hedonic value of these IS features (Davis et al., 1992). Consumer behaviour researches related to e-retailers' sites have shown that various web characteristics such as personalized greeting with product recommendations consisting of socially-rich textual explanation of the product attributes, lead to the increased customers' perception of hedonic value (Benlian et al., 2012; Hassanein & Head, 2006; Morris & Elizabeth, 1982; Qiu & Benbasat, 2009). Consumers' core affect consist of hedonic value (the extent to which one feels pleasure or displeasure) and arousal value (the extent to which one is feeling engaged, or drowsy, or energized), which are free of any cognitive processing and rely at the heart of individual's moods or emotions (Russell, 2003). The hedonic value plays an equal role as instrumental beliefs (Van der Heijden, 2004) and is an important determinant of e-loyalty (Koufaris, 2002).

OPR has various features (star rating, consumer reviews, and pictorial presentation of product) which provide intrinsic and extrinsic motivations to consumers. For example, OPR containing past customers' personal experiences with a product usage in the form of personal stories and narrative including different explanatory examples (Cheong & Morrison, 2008), which have the ability in creating vicarious experience (Deighton, Romer, & McQueen, 1989). Several past communication researches (e.g. Reinard, 1988; Tal-Or, Boninger, Poran, & Gleicher, 2004) demonstrated that narratives and examples have significant influence on the individuals' beliefs. In the context of persuasion research, these messages are more emotional and persuasive than statistical information (O'keefe, 2002). Moreover, information or messages without examples might be seen unemotional, vague, and impersonal (Benlian et al., 2012). As emotion and enthusiasm conveyed in the OPR; describing and explaining joy or displeasure of a product would lead similar type of feelings or perception in the minds of the potential customers (Bickart

& Schindler, 2001) or could lead the customers to become emotionally immersed (Hassanein & Head, 2006).

In addition to the textual explanation of product attributes, past studies also reported that other features of OPR which significantly influence consumers' perception of enjoyment with the OPR usage. For example, Xu et al. (2014) conducted an experimental study to investigate the impact of trade-off transparency feature of recommender system on customers' perception of enjoyment. They reported that the trade-off transparency feature vividly shows how the product attribute values are related to each other and can interactively respond to a user's attribute preference indication. The consumers can see the trade-off relationships between the required attributes of the product. This interactivity stimulate their sensory experience, and subsequently lead to positive emotional effects (Xu et al., 2014). Moreover, Parboteeah et al. (2009) conducted study on environmental stimulus and reported that an interface with stimulating cues has a positive influence on consumers' affective feelings with the content presented. Animated images and icons presented on online recommendations were found to be meaningful (Griffith, Krampf, & Palmer, 2001), which subsequently impact consumers' affective feelings with them. Moreover, several prior studies (Kamis et al., 2008; Koufaris, 2002; Sun & Zhang, 2008; Van der Heijden, 2004; Xu et al., 2014; Xu et al., 2013) found that perceived enjoyment is an important component of individual's affective belief, which can effectively capture users' task-relevant cues (e.g. security seals) and mood-relevant cues (e.g. colors) (Parboteeah et al., 2009). Therefore, it would be interesting to examine consumers' emotional states by emphasizing on perceived enjoyment.

The following section presents factors related to OPR performance which directly determine consumers' OPR continuous usage intention.

2.5.4. OPR Performance and OPR Continuous Usage Intention

Literature review revealed that most empirical studies investigated the informational and normative determinants of OPR's effectiveness and their impact on consumers' beliefs, particularly perceived helpfulness and purchase intention. Additionally, a number of studies (Häubl et al., 2004; Häubl & Murray, 2006; Häubl & Trifts, 2000; Hess et al., 2006; Xu et al., 2014) also demonstrated that decision making effort, decision quality, and satisfaction are directly related to customers' goals in using OPR. For example, Xu et al. (2014) found that customers' perception of decision effort exerted and decision quality achieved as usage outcomes significantly influences their intention to reuse recommender system. In align with their findings, perceived decision effort, decision quality and satisfaction can be considered as surrogate measures of OPR performance to examine their impact on customers' OPR continuous usage intention. Decision effort and decision quality are two central components of effort-accuracy model, and satisfaction is a key construct of IS continuance model. The theoretical and logical explanation of these factors measuring OPRs performance are described in the following sub-sections.

2.5.4.1. Perceived Decision Effort and Decision Quality

Decision effort and decision quality are main elements of effort-accuracy framework. Decision effort refers to the psychological costs of processing information (Perera, 2000). It represents the amount of effort exerted by consumer in processing product information to arrive at his purchase decision (Perera, 2000; Xiao & Benbasat, 2007; Xu et al., 2014). Whereas decision quality refers to the extent where consumers have bought the product that fit their needs or taste (Xu et al., 2014; Zhang, Agarwal, & Lucas Jr, 2011).

Individuals' decision making depends on specific situations and environments (Payne, 1982). They try to reduce the amount of decision effort associated with decision making (Häubl & Murray, 2006). Consistent with idea of bounded rationality, individuals strive to make trade-off between effort and accuracy while making satisfactory decision (Simon, 1955). This is particularly important when several alternatives are available and difficult to compare them or decision environment is very complex (Payne et al., 1993). In order to cope with this complexity of decision environment, people use various computer-based technologies. These technologies contain decision aids which perform distinct information processing activities. The motivating principle to use decision aid is to free up some of the individuals' information processing capacity, which subsequently enabled them to make effective decisions while reducing their cognitive effort (Häubl & Murray, 2006). Past studies have reported mix findings regarding the impact of decision aid on decision effort and decision quality. For example, Benbasat and Todd (1996) reported that the use of decision aid does not necessarily improve decision making performance. Schafer et al. (2002) and Fasolo et al. (2005) demonstrated that decision aid not only increase decision quality, but also decision effort. Given this mixed evidence, it cannot be assumed that a consumer's use of decision aids in an online shopping context will lead to reduce decision effort and increased decision quality.

Underlying the complexity of the decision environment, individuals often face difficulty to evaluate the available alternatives in great depth prior to arrive at a decision choice (Häubl & Murray, 2006). In order to make an effective decision, they tend to use two stage decision process (Payne et al., 1988). Customers screen a large set of relevant products without examining them in depth and then identify a subset containing the most promising alternatives. Subsequently, customers perform in depth analysis of attribute trade-off relationship across the most relevant products and then make a purchase

decision. The decision aid tools such as recommender systems provide support to the customers related to two stage process: (1) initial screening of products in order to provide a consideration set that customers consider for purchase, and (2) further facilitate customers to make an in-depth comparison using comparison matrix across various products before making an actual purchase (Häubl & Murray, 2006). The list of recommended product provides information about the relative utility of available products, products with the highest subjective utility tend to appear in the top of a product list. Therefore, customers would less likely consider inferior alternatives for purchase while exerting less decision effort (Häubl & Murray, 2006).

Several past studies (Häubl & Murray, 2006; Kleinmuntz & Schkade, 1993) also suggested that the way in which information is displayed influences decision processes by affecting the ease of carrying out different processing operations. As decision makers generally try to conserve decision effort in processing information, they tend to use processing strategies that are facilitated by a given display format which not only reduce task difficulty but also improve decision quality (Häubl & Murray, 2006). The OPRs have various characteristics such as utility based product list, 3D product presentation, attribute trade-off relationship transparency, product comparison matrix, and product rating, which assist the consumer to conserve cognitive effort in order to arrive at final choice. For example, comparison matrix of recommended product assists customers to choose a product that provides relatively greater utility across different products. Similarly, product attribute trade-off relationships transparency helps customers to make better decision based on comparison between various attributes of a particular product (Xu et al., 2014).

Furthermore, past researchers (Häubl et al., 2004; Häubl & Murray, 2006; Payne et al., 1993; Taylor & Todd, 1995; Xu et al., 2014) also found that OPRs affect the effort-accuracy trade-off in decision making. For example, Häubl and Trifts (2000) conducted an experimental study and demonstrated that the presence of personalized product recommendations enabled consumers to make purchase decisions with significantly less cognitive effort than would otherwise be required. They measured decision effort on a particular shopping trip as the number of products for which the customer evaluated a detailed description. They found that customer assisted by OPRs looked at an average of just 6.6 product descriptions, whereas those without assistance, examined an average of 11.7 products. This finding is consistent with the notion that reducing the decision making effort is the primary motivation for using OPRs (Diehl, Kornish, & Lynch, 2003). In contrast to that, Häubl and Murray (2006) reported that the cost of relying on recommender systems may result in poor recommendations that do not match the customer's preference. If the OPR influences the customers to buy an inferior product or pay a higher price, the gain in decision making efficiency is overshadowed by the loss in decision quality (Häubl & Murray, 2006). Consequently, poor recommendations causes to lose their credibility and are unlikely to be trusted for advice in the future (Gefen et al., 2003; Häubl & Murray, 2006).

To sum it up, the literature showed that OPR that facilitate in-depth comparisons among selected alternatives may have strong favourable effects on both the quality and the efficiency of consumers' purchase decisions. The usage of OPR may enables the customers to make much better decisions while exerting substantially less decision effort. Moreover, decision effort and decision quality as OPR performance play important role in deciding whether to continue or discontinue using OPR. If the customers perceive OPR as a decision strategy that assist them in reducing their decision effort while making

satisfactory buying decision, then they would most likely continue using the similar OPRs for future buying (Häubl & Trifts, 2000; Hostler et al., 2005; Wang & Benbasat, 2009; Xu et al., 2014). Contradictorily, if customers perceive that OPRs do not facilitate in improving decision quality, then they would more likely to discontinue using the OPRs for future buying (Xu et al., 2014). Moreover, if the customers perceive that using OPRs requires extra effort for searching and screening alternate products in order to make a final choice, with all other things being equal, then they would prefer to rely on their own capabilities rather than relying on the OPRs in order to make a final choice (Xu et al., 2014). To this end, it would be interesting to consider the role of perceived decision effort and perceived decision quality in understanding the consumers' OPR continued use intention. The following section presents the third element of OPR performance that is customer satisfaction.

2.5.4.2. Customer Satisfaction

Literature content analysis showed that 15 studies have focused on satisfaction construct in the perspective of OPR usage. Majority of the studies (12 out of 15) focused on decision making satisfaction and only three studies focused on an overall satisfaction with the usage of online recommendations. Overall satisfaction refers to affect rather than collection of beliefs towards accuracy, timeliness and effort (Bhattacherjee, 2001b). Since the decision effectiveness of OPR usage is already captured through decision effort and decision quality, it would be appropriate to consider overall customer satisfaction as a measure of OPR performance. Although, several prior studies (e.g. Bhattacherjee, 2001b; Griffiths et al., 2007; Schaupp, 2010) have reported that significance of managing customers' post-usage satisfaction in the context of IS continuous usage. The content

analysis revealed that no existing studies have examined the post-adoption satisfaction with OPR usage.

Satisfaction was initially defined by Locke (1976, p. 1300) in the context of job performance as "*pleasurable or positive emotional state resulting from the appraisal of one's job".* Later in the context of consumption, Oliver (1981, p.29) defined satisfaction as "*the psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumers prior feelings about the consumption experience*". Then, Bhattacherjee (2001b) argued that satisfaction is "*a psychological or affective state related to and resulting from a cognitive appraisal of the expectation performance discrepancy (confirmation)*" (p.354). Bhattacherjee (2001b) further argued that lower expectation and/or higher performance lead to greater confirmation, which positively influences customer satisfaction. Customers' expectation is influence by their first-hand experience. Post-usage expectations are different from their pre-usage expectation. Pre-usage expectations are usually based on opinions of others or information disseminated through mass media, while post-usage expectations are influenced by customers' first-hand experience, and it is more realistic (Bhattacherjee, 2001b). However, post-usage expectations may result in increased or decreased expectations depending on whether the product/service is found to be useful or not. The updated perception, which is also explained by self-perception theory (Bem, 1973) provides basis for subsequent behaviours. Therefore, this study included satisfaction as an additive function of post-usage expectations and confirmation and it is defined as "*an affect, captured as a positive (satisfied), indifferent, or negative (dissatisfied) feeling*" (Bhattacherjee, 2001b).

Satisfaction is conceptually a transient, experience-specific affect, which is key determinant of consumers' behavioural continuous usage intention. For example, online brokerage users reason their service dissatisfaction to brokers' inability to meet their expectations about maintaining server uptime, executing timely orders, and providing reasonable margin rates (Bhattacherjee, 2001b). Similarly, online customers are dissatisfied with OPRs, when the recommended product do not meet their needs or desires (Benlian et al., 2012).

In an online environment, satisfaction is proven to be a driving force in making online purchases (Yoon, 2002) or to continue using a particular decision aid system (Xiao & Benbasat, 2007). Several studies identified different factors pertaining to satisfaction. For example, Bhattacherjee (2001b) conceptualized satisfaction as affect toward the system itself, which in turn is influenced by perceived confirmation and perceived usefulness. Bechwati and Xia (2003) reported that consumers' decision making satisfaction is determined by perceived cognitive effort of processing information generated by the system. Tsai and Chuang (2011) conducted an experimental study on the role of cognitive decision effort in using recommendation systems and found that information quality, system quality and cognitive decision effort influence customers' satisfaction with product recommender. Chen and Tseng (2011) found that customer satisfaction is influenced by the usefulness of information and the extent to which the customer uses information prior to purchase decision. Whereas, Gudigantala et al. (2011) conducted an experimental study and found that perceived cognitive effort, perceived accuracy, and perceived effectiveness influence satisfaction with the web-based decision support system. Zha et al. (2013) investigated the impact of self-efficacy and decision quality on online shopping satisfaction and demonstrated that self-efficacy and decision quality are important determinants of satisfaction.

Furthermore, various empirical IS studies also found that satisfaction is a key determinant of IS continuous usage intention (for details, see Table 2.10). In the context of OPR, a number of conceptual (e.g. Xiao & Benbasat, 2007) and experimental studies (e.g. Häubl & Trifts, 2000; Hostler et al., 2005; Wang & Benbasat, 2009; Xu et al., 2014) have also highlighted this notion that the customers would most likely continue using OPRs for future shopping, if they are satisfied with the result of their expectation-confirmation regarding OPRs usage whereby OPRs assist them not only to reduce decision effort exerted, but also to enhance their buying decision quality. Conversely, customers' dissatisfaction leads to avoidance behaviour on product purchase intention and OPR's continued use. Dissatisfaction normally arises when customers perceive that OPRs are not helpful in improving decision quality and also require extra cognitive effort for searching and screening alternate products in order to make a final choice. However, the above discussion indicates the significance of customer satisfaction to be considered as an additional surrogate measure of OPR performance.

2.6. Summary

This Chapter has presented the literature review of the previous studies. It has provided the details on OPR and sources. In addition to that, the study presented the content analysis which has focused on the factors pertaining to OPR effectiveness and inter-relationship among these factors are discussed. Moreover, past literature review over three-stage adoption process are briefly discussed and research gap existing in the literature is highlighted. The chapter also syntheses the post-adoption researches in terms of the antecedent factors influencing satisfaction and IS continuous usage intention. Subsequently, the most important and frequently used factors are discussed in detail. Finally, the related theories and models used in literature are discussed. The following Chapter 3 presents the proposed research model and underlying research hypotheses.

CHAPTER 3

RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

3. Introduction

The chapter aims to present the research model and hypotheses developed in addressing the problem statement and research questions. It consists of two sections: research model and hypotheses development. First section deals with the development of research model and justification of incorporating the constructs. The research model is developed based on three types of constructs: (1) consumers' OPR evaluation beliefs, (2) OPR performance, and (3) consumers behavioural response towards OPR continuous usage. Consumers' evaluation beliefs consist of five factors related to three belief categories: instrumental beliefs (i.e. perceived ease of use and perceived usefulness), social-psychological beliefs (i.e. perceived confirmation and trust), and affective belief (i.e. perceived enjoyment). Consumers' perception of OPR's performance is a formative construct consists of decision effort, decision quality, and satisfaction. Consumers' behavioural response refers to the OPR's continuous usage intention. The second section presents hypotheses development according to research objectives of this study following which six major hypotheses are developed and reflected in the research model. There are five hypotheses related to relationship between consumers' evaluation beliefs and OPR's performance, and one hypothesis showing the impact of OPR's performance on consumers' OPR's continuous usage intention.

3.1. Research Model

An important issue is whether online customers behave differently from their offline and mandatory counterparts due to unique characteristics of e-commerce. Prior studies have been conducted to include contextual issues: online versus offline use for shopping (e.g. Scarpi et al., 2014; Park et al., 2015; Davis and Lang, 2016) and voluntary versus mandatory use (e.g. Back et al., 2014; Tsai et al., 2016). Komiak et al. (2005) highlighted major issues regarding the environmental uncertainty, complexity, and risk of online channel. Subsequent several other studies (e.g. Benlian et al., 2012; Xiao and Benbasat, 2011) have also separately pointed a number of issues pertaining to e-commerce. First, nature of online environment involves a physical distance between consumers and e-retailers, and between consumers and products. In contrast to offline channel, online customers are usually uncertain whether products meet their needs or perform up to their expectations (Weathers et al., 2007). It is due to the lack of direct methods for online consumers to evaluate products before actual purchase (Benlian et al., 2012). Moreover, absence of physical interaction between consumers and retailers increases uncertainty and subsequently hinders their online buying decision. Second, immense product choices, the complexity, and enormous amount of information also challenge consumers' limited information processing capabilities (Sheng et al., 2014), as shown in 'Internet fatigue' phenomenon (Horrigan, 2008). Consequently, identifying a product which fit their need is not an easy task (Sheng and Zolfagharian, 2014). Third, consumers have choice to continue or stop using at any time, which makes them more powerful. However, maintaining consumers' loyalty in online environment is more complicated and difficult (Rafiq et al., 2013). Fourth, e-retailers can easily take benefits by generating high consumers risk due to unregulated activities and lower enforcement of legislations related to online shopping (Xiao and Benbasat, 2011). Therefore, based on the nature of

technology and online environment, prior studies have considered unique factors such as perceived risk (Ayanso et al., 2015), flow (Lee, 2010), trust (Hoehle et al., 2012), perceived playfulness (Terzis et al., 2013), and perceived compatibility (Islam, 2012) while investigating the technology adoption. Arguably, the issues related to the online environment can also apply to OPR, and considering various unique factors related to OPR and e-commerce environment are expected to play important role in predicting OPR performance and consumers' OPR continued use for future purchase.

This study conducted a comprehensive literature review of IS adoption studies in general and OPR adoption studies in particular, as discussed in Chapter 2. Content analysis of the past studies assists the author to identify underlying theoretical models and salient factors that have been used in the prior researches to examine adoption and post-adoption of various target technologies. In order to fulfil research objectives of this study, the author adopted nine constructs from four theoretical models: (1) IS continuance model, (2) effort-accuracy model, (3) theory of trust formation, and (4) flow theory. The four theoretical models are subsequently integrated for developing the research model and examining the causal relationship between constructs.

In order to develop the integrated research model, all nine constructs are arranged and categorized into evaluation beliefs, OPR performance, and behavioural response based on the recommendations of Jacoby (2002). Jacoby (2002) proposed 7 sectors framework as a guideline for developing a consumer behaviour research model by designating whether a specific phenomenon should be considered and represented as evaluation belief, internal response or external response. According to Jacoby (2002), customers' evaluation beliefs can be categorized as cognitive or effective beliefs, or both, which lie in sector 4 [customers consciously processing of informational cues comes from sectors

1 (external cues) and 2 (internal cues), and later store in sector 3 (store house of individual's emotive and cognitive system including prior retained experiences). The constructs related to response can be represented by internal responses or external responses, or both. Internal responses lie in sector 6 (contains those outcomes are from sector 4, and are not directly visible to outsiders – non-detectable) and external responses lie in sector 7 (directly visible to others - detectable). Responses can be elicited in different forms ranging from internal to external and represent changes in impressions, attitude, judgement or assessment of quality as well as in intentions (Jacoby, 2002). Therefore, in align with Jacoby (2002)'s recommendations, five constructs (i.e. perceived ease of use, perceived usefulness, perceived confirmation, trusting beliefs, and perceived enjoyment) related to OPR evaluation beliefs, three constructs (i.e. perceived decision effort, perceived decision quality, and satisfaction) related to perceived OPR performance as internal response, and one construct related to consumers' behavioural response (i.e. continuous usage intention) as external response are included in the research model.

The main objective of this study is to examine the impact of OPR evaluation factors on OPR performance, which then directly influence consumers' OPR continuous usage intention. Factors related to evaluation beliefs are examined to identify their impacts on perceived OPR performance. The five evaluation factors whereby three factors (i.e. perceived ease of use, perceived usefulness, and perceived confirmation) are adopted from IS continuance model (Bhathacharjee, 2001a; Thong et al., 2006), one factor (i.e. trusting beliefs) is adopted from theory of trust formation, and one factor (i.e. perceived enjoyment) is adopted from flow theory. There are two reasons for choosing these factors as customers' OPR evaluation beliefs: (1) these factors have been frequently used in the prior adoption and post-adoption literature in various technological contexts, indicating saliency of these factors in examining underlying phenomenon, and (2) a panel of experts

consulted in this study also suggested to consider OPR evaluation factors as they play a critical role in influencing consumers' perception of OPR performance in buying decision process. The five OPR evaluation factors (as per their inherent nature and definitions) are further divided into three different belief categories: instrumental beliefs (i.e. perceived ease of use and perceived usefulness), social-psychological beliefs (i.e. perceived confirmation and trust), and affective belief (i.e. perceived enjoyment). Consumers' evaluation beliefs play an important role in the usage of a particular informational source (Jacoby, 2002; Xiao & Benbasat, 2007). According to Fishbein and Ajzen (1975), individuals' descriptive beliefs about an object can be formed through direct experience with such object. Limayem and Hirt (2003) and Venkatesh et al. (2003) have also shown that the use of IS can serve as a basis for the formation or updating users' evaluations (i.e. ease of use, usefulness, trustworthiness, and satisfaction) of the IS usage at subsequent stages. Later on, Xiao and Benbasat (2007) conducted a conceptual study based on synthesis of past literature in the context of product recommender system, and highlighted a number of research gaps in the literature. They reported that perceived ease of use, perceived usefulness, trusting beliefs, and perceived enjoyment are important consumers' evaluation beliefs which, in turn, influence the consumers' intention for future OPR use. Particularly, instrumental factors and trusting belief are well-recognized as important determining factors of OPR reuse and repurchase intention (Benlian et al., 2012; Qureshi et al., 2009; Fang et al., 2014). However, in addition to the instrumental factors, trusting belief in OPR as additional expectation can also contributes in explaining consumers' perception of OPR performance. Consumers' trust in OPR reduces their concerns regarding the uncertainty, complexity, and risk of online shopping (Fang et al., 2014; Benlian et al., 2012). Benlian et al. (2012) conducted an experimental study and reported that consumers' trusting beliefs in OPR is as important as instrumental factors in influencing OPR adoption. It is because that consumers' perceptions of uncertainty and

risk in using the OPR are particularly salient (Benlian et al., 2012). If consumers do not have sufficient trust in OPR, they will see less benefits in using OPR and subsequently may switch to other mechanisms. A lack of trust is likely to discourage consumers from relying on OPR, indicating a key obstacle in consumers' intention to continue OPR use. However, past studies implicitly showed that consumers' OPR evaluation beliefs can effectively address the main issues of perceiving OPR performance and OPR continued use which could be effected by environmental uncertainty, complexity, and risk of online channel.

In addition to OPR evaluation factors, factors related to OPR performance are also considered and examined to identify their direct impact on consumers' OPR continuous usage intention. Literature content analysis revealed three key factors (i.e. perceived decision effort, perceived decision quality, and satisfaction) that have been used separately as surrogate measures of OPR performance. This study adopted the three factors as measures of OPR performance. Out of the three factors, first two factors (i.e. perceived decision effort and perceived decision quality) are adopted from effort-accuracy model, and third factor (i.e. satisfaction) is adopted from IS continuance model. Several past studies (e.g. Häubl et al., 2004; Häubl & Murray, 2003, 2006; Häubl & Trifts, 2000; Payne et al., 1993; Xiao & Benbasat, 2007; Xu et al., 2014) reported two main objectives of consumers in using OPR: to increase decision quality and to reduce decision effort. For example, Payne et al. (1993) reported that a typical decision maker often faces two objectives: to maximize accuracy (decision quality) and to minimize cognitive effort. Since product recommender systems perform resource-intensive information processing job of screening, narrowing, and sorting the available alternatives before providing recommendations, consumers can free up their cognitive processing capacity in evaluating alternatives and choosing products that meets their needs (Xiao & Benbasat,

2007). Consequently OPR enables consumers to easily locate and focus on alternatives matching their preferences, which would result in reduced decision effort and improved decision quality.

Furthermore, Xu et al. (2014) found that perceived enjoyment and perceived product diagnostic ability of recommender system significantly influence the consumers' perceived decision making effort and decision quality, which subsequently impact their intention to reuse OPR for future purchase. In addition to perceived decision effort and perceived decision quality as surrogate measure of OPR performance, this study takes one step further by incorporating consumer' overall satisfaction with the OPR usage as additional measure of OPR performance, which has been consistently considered a salient non-financial measure of technology performance and key determinant of users' continuance intention. Several past studies (e.g. Bhattacherjee, 2001b; Lee, 2010; Thong et al., 2006; Tsai & Chuang, 2011) have highlighted that satisfaction is a key determinant of IS continuous usage intention. These studies argued that satisfaction plays an important role in explaining the acceptance–discontinuous usage anomaly phenomenon which often occurs in the context of IS adoption. If a user is dissatisfied or his enthusiasm diminishes after the initial IS usage, then he or she decreases his or her subsequent IS use or may be discontinue IS subsequently. In the context of OPR, a number of conceptual (e.g. Xiao & Benbasat, 2007) and experimental studies (e.g. Häubl & Trifts, 2000; Hostler et al., 2005; Wang & Benbasat, 2009; Xu et al., 2014) have also highlighted this notion that customers would more likely continue OPR use, if they are satisfied with the OPR use. Additionally, if consumers perceived that OPR usage leads to increase buying decision quality and also decrease decision effort, then they would continue OPR use for future purchase. Otherwise, they would rely on their own capability rather than on OPR for making future buying decision. Therefore, this study includes perceived decision effort, perceived

decision quality, and satisfaction as surrogate measures of OPR performance for predicting consumers' OPR continuous usage intention.

Moreover, Zhang (2007) proposed that various dimensions of constructs could be related to the concept of motivational affordance. Zhang (2007) argued that different motivational sources should be considered while designing any information system. The individuals would like to use and continue using IS to fulfil their different social, emotional, or psychological needs. The features of IS that support their motivational needs could impact the extent to which the IS will be used continuously (Zhang, 2007). Therefore, this study includes various OPR evaluation factors (i.e. ease of use, usefulness, confirmation, trust, and enjoyment) in the research model to examine the impact in determining the OPR performance in terms of reduced decision effort and increased decision quality and satisfaction.

Since all nine factors are adopted from four theoretical models: IS continuance model, effort-accuracy model, theories of trust formation, and flow theory, they are integrated to develop the research model. Integration of the four theoretical models is done because of following reasons: (1) they facilitate a parsimonious and academically justified way of fulfilling the research objectives, (2) they allow for investigating the impact of the instrumental, social-psychological, and affective beliefs as evaluation beliefs on OPR performance, in contrast to those studies (e.g. Häubl et al., 2004; Häubl & Trifts, 2000) that conducted to examine the direct effects of OPR usage on decision effort and decision quality, and (3) they offer a theoretical lens to examine the significance of OPR performance in determining the OPR continuous usage intention. However, the adopted constructs are mapped into the research model depicted in Figure 3.1. The subsequent section explains the hypotheses development and relationships between these constructs.

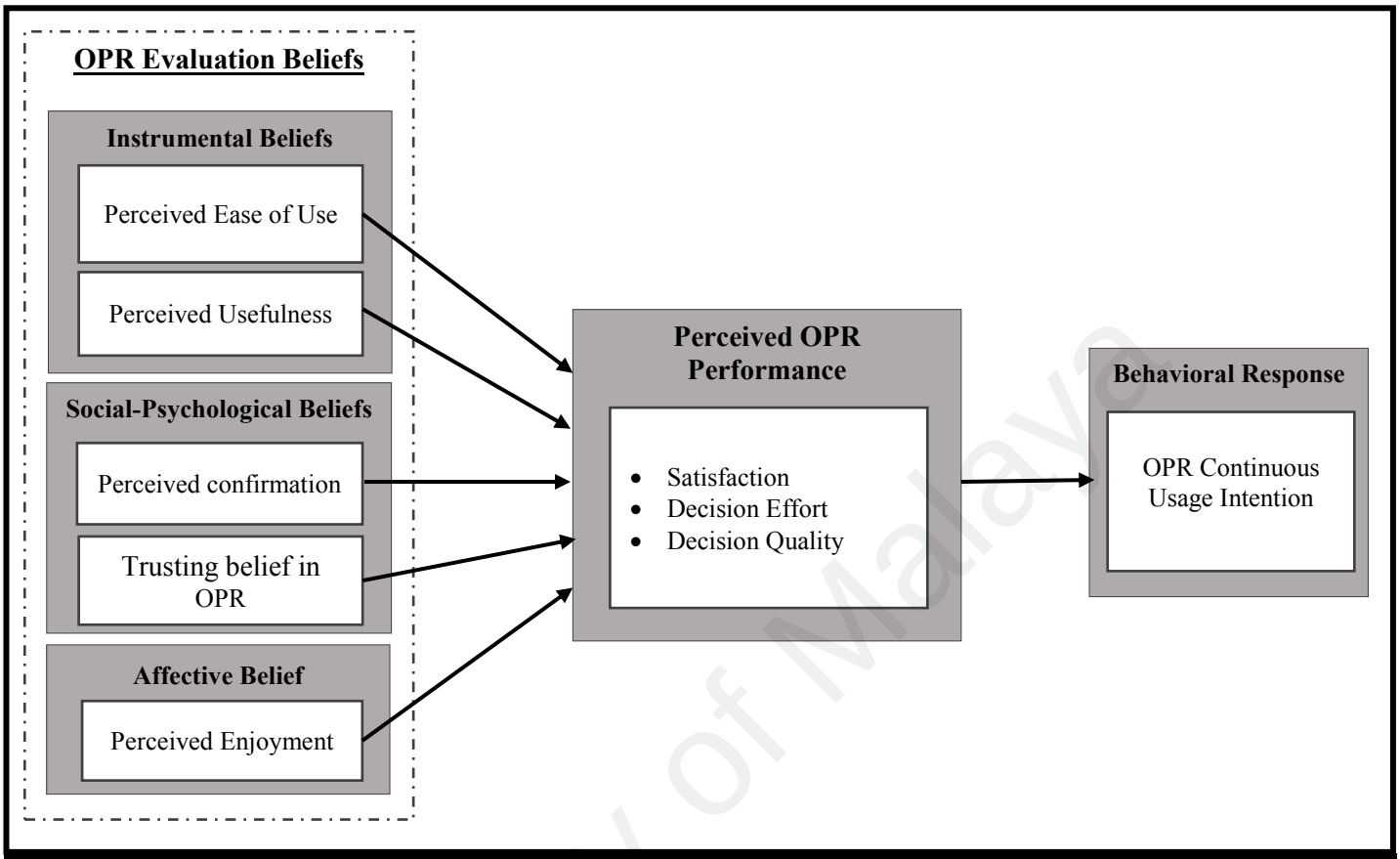


Figure 3.1: Proposed Research Model

3.2. Hypotheses Development

The research model of this study is empirically tested based on six hypotheses. Figure 3.2 portrays the research model with six hypotheses put forward in this study. Based on the research model and prior discussion in Chapter 2, the research hypotheses are presented in the subsequent sections.

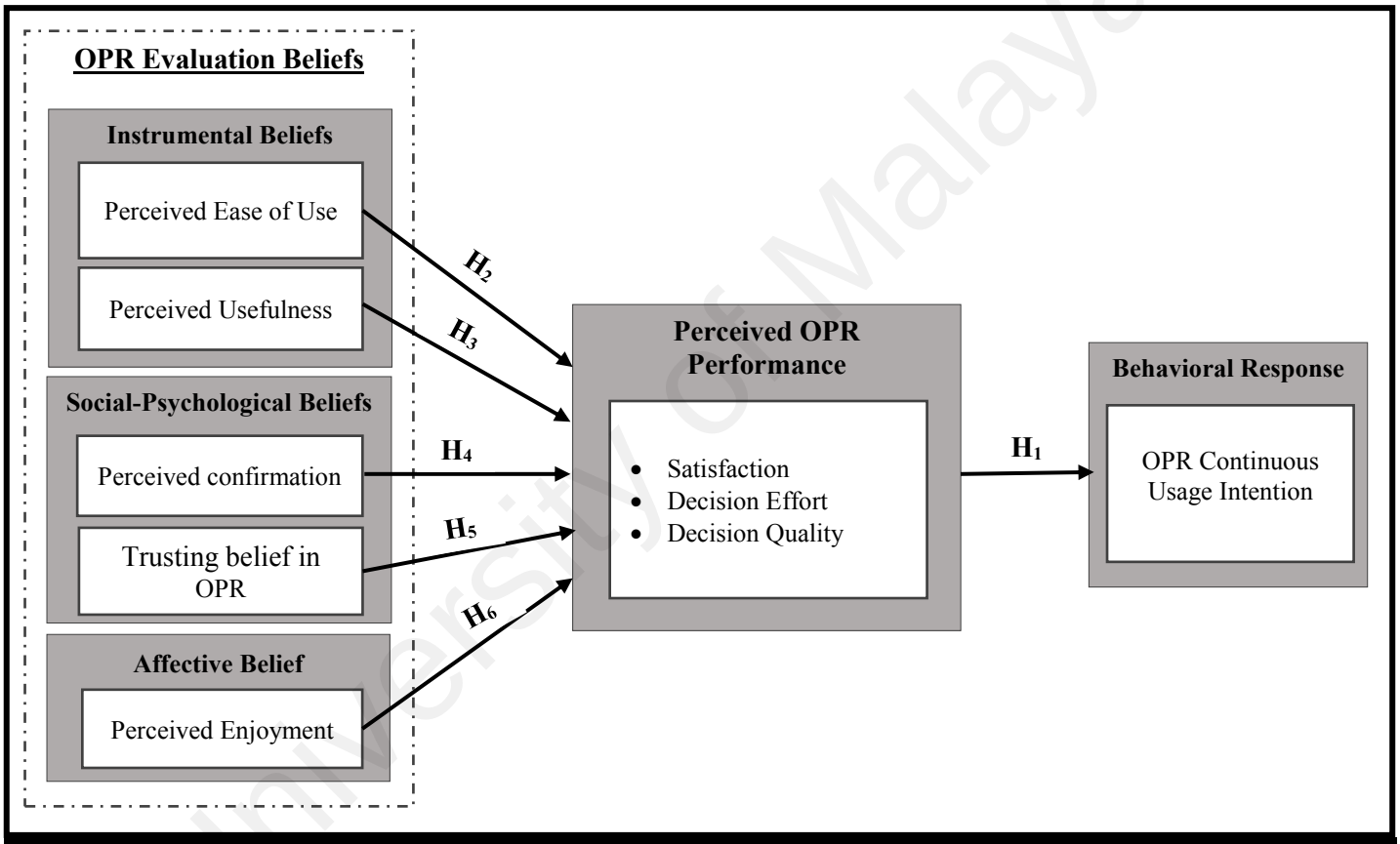


Figure 3.2: Research Model with Hypotheses

3.2.1. Relationship between Perceived OPR Performance and Consumers' OPR Continuous Usage Intention

Past studies (Häubl et al., 2004; Häubl & Murray, 2006; Häubl & Trifts, 2000; Hess et al., 2006; Xu et al., 2014) demonstrated that decision making effort, decision quality, and satisfaction are directly related to customers' goals in using OPR. Whereas, decision effort and decision quality are central factors of effort-accuracy model and satisfaction is the main factor of IS continuance model. Both models argued that these factors are the direct antecedents of IS continuous usage intention.

As discuss earlier that people use various decision aid tools which are designed to assist them to achieve their goals in the form of lower of decision effort and improved decision quality. For example, OPR as decision aid tool help customers to free up some of the processing capacity in further evaluating the recommended products to arrive at better buying decisions. Haubl and his colleagues (Häubl & Murray, 2006; Häubl & Trifts, 2000) found that OPR led customers to increase their decision quality by enabling them to easily locate and focus on alternatives matching their preferences and product attributes.

Consistent with the effort-accuracy model, if the customers perceive OPR as a decision strategy that assists them in reducing the decision effort exerted and also improving their buying decision quality, then they would most likely continue using OPR for future buying (Xu et al., 2014). In contrast to that, if customers perceive that OPR do not facilitate in improving decision quality for their online shopping, then they would more likely discontinue using the OPRs for future buying (Xu et al., 2014). Additionally, if customers perceive that using OPRs requires extra effort for searching and screening

alternate products in order to make a final choice, with all other things being equal, then they would prefer to rely on their own capabilities rather than relying on the OPR in order to make a final choice (Xu et al., 2014). Thus, lower (higher) decision effort and higher (lower) decision quality lead customers' intention to continue (discontinue) using OPR.

Similarly, according to IS continuance model, customers would most likely to continue using OPR for future shopping if they are satisfied with the results of their expectation-confirmation regarding OPR usage whereby it assists them not only to reduce decision effort exerted, but also enhance their buying decision quality (Häubl & Trifts, 2000; Hostler et al., 2005; Wang & Benbasat, 2009; Xu et al., 2014). As opposed to that, customers' dissatisfaction will lead to avoidance behaviour regarding product purchase intention and OPR continued use intention. This is because they perceive that OPR is not helpful in improving decision quality and also require extra cognitive effort for searching and screening alternate products in order to make a final choice. Furthermore, several past studies (Ayanso et al., 2015; Burton, Sheather, & Roberts, 2003; Lee, 2014; Thong et al., 2006; Zheng, Zhao, & Stylianou, 2013) found that customer satisfaction has positive impact on users' IS continuous usage intention. For example, Lee (2010) found that satisfaction has significant positive impact on users' continued use of e-learning system.

However, it is viable to examine the impact of OPR performance in terms of reduced decision effort, improved decision quality and higher satisfaction, on consumers' OPR continuous usage intention. Therefore, following hypothesis is derived:

H_1: Perceived OPR performance positively influence consumers' OPR continuous usage intention

3.2.2. Relationship between Consumers' Instrumental Beliefs and Perceived OPR Performance

Instrumental beliefs refer to consumers' perceived ease of use and perceived usefulness of OPR (Benlian et al., 2012). Benlian et al. (2012) used perceived ease of use and perceived usefulness as instrumental beliefs to examine the differential impact of system recommendations and consumer reviews. They found that perceived ease of use and perceived usefulness play an important role in the evaluation of OPR. Moreover, the technology post-adoption literature also identified that these instrumental factors play a salient role in users' acceptance of technology (Lee, 2010; Thong et al., 2006). Therefore, this study included perceived ease of use and perceived usefulness as instrumental beliefs to investigate their impacts on consumers' perception of OPR performance. Perceived ease of use refers to the extent to which consumers perceive that OPR is easy to use in evaluating products (Benlian et al., 2012). When OPR is perceived easy to use, then the OPR usage most likely results in reduced decision effort, greater decision quality and increased satisfaction with OPR.

Huang et al. (2013) reported that a person considers a piece of information diagnostic when it is easy to comprehend in making an effective decision. The evaluation of product attributes depends on customers' perception of OPR's comprehension difficulty, whether OPR is easy or difficult to use in visualizing products (Huang et al., 2013). When a customer perceives that OPR is easy to use in making judgement of a particular product, then its usage would result in less exertion on decision effort and greater decision effectiveness in product choice, and vice versa.

Moreover, OPR consists of pros and cons of alternative products which provide convenience to customers in understanding product quality. This convenience of OPR usage could leads to exert less decision effort, improve decision quality, and satisfaction. It is consistent with view of Huang et al. (2013) and Benlian et al. (2012) that two-sided information of product leads to greater product comprehension and judgement. Several empirical studies (Senecal and Nantel, 2004; Häubl and Trifts, 2000) reported that OPR provide convenience to cope with the overwhelming product choices and information available on e-commerce platform. Additionally, due to limited cognitive capacity, customers prefer information that is easy to comprehend and requires less exertion of decision effort. As OPR provides a concise set of related products, this manageable set of products is examined in detail for arriving at a buying decision. The clear and understandable presentation of recommendation most likely result in less decision effort and improved decision quality.

Furthermore, Bhattacherjee (2001b) excluded perceived ease of use from IS continuance model based on the argument that ease of use has an inconsistent effect on consumers' attitude in the initial stages, which seems to further subside and become non-significant in later stages (p.256). Later, various studies (e.g. Lee, 2010; Thong et al., 2006) conducted in different contexts found that perceived ease of use is an important post-adoption expectation for predicting satisfaction and IS continued use intention. For example, Thong et al. (2006) found that perceived ease of use as a post-adoption expectation has significant impacts on users' satisfaction and intention to continue using mobile internet service. Whereas, Huang et al. (2013) reported that perceived ease of OPR comprehension has an impact on the customers' decision making process. Therefore, due to inconclusive results in the prior literatures, it is worth to further examine the influence of perceived ease of use on the OPR's performance in terms of lower decision effort,

greater decision quality, and higher satisfaction. Following that, the hypothesis is formulated as:

H_2: Perceived ease of use has a positive impact on consumers' perceived OPR performance (i.e. reduced decision effort, and increased decision quality and satisfaction).

Since online customers strive to enhance the effectiveness of their decision due to their inability to touch or experience the product before buying (Xiao & Benbasat, 2007), OPR help them in better evaluating product attributes and subsequently it influences their decision making effort and buying decisions quality (Häubl & Trifts, 2000; Kumar & Benbasat, 2006). However, the customers' perceived usefulness of OPR could influence their decision effort exerted and buying decision quality as a result of OPR usage. Perceived usefulness is defined as "*the degree to which a customer believes that using an OPR would enhance his or her performance of product evaluation*" (Benlian et al., 2012).

Perceived usefulness is an important construct of IS continuance model, which has been highly validated and shown consistent predictability of different IT enabled services in adoption and post-adoption contexts. Majority of the past studies (e.g. Bhattacherjee, 2001b; Karahanna et al., 1999; Lee, 2010; Thong et al., 2006) have used perceived usefulness to examine its impact on satisfaction and behavioural continuous usage intention. These empirical studies reported that perceived usefulness remains an important predicting factor in IS post-adoption after its initial acceptance, because it has direct significant impact on users' satisfaction. In the context of online buying, no study is done to examine the direct impact of perceived usefulness on decision effort and decision quality (Seo et al., 2013). Therefore, based on IS continuance model and effort-

accuracy model, it is asserted that perceived usefulness of OPR has impact on consumers' OPR performance in terms of lower decision effort, greater decision quality and higher satisfaction.

It is argued that when a given OPR fits between the relevant tasks and buying performance, then it leads the customer's perception of OPRs usefulness. Then, the OPR enables customers to find the right-fitted products quickly through their improved judgement about product quality. This perceived usefulness of OPR usage most probably will result in improved buying decision effectiveness and satisfaction as OPR usage outcomes. It is also consistent with cognitive fit theory (Vessey, 1991), if there is a good fit between the task and the information provided (i.e. OPRs), then it results in more efficiency and effectiveness, exhibited as increased buying decision accuracy and satisfaction. In addition to that, the theory of human information processing (Simon, 1955) asserts that consumers minimize their cognitive load in decisions process with the help of a two-stage decision process (Kumar & Benbasat, 2006). In the first stage, OPRs enable customers to have a manageable set of alternative products. In the second stage, OPRs let customers evaluate this reduced set of products in depth before arriving at a final choice of the product.

In the context of IS adoption, prior studies have found the impact of perceived usefulness on decision quality and satisfaction. For instances, Seddon (1997) reported in re-specification of Maclean and Delean Model of IS success that perceived usefulness is one of the major antecedents of user satisfaction. Raghunathan (1999) also reported that customers' perception of usefulness in information quality leads to decision effectiveness. Venkatesh (2000) and Venkatesh and Davis (2000) found that the perceived usefulness of DSS influences the users' output quality and satisfaction. Devaraj, Fan, and Kohli

(2002) investigated customers' satisfaction in the e-commerce context and reported that perceived usefulness has significant positive impact on consumer satisfaction. Whereas, Seo et al. (2013) investigated that decision making based on ubiquitous mobility context and reported that perceived usefulness of DSS improved users' decision making efficiency and positively contributed to the decision quality. Recently, Xu et al. (2014) conducted an experimental study on product recommender system and found that consumers' perception of higher product diagnosticity leads to lower exertion of decision effort and higher decision quality. Therefore, in align with these studies, it is expected that perceived OPR usefulness has impact on consumers' perception of OPR performance in terms of lower decision effort, greater decision quality, and higher satisfaction. Hence, in order to test the relationship, the following hypothesis is derived:

H_3: Perceived usefulness of OPR positively influence consumers' perceived OPR performance (i.e. reduced decision effort, and increased decision quality and satisfaction).

3.2.3. Relationship between Consumers' Social-Psychological Beliefs and Perceived OPR Performance

According to Allport and Lindzey (1959), social-psychological factors that lead us to behave in a given way in the presence of others, and to look at the conditions under which certain behaviour/actions and feelings occur. The social-psychological factor refers to consumers' perception towards using a system is influenced by others' presence (Allport & Lindzey, 1959). This study included two social-psychological factors: perceived confirmation of expectations and trusting belief. These two factors have been used frequently in IS adoption literatures [for perceived confirmation, see (Bhattacherjee,

2001b; Lee & Kwon, 2011; Thong et al., 2006), and for trusting belief, see (Benbasat & Wang, 2005; Benlian et al., 2012; Komiak & Benbasat, 2006)]. Perceived confirm is one of the major constructs from IS continuance model and it is defined as "*users' perception of the congruence between expectation of technology use and its actual performance*" (Bhattacherjee, 2001b).

The IS continuance model asserts that expectations act as a benchmark against expectation-confirmation is assessed by the IS users in order to determine their level of evaluative response or satisfaction (Bhattacherjee, 2001b). Bhattacherjee (2001b) argued that perceived confirmation is positively related to individuals' satisfaction. Whereas, perceived confirmation indicates the recognition of expected benefits in using IS, and satisfaction is a higher affective state reflected as satisfied, indifferent, or dissatisfied feeling resulting from a cognitive appraisal of perceived confirmation (Bhattacherjee, 2001b) which implies that the higher (lower) confirmation causes higher (lower) satisfaction, in turn leads higher (lower) continuous usage intention. This affective feeling as attitude has also been theorized in TAM based studies which provides indirect support for satisfaction-continuous usage intention (Bhattacherjee, 2001b).

Another predictor of OPR continuous usage is decision effort exerted by the consumers while making buying decision (Huang et al., 2013). An IS that is perceived easier to use in task performance will be used continuously as compared an IS that is perceived difficult to use (Thong et al., 2006). Similarly, an OPR that requires less decision effort in product evaluation and to arrive at a buying decision would be used continuously as compared an OPR that requires extra decision effort. Thus, a similar reasoning would be applied while investigating the relationship between customers' perceived confirmation and decision effort. It is expected that the level of confirmation also might negatively

influence the perceived decision effort. That is, as customers gain confirmation experience with OPR usage, the customers' perception of decision effort is updated and become more concrete in determining OPR's continued use.

Although many empirical studies have investigated the impact of perceived confirmation on various post-adoption factors (e.g. usefulness, ease use, enjoyment, satisfaction) in various technological contexts, in the context of OPRs, no empirical study has directly investigated the effects of consumers' perceived confirmation on their perception of decision effort exerted and decision quality achieved. Therefore, this study further extends the IS continuance model by clarifying the understanding regarding consequences of perceived confirmation. Because, various prior studies (Komiak & Benbasat, 2006; Wang & Benbasat, 2004; West et al., 1999; Xiao & Benbasat, 2007) also have highlighted the importance of considering and managing customers' expectations in the design of OPR. They argued that customers might stop using OPR, when it does not fulfil their expectations of making better buying decision. Komiak, Wang, and Benbasat (2005); and Wang and Benbasat (2004) found that consumers often got disappointed with online recommendations due to their expectation-disconfirmation towards broaden their horizon and effective buying decision. Since consumers' perception of expectation-confirmation could influence the OPR performance with respect to decision effort, decision quality, and satisfaction, this study derived following hypothesis for empirical testing.

H_4: Perceived confirmation has positive impact on consumers' perceived OPR performance (i.e. reduced decision effort, and increased decision quality and satisfaction).

Theory of social response to computer argued that people respond socially to technological artefacts and perceive that they possess human characteristics (e.g. motivation, integrity, and personality) (Reeves & Nass, 1997). Further, Jian et al. (2000) found that components of trust in humans and in technological artefacts do not differ significantly. This indicates that people not only utilize them as decision aid tools, but also form social and trusting relationships with them (Benbasat & Wang, 2005). Moreover, consumers' trust plays key role in the success of online business as they are unable to touch, feel, and experience the product before actual buying (Kim et al., 2009; Xiao & Benbasat, 2007).

In the context of online recommendations (i.e. OPRs), Benbasat and Wang (2005) reported that consumers' trust on OPRs should correlate with other consumer beliefs (e.g. trust) and be able to determine consumer behavioural response towards OPR adoptions. Past researches (e.g. Benbasat & Wang, 2005; Benlian et al., 2012) used three characteristics to represent the trusting beliefs on OPR: competence, benevolence, and integrity. Customers trusting belief is that OPR has the ability and expertise as well as adherence to honest, truthful, and objective recommendations practices (Komiak & Benbasat, 2006) which are not detrimental to customers (Xiao & Benbasat, 2011). If consumers perceive OPRs' competence, benevolence, and integrity to be sufficient in facilitating online buying decision, then their trusting belief towards OPR usage will most likely lead them to perceive less decision effort exerted while arriving at an effective and satisfying buying decision. However, consistent with the argument of Benbasat and Wang (2005), this study asserted that consumers' trust in competence, benevolence, and integrity of OPR could be related to the OPR's performance in terms of decision effort exerted, decision quality, and satisfaction. Empirical testing is needed regarding whether or not trusting beliefs hold true for consumers' perception of OPR performance.

Several past studies (Benbasat & Wang, 2005; Benlian et al., 2012; Kim et al., 2008, 2009; Komiak & Benbasat, 2006; Pavlou, 2003; Qiu & Benbasat, 2009) have found that a customer's trusting belief in e-commerce vendors and OPR has important direct or indirect (e.g. via perceived usefulness, perceived risk, or satisfaction) influence on adoption intention. The findings of these studies revealed that consumers' various beliefs influenced by their degree of trusting belief in OPR usage. For example, if consumers trust that OPR is honest and unbiased in providing relevant products that match their preference, then they will perceive OPR useful and their usage may result in lower decision effort and improved decision quality. Moreover, customers' trust is developed and adjusted over a period of time by positive or negative experiences with the OPR usage. Positive experience results in higher decision quality and satisfaction (Kim et al., 2009). In contrast to that, if the OPR is not considered trustworthy in terms of competence, benevolence, and integrity, then customers may perceive exertion of increased decision effort, decreased decision quality, and lower satisfaction.

Furthermore, a number of past studies (Balasubramanian, Konana, & Menon, 2003; Kim et al., 2009) found that trust is an important factor in creating satisfied and loyal customers. For example, Kim, et al., (2009) investigated the relationship between trust and satisfaction in the context of e-commerce and reported that trust has indirect impact on customer's e-loyalty through satisfaction. Furthermore, it is supported with Festinger's cognitive dissonance theory (Festinger, 1962) which elaborates the relationship between customer trust and satisfaction while striving for harmony in their perception, values, and beliefs, and reported that satisfaction is likely to be higher, when trust is higher and lower when trust is lower. Since less studies were conducted in this study context, it would be interesting to examine the impact of consumers' trusting belief on their perception of OPR

performance. The underlying argument is that consumers' trusting belief in the competence, benevolence, and integrity of OPR would results in lower decision effort exerted, decision quality, and satisfaction. Therefore, following hypothesis is postulated as:

H_5: Trusting belief in OPR positively affect consumers' perceived OPR performance (i.e. reduced decision effort, and increased decision quality and satisfaction).

3.2.4. Relationship between Consumers' Affective Belief and Perceived OPR Performance

Affective belief refers to an individual's emotional or pleasant response when interacting with an environmental stimulus (Sun & Zhang, 2006). To represent consumer's affective belief, this study included perceived enjoyment that refers to whether or not his or her interaction with the OPR is fun, pleasant, entertaining, or interesting (Kamis et al., 2008; Koufaris, 2002; Xu et al., 2014). The IS literature has frequently studied perceived enjoyment to capture users' affective feelings, and found that perceived enjoyment is an important component of individual's affective belief (Kamis et al., 2008; Koufaris, 2002; Sun & Zhang, 2008; Van der Heijden, 2004; Xu et al., 2014; Xu et al., 2013). Subsequently, this study attempts to examine the role of perceived enjoyment in predicting OPR performance. It is argued that if a customer perceiving OPR to be interesting, energizing, and pleasant, then OPR usage would more likely to result in less decision effort, higher decision quality, and satisfaction. Customers' interaction with OPR usage would provide enjoyment, which subsequently may result in less decision effort, greater decision quality and satisfaction. The rationale is that when a customer is in a state of pleasant feeling and enjoyable mood with the OPR, then he or she perceives

to exert less cognitive effort to process OPR information to arrive at effective buying decision. Another argument consistent with the findings of past studies (Agarwal & Karahanna, 2000; Venkatesh & Davis, 2000) states that when customers perceive higher enjoyment with OPR usage, it leads them to ignore the difficulty associated with the usage. Consequently, it motivates customers to effectively evaluate the recommended products, which results in lower decision effort and improved decision quality. Contradictorily, if customers perceive OPR as unpleasant, dissatisfying, repulsive, and uncomfortable, then OPR usage results in greater decision effort, lower confidence in decision and consequently lower satisfaction with the OPRs use.

Furthermore, individual's pleasant perceptual processes play an important role in assessing the qualities of an object as future prospects and its applicability to one's goals (Zhang & Li, 2005), since decision making effort, decision quality, and satisfaction are directly related to customers' goals in using OPR that may be influenced by their pleasant perception with OPR usage. Recently, Xu et al. (2014) conducted a study and reported that perceived enjoyment has direct impact on customer's decision effort and decision quality. They argued based on past findings (e.g. Agarwal & Karahanna, 2000) that a customer is less able to notice the passing of time while in a state of deep involvement and interaction with OPR. It results in decreased decision effort due to underestimating the difficulty associated with OPRs use based on its interesting and appealing features.

In various study context, past researches reported that perceived enjoyment has positive impact on the customers' likelihood of returning to a website (Koufaris, 2002), attitude and satisfaction with a system interface (Griffith et al., 2001; Jiang & Benbasat, 2007b), behavioural reuse intention (Van der Heijden, 2004), and e-loyalty (Cyr et al., 2009). Griffith et al. (2001) argued that individuals process information more actively, when

they perceive greater enjoyment. The active processing of information most likely results in effective decision making and lower cognitive effort exerted. In contrast to that, consumers' unpleasant perception of OPRs results in increased decision effort and decreased decision quality (Xu et al., 2014). Consistent with these findings, it is expected that customers' perception of enjoyment positively influence OPR performance with respect to lower decision effort exerted, greater decision quality, and higher satisfaction. Accordingly, the following hypothesis is formulated:

H_6: Perceived enjoyment positively influence consumers' perceived OPR performance (i.e. reduced decision effort, and increased decision quality and satisfaction).

3.3. Control Variable: Product Type

In this study, product type is used as control variable, because several past studies (e.g. Benlian et al., 2010, 2012; Huang et al., 2013; Mudambi & Schuff, 2010) have reported that product type has significant moderating impact on the relationship between OPR usage and consumers' evaluation beliefs. In the perspective of pre-purchase performance veracity, products can be classified into two product types: search and experience (Nelson, 1970; Willemsen, Neijens, Bronner, & de Ridder, 2011). According to Huang et al. (2013), an important difference between these two types of products (search and experience) is whether a customer can evaluate the product quality before experiencing it. Search products, such as laptop (Huang et al., 2013), or electronics (Willemsen et al., 2011), are the products that can be correctly evaluated before purchase because they are characterized by functional and concrete attributes for which valid information can be acquired prior to actual product usage. Experience products, such as shoes (Huang et al.,

2013) or recreational services (Willemsen et al., 2011), are the products that are difficult to accurately be evaluated before purchase, because they are dominated by intangible attributes which cannot be known until using or experiencing the products. Consequently, purchasing different types of products require related information which assists in scrutiny and diagnosticity of products. However, a purchase decision on a search product as compared to an experience product that contains extrinsic attributes, depends more on "hard data" (i.e. attributes) than on "soft data" (i.e. experience) (Bei et al., 2004). In other words, experience products depend on soft data and require experience based information for accurately evaluating the products. Moreover, customer spend a greater depth but smaller breath of information search for experience products than for search products (Huang, Lurie, & Mitra, 2009). Franke, Huhmann, and Mothersbaugh (2004) found that the level of comprehending advertising content varies with the product type and that the similar level of advertising information is considered as being more informative for search products than for experience products. These researches provide evidences on the moderating impact of product type on information processing and comprehension (Benlian et al., 2012; Lin, 2014). Therefore, it is important to use product type as control variable.

3.4. Summary

The current chapter presented the research model and hypotheses developed in addressing the problem statement and research questions. First section deals with the development of research model and justification of incorporating the constructs. The research model developed based on three types of constructs: (1) consumers' evaluation beliefs, (2) OPR performance in terms of usage outcomes, and (3) consumers behavioural response. Second section presented hypotheses development. Based on the research model, six major hypotheses were developed: one hypothesis showing the impact of OPR's performance on OPR's continuous usage intention, and remaining five hypothesis related to the relationship between consumers' evaluation beliefs and OPR performance. The following Chapter 4 elaborates the research design, where research paradigm associated with this study and the research methods used in this study are discussed in detail.

CHAPTER 4

RESEARCH METHODOLOGY

4. Introduction

This chapter aims at presenting the research method used in this study. This Chapter is divided into three sections. First section presents an overview of the research design, research paradigm, and methodology used in this study. In addition, it also provides an overview of the research process. Research process comprises three phases: (1) research model and measures development, (2) a field study survey, and (3) the study outcome and conclusion. Second section discusses the measurement development and validation process including expert panel, pre-testing, and pilot study. Third section provides details on the field survey, including target population, unit of analysis, sampling frame, sampling method, and sample size used in the study are explained. In addition to that, questionnaire design, online survey, and finally details in selecting the suitable data analysis technique for this study are presented.

4.1. Research Design

Each research has a purpose, and appropriate research methods must be chosen in order to achieve the study purpose. A research design is framework for conducting the research. No matter what we want to find out, there are several ways of doing it (Babbie, 2007, p. 87). Research design explains the procedures necessary for obtaining required information to conduct the research and solve the underlying research problem. Although a broad research approach is already developed in order to investigate the research problem, research design details implementation of the research approach. Yin (2011)

reported that each study has implicit or explicit research design. It is important for any researcher to form a plan of how research questions will be answered (Saunders, Saunders, Lewis, & Thornhill, 2011, p.136). There are various procedures recommended by different authors in order to select an appropriate research design. For example, Sarantakos (1998) suggested three steps for selecting the appropriate research design: (1) select an appropriate research paradigm, (2) select an appropriate approach, and (3) select a set of methods. Therefore, following the recommended three-steps procedures of research design, the current study included selection of research paradigm, selection of a research approach, and selection of a research methodology.

4.1.1. Research Paradigm

Philosophical views remain largely hidden in a research endeavours and researchers use them as guidelines whenever they conduct research project (Creswell & Clark, 2007). It is necessary for the researchers to demonstrate their philosophical beliefs regarding the nature of the study. Alexander (2003) argued that the way the researchers view the world will have influence on the research topics and phenomena, the data collection techniques, and the means by which outcomes are understood. These beliefs will help them to explain why they have chosen qualitative, quantitative, or mixed methods for their research project (Creswell & Clark, 2007). Creswell and Clark (2007) use the term worldviews as meaning "*a basic set of beliefs that guide action*" (p. 6). Whereas others have called them *research paradigms* (Guba & Lincoln, 2000; Mertens, 1998); *epistemologies* and *ontologies (Crotty, 1998)*, or *broadly conceived research methodologies* (Neuman & Wiegand, 2000). According to these authors, research paradigms consist of stances adopted on each of element comprising ontology, epistemology, and methodology.

Ontology is an explicit specification of a conceptualization of underlying phenomena, and it is essentially the beginning point of all studies, after that epistemological and methodological stances are logically fallowed (Grix, 2002). Ontology is a philosophical assumption about the nature of reality (Creswell & Clark, 2007; Saunders et al., 2011) and captures one's belief about the way the world exist and operates (Saunders et al., 2011). Blaikie (2009, p.8) defined ontology as "*claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up, and how these units interact with each other*". These ontological assumptions refer to our belief about what constitutes a social reality, and determines how individuals conduct their researches and the interpretation of data collected (Saunders et al., 2011).

Epistemology refers to the philosophy of knowledge; how we come to know what we know (Grix, 2002). It concerns about what constitutes are acceptable knowledge in a field of study (Saunders et al., 2011). Epistemology emphasizes on the knowledge-gathering process and is concerned with developing new models or theories that are better than competing models or theories (Grix, 2002). Furthermore, Grix (2002) explained two contrasting epistemological positions: positivism and interpretivism. Positivism refers to an epistemological position that advocates the application of methods of natural sciences to the study of social phenomena or reality. In contrast, interpretivism is an epistemological position refers to *a strategy that respects the differences between people and the objects of the natural sciences, and therefore requires the social scientist to grasp the subjective meaning of social action*" (Bryman, 2012, p. 12-13). Thus, it is clear that selecting one of these epistemological positions will lead one to employ a different research methodology. Methodology is the collection of methods, principles, and values underpinning a particular research (Mackenzie & Knipe, 2006).

Creswell (2013) discussed four different research paradigms: positivism, constructivism, participatory, and pragmatism. These paradigms differ in terms of the nature of reality (ontology), the nature of knowledge (epistemology), and the process of research (methodology) as depicted in Table 4.1. These four research paradigm are briefly discussed accordingly.

Table 4.1: Elements of Research Paradigm and Implications for Practice

Worldview Element	Positivism	Constructivism	Participatory	Pragmatism
Ontology (What is the nature of reality?)	**Singular reality (e.g. researchers reject or fail to reject hypotheses)**	Multiple realities (e.g. researchers provide quotes to illustrate different perspectives)	Political reality (e.g. findings are negotiated with participants)	Singular and multiple realities (e.g. researchers test hypotheses and provide multiple perspectives)
Epistemology (What is the relationship between the researcher and that being researched?)	**Distance and impartiality (e.g. researchers objectively collect data on instruments)**	Closeness (e.g. researchers visit participants at sites and collect data)	Collaboration (e.g. researchers actively involve participants as collaborators)	Practicality (e.g. researchers collect data by "what works" to address research questions)
Axiology (What is the role of values?)	**Unbiased (e.g. researchers use checks to eliminate bias)**	Biased (e.g. researchers actively talk about their biases and interpretations)	Negotiated (e.g. researchers negotiate their biases with participants)	Multiple stances (e.g. researchers include both biased and unbiased perspective)
Methodology (What is the process of research?)	**Deductive (e.g. researchers test an a priori theory)**	Inductive (e.g. researchers start with the participants' views and build "up" to patterns, theories and generalizations)	Participatory (e.g. researchers involve participants in all stages of the research and engage in cyclical reviews of results)	Combining (e.g. researchers collect both quantitative and qualitative data and mix them)
Rhetoric (What is the language of the research?)	**Formal style (e.g. researchers use agreed-on definitions of variables)**	Informal style (e.g. researchers write in a literary informal style)	Advocacy and change (e.g. researchers use language that will help bring about change and advocate for participants)	Formal or informal (e.g. researchers may employ both formal and informal styles of writing)

Source: Creswell (2013)

The positivism research paradigm often referred as traditional form of scientific method, holds true more for quantitative research than for qualitative research, and is also known as positivist/post-positivist research, empirical science, and post-positivism (Creswell, 2013). Ontologically, positivists have a tendency to view reality as singular; using a theory to explain a single reality. They hold a deterministic philosophy; reflect the need to identify and assess the causes that influence outcomes. They also hold a reductionist view in which ideas are reduced into a small, discrete set of ideas to test, such as variables that consist of hypotheses and research questions. The knowledge developed by positivist researchers is based on an empirical observation and measurement of the objective reality. Researchers objectively collect data to further refine the established theories in order to better understand the reality or phenomena. With regards to the methodological approach, a researcher works from top-down (deductive approach), and begins with a theory, collects data that either supports or contradict the theory.

The social constructivist research paradigm is often combined with interpretivism (Mertens, 1998), and is usually applied to qualitative research (Creswell, 2013). In this research paradigm, meaning and understanding of the phenomena of interest is formulated through participants and their subjective views. There are multiple participant meanings as individuals develop subjective meanings of their experiences. Researchers depend on the participants' opinions about social reality. Questions posed to the participants are broad and open-ended, so that they can construct the meaning of a phenomenon (Creswell & Clark, 2007). With regards to theory generation, instead of beginning with an existing theory as in the case of positivism, the researchers inductively develop pattern of meaning or a theory. Therefore, constructivists are intended to use a "bottom up" inductive approach, by building and developing broader themes and produce a theory that interconnects these themes.

Participatory paradigm advocates an action agenda to help marginalised individuals (Creswell, 2013). The supporters of this paradigm claim knowledge through participatory approach, with the need to improve society. They assert that issues such as empowerment, marginalization, hegemony, patriarchy, etc. required to be addressed. This paradigm is mostly used in qualitative research, but it can be applied in quantitative research as well. Methodologically, the researchers actively participate as collaborators and involve participants in all stages of the research and engage in cyclical reviews of results.

Pragmatic research paradigm is a deconstructive paradigm and primarily emphases on "what works" as the truth concerning the research question under investigation (Teddlie & Tashakkori, 2003). Pragmatism focuses on a pluralistic approach for deriving knowledge about problem and consequences of the research, with primary focus on the research question rather than the methodology of the study (Creswell, 2013). Ontologically, pragmatists view a reality as both singular and multiple. By viewing it as singular, it advocates that there may be a theory that explains the phenomena, whereas by viewing it as multiple, varied individual inputs can be evaluated to understand the nature of the phenomenon. Methodologically, researchers collect both quantitative and qualitative data and mix them.

Based on the understanding of various research paradigms and fitting best with the study purpose, this study follows positivist view as the most appropriate research paradigm for carrying out the research process. The primary objective of this research is to identify salient determinants of OPR continuous usage intention and how they influence the dependent variable. Quite simply, OPR continuous usage intention refers to the consumers' behavioural response that can objectively be measured by employing standard scientific methods of positivist paradigm. Ontologically the phenomenon 'OPR continuous usage' consists of discrete and observable elements. Consumers interact with

the OPR in an observable, determined and regular manner. The interaction with OPR leads consumers to develop various instrumental, social-psychological, and affective beliefs of OPR evaluation influencing consumers' perceived OPR performance which subsequently determine their OPR continuance intention for future purchase. The positivist paradigm allows the researcher to operationalize the consumers' beliefs/perceptions and behavioral intention for measuring them. Following the hypothetico-deductive approach explained under the positivist paradigm, this study empirically examines the cause and effect relationship among study constructs for predicting consumers' OPR continuous usage. The deductive approach involves the use of existing theory to develop hypotheses to be tested during the research process. However, this study integrates four theoretical models in order to propose research model and develop six main hypotheses in align with the research objectives. Quantitative methodology which is also explained under positivism, is considered appropriate for collecting and using the quantitative data through survey questionnaire for statistically testing the hypotheses. Moreover, a fundamental principle of positivist paradigm is the researcher's independence in terms of minimum interaction with the study respondents while carrying out the field survey. Additionally, results are judged only by logic rather than common sense. Consequently, the researcher's adhesion to the positivist assumptions to the research findings that are quantifiable and considered as acceptable knowledge. Using the positivist paradigm, this study identifies and examines key instrumental, social-psychological, and affective beliefs of OPR evaluation influencing consumers' perceived OPR performance that subsequently determine their OPR continuous usage intention. In align with the positivist paradigm, this study employs quantitative deductive approach to objectively examine the role of OPR evaluation beliefs and OPR performance in predicting consumers' OPR continuance intention for future

purchase. The next sub-sections will therefore elaborate research approach and quantitative methodology used in this study.

4.1.2. Research Approach

There are two major research approaches: deduction and induction (Saunders et al., 2011). Deduction begins with a theory and hypotheses, and a research strategy is designed to test the hypothesis (or hypotheses). In contrast to that, induction starts with the collected data, and then a theory is developed from the findings based on the analysis of the data collected (Saunders et al., 2011). In order to make the decision that one's research should choose either deductive, inductive or both approaches, it is important to consider the nature and purpose of the research topic. If there is abundance of literature existing on the research topic for developing a research model and related hypotheses, then the research should render itself more readily to deduction (Saunders et al., 2011). On the other hand, if research topic is relatively new and there is paucity of existing literature on the topic, the best approach may be to inductively generate and analyse data to identify theoretical themes that emerge within the data (Saunders et al., 2011).

Considering the nature of the current study and the availability of existing literature on IS adoption and post-adoption, hypothetico-deductive approach was considered more appropriate in order to answer the research questions. This is because this study aims to identify what are the OPR evaluation factors influencing consumers' perception of OPR performance, which subsequently determine OPR continuous usage intention. This study conducted systematic grounded theory literature reviews over three stages of OPR adoption (see Appendix-B1). The content analysis of OPR studies was conducted to identify the gaps in literature. Similarly, content analysis was also done in order to

identify factors pertaining to particular OPR adoption. Due to the lack of studies on OPR continuous usage, further content analysis on IS studies in general was conducted to identify the factors pertaining to IS continuous usage intention. After identifying the most frequently used factors, an expert panel was consulted in order to get more insights in the selection of factors influencing the OPR continuous usage (see section 4.2.4). Based on the results of expert panel, the most appropriate and influential factors were identified. After constructing selection and referring literature reviews, four theories were integrated in order to develop the research model (see Figure 3.1). Subsequently, hypothetico-deductive approach was followed. This approach was involved a priori deduction of hypotheses from a theory or model and testing of those hypotheses using numerical data and statistical analysis. The quantitative part of this study is the correlation analysis that examine strength of the relationships between constructs (Teddlie & Tashakkori, 2009).

Having discussed the research approach which is the hypothetico-deductive approach applied in the current research, the next section determines the most appropriate research method used in this study.

4.1.3. Research Methodology

Research methods are normally divided into three categories: quantitative, qualitative, and mix methods (Teddlie & Tashakkori, 2009). Quantitative method is the most simply and parsimoniously defined as the techniques associated with gathering, analysis, interpretation, and presentation of numerical information. Quantitative method is explained under the positivist paradigm (Creswell, 2013). Qualitative methods may be referring to the techniques associated with the gathering, analysis, interpretation, and presentation of narrative information. Qualitative researchers often subscribe to

constructivist paradigm (Maxcy, 2003). Whereas, mix-method refers to the combination of qualitative and quantitative methods, and are used in various types of research questions, research methods, data collection, analysis procedures, and inferences (Teddlie & Tashakkori, 2003). Mix method is associated with the pragmatism paradigm (Bryman, 2012; Teddlie & Tashakkori, 2009). Teddlie and Tashakkori (2009) explained the differences among three methodologies by comparing them based on a number of dimensions as it is shown in Table 4.2.

Those researchers who use qualitative method are known as QUALs, while quantitative researchers known as QUANs, and the mix method researchers are known as mixed methodologists. Paradigm that is often related to qualitative method is constructivism, whereas quantitative research follows positivism, and mix method research is associated with either pragmatism or transformative depending on the nature of the study. Narrative data is used in qualitative research, whereas quantitative research uses typical numeric data, and both numeric and narrative data are used in mix method studies. Qualitative research is often exploratory in nature, while quantitative research is often confirmatory, and mix method research can be confirmatory or exploratory. Qualitative research is based on grounded theory or inductive logic, while quantitative research is based on conceptual framework and hypothetico-deductive logic, and mix method research follows both inductive and deductive approaches. Qualitative research uses mostly purposive sampling; thematic strategies for data analysis; and trustworthiness, credibility, transferability for validity. Quantitative study uses mostly probability sampling; descriptive and inferential techniques for data analysis; and internal and external validity for validity. Whereas, mix method study uses probability, purposive, and mix method for sampling; integration of thematic and statistical data for data analysis; and inference

quality and inference transferability for validity. A detail comparison of various dimensions among these three methodologies is shown in the following Table 4.2.

Table 4.2: Dimensions of Contrast among the Three Methodologies

Dimension of Contrast	Qualitative Position	Quantitative Position	Mix Method Position
Methods	Qualitative Method	**Quantitative method**	Mix methods
Researchers	QUALs	**QUANs**	Mix methodologies
Paradigms	Constructivism	**Positivism**	Pragmatism
Research Questions	QUAL research question	**QUAN research design, research hypotheses**	Multi-method research question (QUAL and QUAN)
Form of Data	Typical narrative	**Typical numerical**	Narrative plus numeric
Purpose of Research	Often exploratory plus confirmatory	**Often confirmatory plus exploratory**	Confirmatory plus exploratory
Role of Theory Logic	Grounded theory, inductive logic	**Rooted in conceptual framework or theory, hypothetico-deductive approach**	Both inductive and deductive logic
Typical Studies or Design	Ethnographic research design	**Correlational, survey, experimental**	Multi-method design; parallel and sequential
Sampling	Mostly purposive	**Mostly probability**	Probability, purposive, and mix method
Data Analysis	Thematic strategies; categorical and contextualization	**Statistical analysis: descriptive and inferential**	Integration of thematic and statistical; data conversion
Validity	Trustworthiness, credibility, transferability	**Internal validity, external validity**	Inference quality, inference transferability

Source:Teddlie and Tashakkori (2009)

In align with positivist paradigm and hypothesis-deductive approach, the current study used quantitative method to study the impact of evaluation beliefs and OPR performance on consumers OPR continuous usage intention. Using the quantitative method in this study, helped to develop a deeper understanding of antecedents of OPR continuous usage intention and to generate new theoretical insights. Moreover, a large number of empirical

studies have applied quantitative method (Venkatesh, Brown, & Bala, 2013). According to Johnson and Christensen (2008), quantitative method provides various benefits to the researchers as follows:

- It is useful when need to conduct a study on large numbers of people.
- It is convenient for obtaining data that is precise and numerical, and allows quantitative predictions to be made.
- Data collection using quantitative methods is relatively quick (e.g. online survey).
- Data analysis using statistical software is relatively less time consuming.
- Research findings are relatively independent of the researcher
- It allows to control various variables in order to examine cause-effect relationship.
- Testing and validating already established theories.
- Testing hypotheses that were developed prior to data collection.
- Generalizability of research findings.

Following the quantitative method, this study subscribes to positivist research paradigm. The study followed the hypothetico-deductive approach in order to answer the research questions. Accordingly, four theories were used to develop integrated research model and related research hypotheses. In order to develop research model, this study referred past literature and expert panel results for constructs selection. The research model was then tested using data collected through an online survey. The collected data was analysed using SPSS (version 20) and SmartPLS2 M3. SPSS was used for descriptive statistics analysis and partial least square (PLS) approach to structural equation modelling to gain further insights on the antecedents of OPR continuous usage intention. The use of online survey as a data collection technique offers benefits such as the ability to generalize the research findings about a population by drawing inferences based on data collected from

a small portion of that population (Rea & Parker, 2014). The target population of this study was the Amazon customers who relied on online product recommendations (OPRs) for their online buying decision (rest of the Amazon customers who do not use OPR were not considered in the target population of this study). Amazon was chosen as the study context because of three main reasons: (1) it is the first e-commerce platform in deploying OPRs and positive example for others e-retailers, (2) Amazon has publically disclosed the list of their verified customers that was used for conducting online survey, and (3) many past studies have been conducted in the context of Amazon.

The final research design is presented in Figure 4.1, comparing three main phases. Phase-I started with systematic review of the past literature in the context of information system in general and more specifically in OPR context. Based on the literature content analysis, factors pertaining to OPR's effectiveness and theories underpinning the phenomena were identified. Subsequently, research model was developed and appropriate measures were selected. Then expert panel, pre-testing, and pilot study were executed to provide further validation and stability before proceeding to phase II. Phase II commenced by surveying the research population, the data were collected through online survey with Amazon customers who used OPR for their buying decision. Then, statistical results were generated by executing analysis of measurement and structural models. Phase III consisted of final results, discussion, research implications, and conclusion of the study. Figure 4.1 depicted the research process of this study.

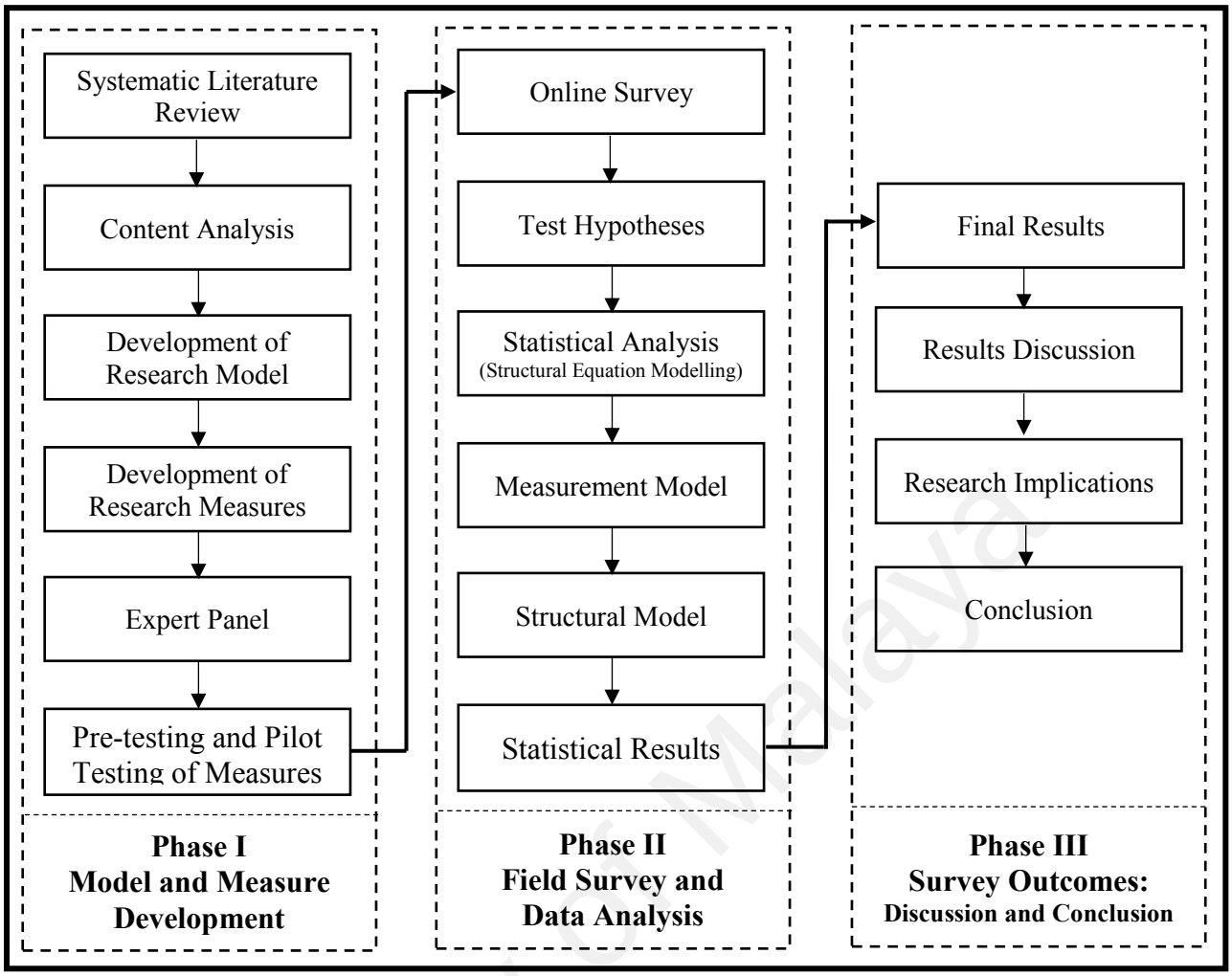


Figure 4.1: Research Design

4.2. Phase I: Research Model and Measure

In order to identify research gap and accordingly to develop research model, a systematic grounded theory literature review was conducted (See Appendix-B1). The content analysis of literature and research gap highlighted in this study were discussed thoroughly in Chapter 2. Based on content analysis and results of expert panel, the research model was developed and presented in Chapter 3. The following sections presented the development and validation of the study measures.

4.2.1. Measure Development and Validation

The researcher used a systematic way to develop the constructs of study. The past literature review formed the main basis for all proposed constructs' operationalization and causal relationships between them. Consequently, the constructs and related measurements were adopted from the previous literature, while chapter 2 explored the past literature in the disciplines of information system in general and OPR in particular. This study used both multi-items and multi-dimensions measures to evaluate the constructs employed in the research model, discussed in Chapter 3. Multi-items within each construct were developed and adopted from existing scales validated in the past IS studies. In this study, all items were measured using a 5-point Likert scale with anchors ranging from "1- strongly disagree" to "5-strongly agree", to evaluate all proposed constructs in the research model. For further validation, the constructs passed through construct-measurement validation stage by conducting an expert panel comprising academician, practitioners, and online customers, and its results presented in the following subsection.

The content analysis revealed that past IS studies have used two types of constructs: formative and reflective. A formative construct consists of composite of multiple measures that define or influence the construct, and in general, they may have positive, negative or even no correlation among each other (Freeze & Raschke, 2007). Thus, there is no need to examine indicator's reliability, internal consistency reliability, and discriminant validity, if a formative measurement scale is used (Wong, 2013). It is because outer loadings, composite reliability, and square root of average variance extracted (AVE) are meaningless for a formative construct made up of uncorrelated measures. As such, observed indicators are assumed not to be correlated with each other

or to represent the same underlying dimension (Chin, 2010), hence each indicator may exist independently of the others (Chin, Gopal, & Salisbury, 1997). A good example of formative measurement scale is cognitive trusting belief. Since it is a latent variable and often difficult to measure directly, researchers have to look at its different dimensions such as competence, benevolence, and integrity that can be measured. Here, it is obvious that each dimension is independent and not interchangeable.

On the other hand, reflective constructs have observed measures that are influenced by an underlying latent construct (Petter, Straub, & Rai, 2007). Changing the latent construct causes changes in the indicators (Hair, Ringle, & Sarstedt, 2011; Jarvis, MacKenzie, & Podsakoff, 2003). If the indicators are highly correlated, interchangeable, and deleting an indicator should not change the conceptual domain of the construct, they are reflective and their reliability and validity should be thoroughly examined (Haenlein & Kaplan, 2004; Hair Jr, Hult, Ringle, & Sarstedt, 2013; Jarvis et al., 2003; Petter et al., 2007). Their outer loadings, composite reliability, and AVE should be computed. Reflective constructs are common throughout the IS literature such as perceived ease of use, perceived usefulness, and satisfaction (Petter et al., 2007).

In order to distinguish between formative and reflective constructs in a model, the directionality of the arrows between the construct and its measures indicate whether the construct is formative or reflective (Wong, 2013). An arrow leading to the latent construct from its measures indicates formative constructs, while an arrow leading away from the latent construct toward its measures shows a reflective construct (Gefen, Straub, & Boudreau, 2000). If the construct is influenced by its indicators, then it is formative construct. Conversely, if the indicators are influenced by the construct, then it is reflective construct (Petter et al., 2007). The above discussion about the differences between formative and reflective constructs is important to determine how the research model is evaluated.

Researchers usually focus on the structural model more than the relationship between measures and their related constructs (Jarvis et al., 2003). Consequently, they treat all constructs in the same way regardless of whether a particular construct is formative or reflective (Chin, 1998; Jarvis et al., 2003). In fact, the relationship between constructs and their measures are viewed as hypotheses which require evaluation along with structural paths (Edwards & Bagozzi, 2000). Therefore, the misidentification of the formative and reflective constructs may lead to type-I and type-II error that may negatively influence the theory development due to inappropriate results (Edwards & Bagozzi, 2000). In order to determine the type of construct, Jarvis et al. (2003) listed the major four decision rules as depicted in Table 4.3.

Table 4.3: Decision Rules for Determining Whether a Construct is Formative or reflective

Rules	Formative model	Reflective model
1. Direction of causality from construct to measure implied by the conceptual definition. • Are the indicators (items) (a) defining characteristics or (b) manifestations of the construct? • Would changes in the indicators/items cause changes in the construct or not? • Would changes in the construct cause changes in the indicators**?**	• Direction of causality is from items to construct. • Indicators are defining characteristics of the construct. • Changes in the indicators should cause changes in the construct. • Changes in the construct do not cause changes in the indicators.	• Direction of causality is from construct to items. • Indicators are manifestations of the construct. • Changes in the indicator should not cause changes in the construct. • Changes in the construct do cause changes in the indicators.
2. Interchangeability of the indicators • Should the indicators have the same or similar content? • Do the indicators share a common theme? • Would dropping one of the indicators alter the conceptual domain of the construct?	• Indicators need not be interchangeable. • Indicators need not have the same or similar content. • Indicators need not share a common theme. • Dropping an indicator may alter the conceptual domain of the construct.	• Indicators should be interchangeable. • Indicators should have the same or similar content. • Indicators should share a common theme. • Dropping an indicator should not alter the conceptual domain of the construct
3. Covariation among the indicators • Should a change in one of the indicators be associated with changes in the other indicators? •	• Not necessary for indicators to covary with each other. • Not necessarily.	• Indicators are expected to covary with each other. • Yes.
4. *Nomological net of the construct indicators* • Are the indicators/items expected to have the same antecedents and consequences?	• Nomological net for the indicators may differ. • Indicators are not required to have the same antecedents and consequences.	• Nomological net for the indicators should not differ. • Indicators are required to have the same antecedents and consequences.

Source: Jarvis et al. (2003)

Based on the above discussion, the researcher follows the construct development process depicted in Figure 4.2. First, construct is defined, and then the validated measurements of the construct are listed based on literature and expert panel. Following that, the type of construct (formative or reflective) is identified based on the decision rules criteria suggested by Jarvis et al. (2003).

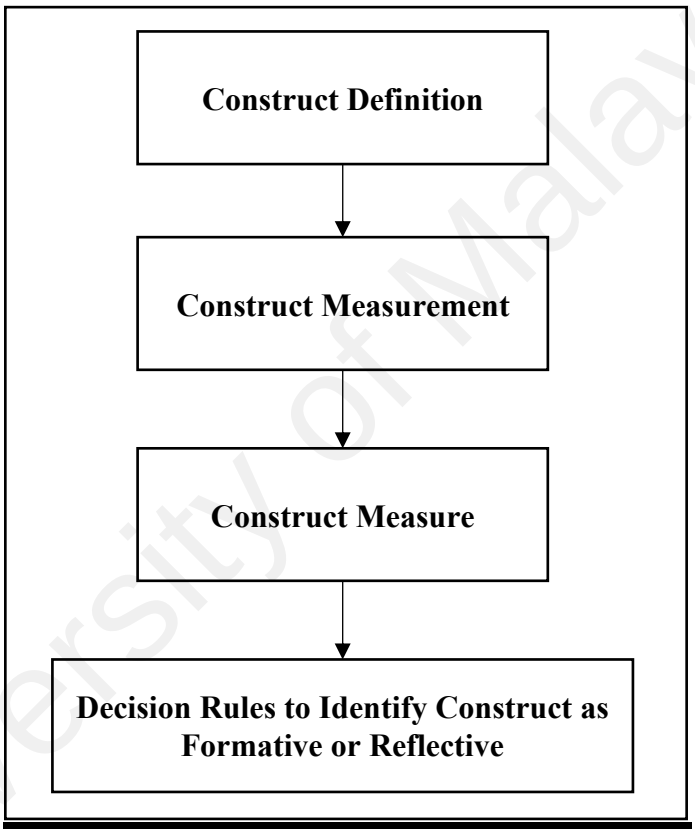


Figure 4.2: Construct Development Process

The list of the constructs used in the research model, their definitions, measurements, and relevant sources are shown in Table 4.4.

Table 4.4: Definition and Measurements of the Study Constructs

Construct	Definition	Measure	Source
OPR Continuous usage Intention	Customer's behavioural intention to continue using the similar type of OPR whenever he or she needed to buy a product in the future.	• Intention to continue using. • Plan to continue using. • Predict to continue using. • Continue to pay attention.	(Benlian et al., 2012; Bhattacherjee, 2001b)
OPR Performance	Customers' overall cognitive and affective assessment of OPR's capabilities effectively (or ineffectively) help them in making purchase decision. / Customers' perception of OPR performance.	Dimensions: • Decision Effort • Decision Quality • Satisfaction	(Bhattacherjee, 2001b; Xu et al., 2014)
Perceived Ease of Use	The degree to which a customer believes that the OPR is easy to use in making accurate judgement of the product.	• Easy for me. • Understandable. • Clear and simple. • Required less effort. • Required less time.	(Benlian et al., 2012; Huang et al., 2013)
Perceived Usefulness	The degree to which a person believes that using OPR would enhance his or her product evaluation performance	• Enabled me to evaluate • Assisted me to understand • Allowed me to analyse • Helpful in familiarizing • Enhanced the effectiveness	(Benlian et al., 2012)
Perceived Confirmation	Customers' perception of congruence between expectation of OPR use and its actual performance	• Experience with OPR was better than expected. • Service provided by OPR was better than expected. • Overall expectations were confirmed.	(Bhattacherjee, 2001b)
Trusting Belief	Customer's rational expectations that the OPR have the necessary attributes to be relied upon (Komiak & Benbasat, 2004). Or customers' cognitive evaluation of the OPR's trustworthiness.	Dimensions: • Competence • Benevolence • Integrity	(Benlian et al., 2012)
Perceived Enjoyment	The extent to which OPR usage is perceived to be enjoyable in its own right, apart from any performance consequences which may be expected.	• Enjoyable • Pleasurable • Pleasant • Entertaining • Fun	(Thong et al., 2006)

4.2.1.1. OPR Continuous Usage Intention

OPR continuous usage intention refers to customer's behavioural intention to continue using the similar type of OPR whenever he or she needed to buy a product in the future (Benlian et al., 2012; Bhattacherjee, 2001b). Originally, the continued use intention construct was adopted from IS continuance model and modified in align with the study of Benlian et al. (2012). Various past studies (e.g. Ayanso et al., 2015; Lee, 2010; Thong et al., 2006) have used the continuous usage intention as a dependent variable in order to examine post-adoption behaviour of IS users after their initial adoption. The main purpose of these studies were to investigate whether IS users will continue to use the target application after its initial acceptance. These studies used multi-items in order to conceptualize the continuous usage intention as a reflective construct. Accordingly, the current study adopts four items to measure OPR continuous usage intention depicted in Table 4.5.

Table 4.5: Items Used to Measure OPR Continuous usage Intention

#	Items
	If you needed to buy a similar type of product in the future, how likely is it that you would
1	….. Intend to continue using the similar type of OPR in the future?
2	….. Predict your use of the similar type of OPR to continue in the future?
3	….. Plan to continue using the similar type of OPR in the future?
4	….. Continue to pay attention to the similar type of OPR?

Source: (Benlian et al., 2012; Bhattacherjee, 2001b)

OPR continuous usage intention construct was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.986, which indicated good internal reliability (Chin, 2010; Hair et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the OPR continuous usage intention measure is presented in Table 4.6. Consistent with the past studies, the current study will consider OPR continuous usage intention as a first order reflective construct (Ayanso et al., 2015; Lee, 2010; Thong et al., 2006).

Table 4.6: Decision Rules to Identify OPR Continuous usage Intention Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	OPR Continuous usage Intention measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All items are interchangeable, all the items have the same content (intention to continue, plan to continue). Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The OPR continuous usage intention items covary, thus increase in the plan to continue using the OPR will lead the intention to continue use OPR.		√
Rule4: Nomological net of the construct indicators	All the items or indicators would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**OPR Continuous usage Intention is a first order reflective construct**		√

4.2.1.2. Perceived OPR Performance

Perceived OPR performance refers to customers' cognitive and affective assessment of OPR's capabilities effectively (or ineffectively) helping them in making purchase decision. In this study, OPR performance is measured in terms of its usage outcomes by adopting perceived decision effort and perceived decision quality from Xu et al. (2014) and customer satisfaction from Bhattacherjee (2001b). Xu et al. (2014) used perceived decision effort and perceived decision quality as reflective measures in order to examine the performance of product recommender. Moreover, several past studies (e.g. Häubl et al., 2004; Häubl & Murray, 2006; Häubl & Trifts, 2000; Xu et al., 2014) reported that the

customers' major objectives of using decision aid are to conserve decision effort and improve decision quality. Consequently, this study adopted perceived decision effort and perceived decision quality as cognitive assessment of OPR performance. In addition to that, this study included customers' overall satisfaction with OPR rather than decision satisfaction. There are two reasons to include the overall satisfaction as affective assessment of OPR performance. First, OPR performance related to decision making is already captured in customers' perception of decision effort and decision quality. Second, several IS studies (e.g. Lee, 2010; Thong et al., 2006) reported that overall satisfaction is a key predictor of IS continuous usage intention. Moreover, satisfaction plays important role in the examination of IS acceptance-discontinuous usage anomaly. Additionally, several past studies (e.g. Gatian, 1994; Gelderman, 1998; Griffiths et al., 2007; Sharabati, 2014) have used satisfaction as standard surrogate measure of performance. Therefore, in addition to satisfaction, this study included decision effort and decision quality as additional surrogate measures of OPR performance in terms of customers' OPR usage outcomes. Details on each dimensions of the OPR performance are presented in Table 4.7.

Table 4.7: Definition and Measurements of the OPR Performance Indicators

Construct	Definition	Measure	Source
Perceived Decision Effort	The extent to which cognitive effort exerted by the customer in processing OPR in order to arrive at his purchase decision.	• Frustrating. • Complex • Require a lot of effort • Required a lot of time	(Perera, 2000; Xu et al. (2014))
Perceived Decision Quality	The extent to which the customer has bought the recommended product that fit his needs or tastes.	• Suited my preferences • Best matched my needs. • Best choice to buy. • Helped me to avoid poor choice. • Helped me to make best decision possible.	Xu et al. (2014)
Satisfaction	An affect, captured as a positive (satisfied), indifferent, or negative (dissatisfied) feeling with OPR.	• Very satisfied • Very pleased • Very contended • Absolutely delighted	Bhattacherjee (2001b)

Based on the decision rules in Table 4.3 and construct measures analysis shown in Table 4.8, the current study employed OPR performance as a second-order formative construct consisting three dimensions: perceived decision effort, perceived decision quality, and satisfaction.

Table 4.8: Decision Rules to Identify OPR Performance Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	OPR performance construct indicators are defining the characteristics of the construct. Thus changing in the dimensions will cause change in the construct, and the change in the construct will not affect the dimensions.	√	
Rule2: Interchangeability of the indicators	Three dimensions are not interchangeable, the dimensions are distinct from each other. They are not representing the same content, e.g. decision effort is totally different from decision quality and satisfaction. Dropping any of the dimensions alter the conceptual domain of the construct.	√	
Rule3: Covariation among the indicators	The three dimensions are not necessary to covary with each other. For example, decrease in decision effort will not lead to any increase in decision quality and satisfaction.	√	
Rule4: Nomological net of the construct indicators	Each dimension would have the different antecedents and consequences as all of them reflect the different content.	√	
Final Decision	**OPR Performance is a second order formative construct**	√	

A. Perceived Decision Effort

Perceived decision effort refers the extent to which effort exerted by the customer in processing OPR in order to arrive at his purchase decision (Xu et al., 2014). Perceived decision effort measures were adopted from the study by Xu et al. (2014), who operationalized the measures by assessing the product selection task using the recommend system was complex, take much effort and time. Table 4.9 provides four items employed in the measurement of perceived decision effort.

Table 4.9: Items Used to Measure Perceived Decision Effort

#	Items
	The product selection task that I went through using the OPRs
1	….. Was frustrating
2	….. Was complex
3	….. Required a lot of effort
4	….. Took much time

Source:Xu et al. (2014)

Perceived decision effort dimension was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.5). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.932, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the perceived decision effort measure is displayed in Table 4.10. Consistent with the past studies by Xu et al. (2014) and Perera (2000), the current study will consider perceived decision effort as a first order reflective construct.

Table 4.10: Decision Rules to Identify Perceived Decision Effort Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Perceived decision effort measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurements are interchangeable, all the items have the same content that reflect the customer's perception cognitive effort exerted. Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The decision effort items covary with each other, they have the same content (frustrating, complex).		√
Rule4: Nomological net of the construct indicators	All the items or indicators would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Perceived Decision Effort is a first order reflective construct**		√

B. Perceived Decision Quality

Perceived decision quality refers the extent to which a customer has bought the recommended product that fit his or her needs or taste (Xu et al., 2014). Perceived decision quality measures were adopted from the study by Xu et al. (2014), who operationalized the measures by assessing OPR if the recommended product chosen fulfil the needs or preference. This study employed five items: two items selected from Xu et al. (2014) and three items included based on the recommendations of expert panel. Table 4.11 provides five items employed in the measurement of perceived decision quality.

Table 4.11: Items Used to Measure Perceived Decision Quality

#	Items
	The product chosen from alternatives recommended by OPRs, it
1	….. Suited my preferences.
2	….. Best matched my needs.
3	….. Best choice to buy.
4	….. Helped me to avoid poor choice.
5	….. Helped me to make best decision possible.

Source: items 1 and 2 (Xu et al., 2014), items 3, 4, and 5 (Expert panel)

Perceived decision quality dimension was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.939, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the perceived decision quality measure is displayed in Table 4.12. Consistent with the past study by Xu et al. (2014), this study will consider perceived decision quality as a first order reflective construct.

Table 4.12: Decision Rules to Identify Perceived Decision Quality Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Perceived decision quality measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurement are interchangeable, all the items have the same content (best choice to buy, best decision possible). Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The construct items covary with each other, they have the same content (suited my preferences, best match my needs, best choice to buy).		√
Rule4: Nomological net of the construct indicators	All the construct items would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Perceived decision quality is a first order reflective construct**		√

C. Satisfaction

Satisfaction refers to an affect, captured as a positive (satisfied), indifferent, or negative (dissatisfied) feeling with OPR (Bhattacherjee, 2001b). This study adopted satisfaction dimension from the study by Bhattacherjee (2001b), who operationalized the construct to measure individuals' overall satisfaction with the IS usage. Table 4.13 provides four items employed in the measurement of satisfaction.

Table 4.13: Items Used to Measure Satisfaction

#	Items
	How do you feel about your overall experience of OPR use?
1	Very dissatisfied/Very satisfied.
2	Very displeased/Very pleased.
3	Very frustrated/Very contented.
4	Absolutely terrible/Absolutely delighted.

Source: Bhattacherjee (2001b)

Satisfaction dimension was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.924, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the satisfaction measure is displayed in Table 4.14. Consistent with the past study by Bhattacherjee (2001b), this study will consider satisfaction as a first order reflective construct.

Table 4.14: Decision Rules to Identify Satisfaction Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Satisfaction dimension measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurements are interchangeable, all the items have the same content that reflect the customer's perception of satisfaction with the OPR. Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The satisfaction items covary with each other, they have the same content (very satisfied, very pleased, very contend).		√
Rule4: Nomological net of the construct indicators	All the measures would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Satisfaction is a first order reflective construct**		√

4.2.1.3.Perceived Ease Use

Perceived ease of use refers to the degree to which a customer believes that the OPR is easy to use in making accurate judgement of the product (Benlian et al., 2012). This study adopted perceived ease of use measure from Benlian et al. (2012) and Huang et al. (2013).

Benlian et al. (2012) used four items to measure the customers' interaction with OPR usage by assessing the ease of using OPR, ease of skilfulness, clarity of OPR. Huang et al. (2013) measure customers' interaction with consumer reviews by assessing the effort exerted in using consumer reviews for making buying decision. In order to measure perceived ease of use, this study adopted three measures from the study by Benlian et al. (2012) and two measures from the study by Huang et al. (2013). Table 4.15 shows five items used for measuring perceived ease of use.

Table 4.15: Items Used to Measure Perceived Ease of Use

#	**Items**
	To make an accurate product judgment, comprehending/using the OPR was
1	….. Easy for me.
2	….. Understandable.
3	….. Clear and simple.
4	….. Required less effort.
5	….. Required less time.

Source: items 1, 2, and 3 from Benlian et al. (2012), and items 4 and 5 from Huang et al. (2013)

Perceived ease of use was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.748, which indicates acceptable internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the perceived ease of use measure is displayed in Table 4.16. Consistent with the past study by Benlian et al. (2012), this study will consider perceived ease of use as a first order reflective construct.

Table 4.16: Decision Rules to Identify Perceived Ease of Use Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Perceived ease of use measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All items are interchangeable, all the measurements have the same content (clear and simple, easy of use). Moreover, dropping one the item will not affect the construct.		√
Rule3: Covariation among the indicators	The perceived ease of use items covary, thus increase in the easy to use OPR will lead the less time and effort to use OPR.		√
Rule4: Nomological net of the construct indicators	All the items or indicators would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Perceived Ease of Use is a first order reflective construct**		√

4.2.1.4. Perceived Usefulness

Perceived usefulness refers the degree to which a customer believes that using OPR would enhance his or her product evaluation performance (Benlian et al., 2012). This study adopted measurements of perceived usefulness from Benlian et al. (2012), who operationalized the measures by assessing OPR's effectiveness in facilitating customers' perception of product judgement. This study employed five items in order to measure customers' perception of OPR's usefulness concerning product evaluation. Out of five items, two items employed based on experts' recommendations and three items adopted from Benlian et al. (2012). Table 4.17 presents five items used for measuring perceived usefulness.

Table 4.17: Items Used to Measure Perceived Usefulness

#	Items
	Using the online product recommendation (OPR)
1	….. Enabled me to evaluate the product.
2	….. Assisted me to understand the performance of the product.
3	….. Allowed me to accomplish more analysis than would otherwise be difficult.
4	….. Increase the quality of my judgments.
5	….. Enhanced my effectiveness in assessing the product.

Source: items 1 and 2 from Expert Panel, and items 3, 4, and 5 from Benlian et al. (2012)

Perceived usefulness was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.5). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.905, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the perceived usefulness measure is displayed in Table 4.18. Consistent with the past study by Benlian et al. (2012), this study will consider perceived usefulness as a first order reflective construct.

Table 4.18: Decision Rules to Identify Perceived Usefulness Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Perceived usefulness measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurements are interchangeable, all the items have the same content that reflect the customer's perception of usefulness. Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The perceived usefulness items covary with each other, they have the same content (enabled me, assisted me, allowed me).		√
Rule4: Nomological net of the construct indicators	All the items or indicators would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Perceived Usefulness is a first order reflective construct**		√

4.2.1.5. Perceived Confirmation

Perceived confirmation is defined as customers' perception of congruence between expectation of OPR's use and its actual performance (Bhattacherjee, 2001b). The perceived confirmation measures adopted from the study by Bhattacherjee (2001b), who operationalized the construct by examining individuals' expectation-confirmation concerning their experience with information technology. Table 4.19 provides three items employed in this study in order to measure perceived confirmation.

Table 4.19: Items Used to Measure Perceived Confirmation

#	Items
1	My experience with the OPR was better than what I expected.
2	The service level provided by the OPR was better than what I expected.
3	Overall, most of my expectations about the OPR were confirmed.

Source: Bhattacherjee (2001b)

Perceived confirmation was reviewed and validated by a expert panel (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.908, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the perceived confirmation measure is displayed in Table 4.20. Consistent with the past studies by Bhattacherjee (2001b) and Lee (2010), this study will consider perceived confirmation as a first order reflective construct.

Table 4.20: Decision Rules to Identify Perceived Confirmation Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Perceived confirmation measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurements are interchangeable, all the items have the same content that reflect the customer's perception of confirmation. Moreover, dropping one item will not affect the construct		√
Rule3: Covariation among the indicators	The perceived confirmation items or indicators covary, thus increase in the one measure will lead the other measures.		√
Rule4: Nomological net of the construct indicators	All the items or indicators would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Perceived Confirmation is a first order reflective construct**		√

4.2.1.6.Trusting Belief

Trusting belief refers to one's perception about competence, benevolence, and integrity of the technology (Komiak & Benbasat, 2006). In the context of OPR, according to McKnight et al. (2002a) and Wang and Benbasat (2007), competence belief refers to consumer's perception that OPR has skills and expertise to provide effective recommendations, benevolence belief refers to the consumer's belief that OPR acts in his or her best interest, and integrity belief is the perception that OPR adheres to a set of principles (e.g. honesty) that are accepted by consumers. The trusting belief is consistent with the concept of cognitive trust that refers to "*a trustor's rational expectations that a trustee will have the necessary attributes to be relied upon*" (Komiak & Benbasat, 2004). Majority of the IS researches (e.g. Gefen et al., 2003; Komiak & Benbasat, 2006; Komiak & Benbasat, 2004; McKnight et al., 2002a; Wang, 2005; Wang & Benbasat, 2007, 2008) define trust as trusting beliefs. In this study, trusting belief is measured in terms of competence, benevolence, and integrity. Trusting belief and its dimensions adopted from the study by Benlian et al. (2012), who use the trusting belief as first order reflective

construct to examine the differential impact of system recommendations and consumers review on consumers' trusting belief. In contrast to Benlian et al. (2012), Benbasat and Wang (2005) used trusting belief as second-order formative construct comprising three dimensions such as competence, benevolence, and integrity, and confirmed the nomological validity of trusting belief in the context of online recommendation system. Subsequently, this study will consider trusting belief as second-order formative construct. Details of each dimensions of the trusting belief are presented in Table 4.21.

Table 4.21: Measurements of the Trusting Belief

Construct	Definition	Measure	Source
Competence Trust	It refers to the consumer's perception that the OPR has skills and expertise to provide effective recommendation.	• Competent in recommending the required product. • Expert to recommend the product according to my preference. • Effective in recommending the required product.	Benlian et al. (2012)
Benevolence Trust	It refers to the consumer's belief that the OPR acts in his or her interest	• OPR's dealings with me were in my best interest. • OPR's dealings with me felt like it would do its best to help me. • OPR's dealings with me to find a best product.	Benlian et al. (2012)
Integrity Trust	It refers to the perception that the OPR adheres to a set of principles (e.g. honesty) that are accepted by consumers.	• OPR was truthful. • OPR was unbiased. • OPR was honest. • OPR was sincere and genuine.	Benlian et al. (2012)

Since measures of trusting belief dimensions are adopted from the study by Benlian et al. (2012), who employed trusting belief as first-order reflective order, this study further examines the trusting belief to identify whether it is formative or reflective construct. Based on the decision rules in Table 4.3 and construct measures analysis shown in Table 4.22, the current study employed trusting belief as a second-order formative construct consisting three dimensions: competence, benevolence, and integrity.

Table 4.22: Decision Rules to Identify Trusting Belief Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Trusting belief construct measures are defining the characteristics of the construct. Thus, changing in the dimensions will cause change in the construct, and the change in the construct will not affect the dimensions.	√	
Rule2: Interchangeability of the indicators	Three dimensions are not interchangeable, the dimensions are the distinct from each other. They are not representing the same content, e.g. competence is totally different from benevolence and integrity. Dropping any of the dimensions alter the conceptual domain of the construct.	√	
Rule3: Covariation among the indicators	The three dimensions are not covary with each other. For example, decrease in competence will not lead to any increase in benevolence and integrity.	√	
Rule4: Nomological net of the construct indicators	Each dimension would have the different antecedents and consequences as all of them reflect the different content.	√	
Final Decision	**Trusting Belief is a second order formative construct**	√	

A. Competence Trust

Competence trust refers to the consumer's perception that OPR has skills and expertise to provide effective recommendations (Benlian et al., 2012; Wang & Benbasat, 2007). Competence measures were adopted from the study by Benlian et al. (2012), who operationalized the measures by assessing the OPR's competence using three items such as "OPRs was competent, expert, and effective in recommending required product". Table 4.23 provides three items employed in the measurement of competence trust.

Table 4.23: Items Used to Measure Competence Trust

#	Items
1	The OPR was competent in recommending the required product.
2	The OPR was expert to recommend the product according to my preference.
3	The OPR was effective in recommending the required product.

Source: Benlian et al. (2012)

Competence trust dimension was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.915, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the competence trust measure is displayed in Table 4.24. Consistent with the past studies by Benbasat and Wang (2005) and Komiak and Benbasat (2006), the current study will consider competence trust as a first order reflective construct.

Table 4.24: Decision Rules to Identify Competence Trust Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Competence trust measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurements are interchangeable, all the items have the same content that reflect the consumers' perception of OPR competence. Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	Competence trust items covary with each other, they have the same content (competent, expert, effective).		√
Rule4: Nomological net of the construct indicators	All the items would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Competence Trust is a first order reflective construct**		√

B. Benevolence Trust

Benevolence trust refers to the consumer's belief that the OPR acts in his or her interest (Benlian et al., 2012; Wang & Benbasat, 2007). Benevolence trust measures were adopted from the study by Benlian et al. (2012), who operationalized the measures by assessing the OPR's benevolence using three items such as "OPRs was in my best interest, best to help me, and to find a best product". Table 4.25 provides three times employed in the measurement of benevolence trust.

Table 4.25: Items Used to Measure Benevolence Trust

#	Items
1	I believe that the OPR's dealings with me were in my best interest.
2	I believe that the OPR's dealings with me felt like it would do its best to help me.
3	I believe that the OPR's dealings with me to find a best product.

Source: Benlian et al. (2012)

Benevolence trust dimension was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.839, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the benevolence trust measure is displayed in Table 4.26. Consistent with the past studies by Benbasat and Wang (2005) and Komiak and Benbasat (2006), this study will consider benevolence trust as a first order reflective construct.

Table 4.26: Decision Rules to Identify Benevolence Trust Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Benevolence trust measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurement are interchangeable, all the items have the same content (in my best interest, best to help me). Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The benevolence trust items covary with each other, they have the same content (best to help me, in my best interest).		√
Rule4: Nomological net of the construct indicators	All the items would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Benevolence Trust is a first order reflective construct**		√

C. Integrity Trust

Integrity trust refers to the perception that the OPR adheres to a set of principles (e.g. honesty) that are accepted by consumers (Benlian et al., 2012; Wang & Benbasat, 2007). Integrity trust measures were adopted from the study by Benlian et al. (2012), who operationalized the measures by assessing the OPR's integrity using three items such as "OPR was truthful, unbiased, honest, sincere and genuine". Table 4.27 provides four items employed in the measurement of integrity trust.

Table 4.27: Items Used to Measure Integrity Trust

#	Items
1	I believe the OPR was truthful.
2	I believe the OPR was unbiased.
3	I believe the OPR was honest.
4	I believe the OPR was sincere and genuine.

Source: Benlian et al. (2012)

Integrity trust dimension was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.885, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the construct measure is displayed in Table 4.28. Consistent with the past studies by Benbasat and Wang (2005) and Komiak and Benbasat (2006), this study will consider integrity trust as a first order reflective construct.

Table 4.28: Decision Rules to Identify Integrity Trust Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Integrity trust dimension measures are considered manifestations of the construct, thus changes in the items will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All measurements are interchangeable, all the items have the same content that reflect the customer's perception of integrity trust in OPR. Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The integrity trust items covary with each other, they have the same content (truthful, unbiased, and honest).		√
Rule4: Nomological net of the construct indicators	All the items would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Integrity Trust is a first order reflective construct**		√

4.2.1.7. Perceived Enjoyment

Perceived enjoyment refers the extent to which OPR usage is perceived to be enjoyable in its own right, apart from any performance consequences which may be expected

(Thong et al., 2006; Xu et al., 2014). The perceived enjoyment measures are adopted from the study by Thong et al. (2006), who operationalized the construct by examining the individuals' enjoyable, pleasurable, pleasant, and fun related experience with mobile internet services usage. This study employed five measures in order to measure customers' enjoyment with OPR usage. Table 4.29 presents the items included in this study for measuring perceived enjoyment.

Table 4.29: Items Used to Measure Perceived Enjoyment

#	Items
	Using the OPR for online buying was
1	….. Enjoyable.
2	….. Pleasurable.
3	….. Pleasant.
4	….. Entertaining.
5	….. Fun.

Source: items 1, 2, and 5 from Thong et al. (2006), and items 3 and 4 from expert panel

Perceived enjoyment was reviewed and validated by a panel of expert (see section 4.2.2). The construct was also subjected to an internal reliability analysis based on pilot test (see section 4.2.4). The reliability of this construct is represented by Cronbach's Alpha that was reported 0.955, which indicated good internal reliability (Chin, 2010; Hair Jr et al., 2013).

Based on the decision rules in Table 4.3, the analysis of the perceived enjoyment measure is displayed in Table 4.30. Consistent with the past studies (Thong et al., 2006; Xu et al., 2014), this study will consider perceived enjoyment as a first order reflective construct.

Table 4.30: Decision Rules to Identify Perceived Enjoyment Construct as Formative or Reflective

Criteria	Construct Analysis	Decision	
		Formative	Reflective
Rule1: Direction of causality from construct to measure implied by the conceptual definition.	Perceived enjoyment measures are considered manifestations of the construct, thus changes in the item will not cause change in the construct.		√
Rule2: Interchangeability of the indicators	All items are interchangeable, all the items have the same content (enjoyable, pleasurable, entertaining, and pleasant). Moreover, dropping one item will not affect the construct.		√
Rule3: Covariation among the indicators	The perceived enjoyment items covary, thus increase in the pleasurable interaction will leads enjoyment with OPR use.		√
Rule4: Nomological net of the construct indicators	All the items would have the same antecedents and consequence as all of them reflect the similar content.		√
Final Decision	**Perceived enjoyment is a first order reflective construct**		√

After analysing the type of the study constructs and their related measurements, Table 4.31 summarises the study constructs and their types.

Table 4.31: Summary of Study Construct Type

#	Construct	Construct Type
1	OPR Continuous usage Intention	First-Order Reflective
2	***Perceived OPR Performance***	***Second-Order Formative***
	Satisfaction	First-Order Reflective
	Perceived Decision Effort	First-Order Reflective
	Perceived Decision Quality	First-Order Reflective
3	Perceived Ease of Use	First-Order Reflective
4	Perceived Usefulness	First-Order Reflective
5	Perceived Confirmation	First-Order Reflective
6	***Trusting Belief in OPR***	***Second-Order Formative***
	Competence Trust	First-Order Reflective
	Benevolence Trust	First-Order Reflective
	Integrity Trust	First-Order Reflective
7	Perceived Enjoyment	First-Order Reflective

4.2.2. Expert Panel

To avoid any mistake or error while selecting the constructs and their related measurements for designing the survey instrument, it is essential to get feedback or opinions from experts (Babbie, 2007). By having constructs and their measurements reviewed by some experts, the survey instrument might be improved or the probable errors and mistakes could be reduced (Babbie, 2007). Since this study is employing survey instrument for data collection, it has some validity and reliability limitations. In order to improve the validity and reliability of the survey instrument, the study constructs and related measurements were passed through several reviews via expert panel, pre-testing, and pilot testing. In order to improve the content validity, the construct items which were adopted from previous studies in different contexts, were further validated within the context of the current study by having them reviewed and evaluated by an expert panel. There were two objectives of conducting expert panel: to know the relative importance of theoretical constructs and to validate their measurements.

Based on the content analysis of the past literature, eight frequently used factors related to four theoretical models; IS continuance model, effort-accuracy model, trust formation theory, and flow theory, were selected in order to examine customers' OPR continuous usage intention. The eight factors (satisfaction, decision quality, decision effort, ease of use, usefulness, confirmation, trust, and enjoyment) and their related measurements were validated in the context of this study through an expert panel. Several past studies (e.g. Ayeh, 2015; Artino, La Rochelle, Dezee, & Gehlbach, 2014; Ison, 2011; Zamanzadeh, Ghahramanian, Rassouli, Abbaszadeh, Alavi-Majd, & Nikanfar, 2015) have used expert panels to assist in the development and validation of survey instruments. There is no consensus in the literature regarding the number of experts that should be used for content

validation (Artino et al., 2014). Zamanzadeh et al. (2015) recommended to include at least five experts in the panel for generating a clearer consensus about the construct being assessed, as well as the quality and relevance of the proposed scale items. Before selecting a panel of experts, specific criteria should be developed to determine who qualifies as an expert. Prior studies have specified a number of criteria for choosing a panel of expert. For example, Ison (2011) reported that the panel should be consisted of experts who have a practicing interest in the issue of concern, and that members should be drawn from a broad range of backgrounds. Similarly, Finley, Iannuzzi, Wilson, Kinnell, Craven, and Lemeshow (2003, p. 846) suggested that experts should be selected for their expertise in the subject area of the survey, in the creation of surveys, and in demographic measurement. Additionally, Umbach (2005, p.95) recommended that expert panel should also comprise of individuals from "target population". Using subjects of the target population as expert ensures that the population for whom the instrument is being developed is represented (Rubio, Berg-Weger, Lee, and Rauch, 2003). Since the target population of this study is online customers who eventually respond to the survey questionnaire, their comments on the evaluation of construct measurements can help to improve the validity of the survey instrument. Considering the nature of this study, members of the expert panel were chosen from a pool of academicians, e-retailers, and online customers. In align with the recommendations of the above mentioned past studies, following criteria were used for choosing academicians, e-retailers, and online customers as panel of experts:

- The academic panel's members should have knowledge and necessary skill for adequate evaluation of the survey instrument, survey design issues, and the cognitive response behaviours. Academicians should have (a) PhD degree, (b) experience in conducting survey based research, (c) expertise in the subject matter

of survey design, use, and assessment, (d) linguistic ability in observing grammar, using appropriate and correct words, applying correct and proper order of words in items, and (e) adequate knowledge on the measurement of demographic attributes.

- The e-retailer panel's members should be those who provide recommendations to their customers and believe that the OPR really matters in promoting products or increasing their sale. Additionally, they should have knowledge on how OPR is actually generated and provided to the customers.
- The online customer panel's members should be those who have used OPR for making purchase decision. Additionally, the online customers who also have experience in responding to the survey questionnaire are considered ideal to be panel's members.

Following the above criteria, the expert panel was initially consisted of five academicians, three e-retailers, and four online customers. Whereas, all academicians were from University of Malaya, e-retailers were Lazada, Groupon, and Swebutick, and online customers were PhD students and had experience using OPR for making purchase decision. After determining an expert panel, panel members were contacted via email to ask if they could provide their viewpoints on the relevancy, representativeness, clarity, and comprehensiveness of the items to measure the construct operationally defined by these items to ensure the content validity of the instrument. A survey package that included a copy of the survey, cover letter, and instructions for evaluating the study constructs and their measurements in the light of construct definition was also attached in the email.

Twelve potential experts were contacted with the belief that not all would be willing or able to take part in this research study. Over the six weeks, only five members positively responded with their feedbacks on the survey instrument. They were two academicians, one e-retailer, and two online customers and the outputs of their feedback are shown in Table 4.32 and in Appendix C1. Table 4.32 presents their feedback on the relative importance of theoretical constructs.

With regards to the first objective, they were asked to rank the constructs with respect to their relative importance in influencing consumer's OPR continuous usage intention. They ranked the constructs based on their personal judgement, depicted in the Table 4.32. Nevertheless, trusting belief, satisfaction, and perceived decision quality seemed to be the most important factors pertaining to OPR continuous usage intention. Whereas, perceived ease of use, perceived enjoyment, and perceived confirmation seemed to be the comparatively less important factors pertaining to OPR continuous usage intention.

Table 4.32: Ranking of Constructs

Rank	Academicians		Online Retailer	Online Customers	
	Expert 1	**Expert 2**	**Expert 3**	**Expert 4**	**Expert 5**
1	Satisfaction	Trusting belief	Satisfaction	Perceived Decision Quality	Trusting Belief
2	Perceived Usefulness	Perceived Decision Quality	Perceived Decision Quality	Trusting Belief	Satisfaction
3	Trusting Belief	Satisfaction	Trusting Belief	Perceived Confirmation	Perceived Decision Quality
4	Perceived Decision Quality	Perceived Usefulness	Perceived Decision Effort	Satisfaction	Perceived Decision Effort
5	Perceived Enjoyment	Perceived Decision Effort	Perceived Usefulness	Perceived Usefulness	Perceived Usefulness
6	Perceived Decision Effort	Perceived Ease of Use	Perceived Ease of Use	Perceived Decision Effort	Perceived Confirmation
7	Perceived Confirmation	Perceived Decision Effort	Perceived Confirmation	Perceived Enjoyment	Perceived Ease of Use
8	Perceived Ease of Use	Perceived Confirmation	Perceived Enjoyment	Perceived Ease of Use	Perceived Enjoyment

Regarding the second objective, they were asked to provide their evaluation, feedback, and comments on the measurement items based on the respective construct definition provided in the form. Eventually, they were asked:

- Whether each item of a particular construct measures what it is intended to measure.
- Whether items are clearly stated and understandable.
- Whether there is repetition among items
- Whether there should be another item for measuring a particular construct.

Their opinions were considered to improve the construct validity and content validity of the survey instrument. The researcher analysed the opinions of expert panel with respect to each construct measurements and reported them in Appendix C1. The opinions of five experts were considered together in order to evaluate the measurements of a particular construct. The expert panel results revealed that a number of items of various constructs need to be revised and corrected. In addition to that, a number of new items of various constructs were also recommended to be included in the construct measurements. Based on the review of expert panel, a number of changes were made in the construct items by either replacing the old items with suggested new items or correcting the wording of the items in order to make it as simple as possible. Selection of the construct measurements was finalised after making the following changes in the construct items:

- Concerning the measurements of perceived enjoyment, two items: 'unexciting/exciting' and 'dull/neat' were replaced with 'unentertaining/entertaining' and 'unpleasant/pleasant', respectively. Thus, total five items were employed for measuring perceived enjoyment; three items

adopted from the study by Thong et al. (2006), and two items based on experts' suggestions.

- Second, changes were made in the measurements of perceived usefulness by including two new items: OPR enabled me to evaluate the product and OPR assisted me to understand the performance of the product. Consequently, five items were used to measure perceived usefulness: three items were adopted from the study by Benlian et al. (2012) and two items based on the opinions of the experts.
- Regarding the perceived ease of use construct, one expert highlighted that the first item is not clear. Therefore, the item is corrected from *"to make accurate judgement"* to "*to make accurate judgement of the product*". Remaining all items had no issues and consequently no changes were made in the construct measurements.
- Concerning the measurements of perceived decision quality, experts recommended additional three items to be included. One academician suggested two new items to be added; "*product recommended by OPR was best choice to buy*" and "*OPR helped me to avoid poor choice*". Consequently, total five items were included in the measurements of perceived decision quality.

No further significant changes were made in the measurements of remaining constructs such as trusting belief, perceived confirmation, perceived decision effort, satisfaction, and continuous usage intention. Minor changes were made in the sentence structure of items. For example, one expert suggested to remove word "too" from the items of perceived decision effort. Consequently, it was removed and made the items as neutral as possible in order to let the scale to measure. Experts' opinions on the construct measurements and

required changes to be made in the items of various constructs are shown in Appendix-C1.

Based on the review of the expert panel, a survey instrument was designed. The survey instrument presentation and format are being discussed in section 4.3.2. The survey instrument was further examined via pre-testing and pilot testing, which are explained in following sections.

4.2.3. Pre-testing

Before distributing the survey instrument, it is essential to perform pre-testing of survey questionnaire by some experts (Babbie, 2007). Pre-testing the survey instrument assists the researcher to receive feedback on survey instrument prior to distribution (Bowden, Fox-Rushby, Nyandieka, & Wanjau, 2002). As all data collection instrument has limitations, our survey instrument may also has reliability and validity limitations. In order to enhance reliability and validity, the survey instrument has to pass through pre-testing stage. The pre-test is executed to ensure that the measures used are consistent and lies under an acceptable level of reliability and validity. Therefore, a panel consisting of nine senior academicians (different from the academicians of the expert panel) from University of Malaya participated in the content validity evaluation of the survey instrument. The main objectives for pre-testing the survey are as follow:

- To know whether questions are simple and clear, grammatically correct, and free from jargon.
- To scrutinise the clarity of the instruction, measurements, and survey instrument.
- To examine the meaningfulness of language and readability of the questions.

- To ensure technical feasibility of survey instrument such as the length, format and flow of the survey and completion time.

Survey pre-testing was completed in two steps. At first step, a cover letter which contains objectives of conducting pre-testing and information about the study constructs, were emailed to fifteen senior academicians. After two weeks, only seven academicians completed the evaluation of the survey instrument. Their evaluation, comments, and feedback were collated and summarized with respect to each section of survey instrument. At the second step of pre-testing, the summarized comments of seven academicians were further discussed with two academicians related to the field of study. In the discussion, each survey question was further evaluated in light of the summarized comments from seven academicians. Based on the discussion, some measurements of the constructs were revised and modified by rephrasing or rewording. For example, one of them recommended to reword the statement from "how many products were bought on internet" to "how many products were bought online". Additionally, it was recommended to reword from "specify which product you have purchased" to "specify the product(s) that you have purchased". Another one recommended to reword and shorten the introductory part of the second section of the survey, which was amended accordingly. Another academician recommended to remove the question; "do you have any experience in online shopping?" because its answer was captured in the subsequent question "Approximately, how long have you been buying online?" Whereas, an academician suggested to add "I wish to receive a copy of the summarized results of the survey", which was added in the end of the survey. After adjusting, simplifying, and refining the measurement items, the layout of the survey was greatly improved.

After incorporating the suggestions from total nine academicians into the survey instrument, a pilot study with the target population of current study was conducted with the purpose of examining the measurement issues by applying statistical techniques. The following section presents the results of the pilot test.

4.2.4. Pilot Test

Participants from the target population of the study were requested to fill up the survey questionnaire. A pilot study test was suggested by several scholars (Cooper & Schindler, 2003; Robson, 2002; Straub, 1989) as a tool to evaluate the appropriateness of the study and instrument design. Since pilot test precedes actual data collection, it has several advantages. Eventually, it recognises the deficiencies of survey instrument design and makes certain that different measures present acceptable degree of reliability. Moreover, it is necessary to ensure that survey questionnaire contains proper wording, that it is in the right order, and the structure is clear and understandable for the actual respondents.

To fulfil the pilot test stage, online survey was sent to 300 Amazon customers who were the target population of this study. Generally, pilot study is small in comparison with main survey and it is useful to refine the survey instrument before expanding resources on the main survey. Within one month, 60 responses were received. Out of the 60, 50 responses were usable for pilot testing. The data collected from pilot study was tested for completeness of the responses and internal consistency of the constructs.

Straub (1998) suggested to test the reliability of data collected from pilot study prior to administering the survey for final data collection. The SPSS software (version 20) was used to test the reliability of the constructs. Cronbach's Alpha was used, that indicate the

extent to which the proposed items can measure or represent a particular construct. The result showed that all constructs were reliable, as their Cronbach's Alpha values were greater than 0.70 (Cavana, Delahaye, & Sekaran, 2001). The statistical results met the minimum threshold to establish reliability of the survey instrument. Pilot test reliability results are shown in Table 4.33, which indicated that the survey questionnaire was a reliable measurement tool, suggesting adequate internal consistency and reliability of the scale measurement. Consequently, neither further concern regarding the survey instrument was identified nor any significant changes were made to the construct measurements. After that, the main data collection was conducted.

Table 4.33: Reliability Analysis

#	Constructs	Cronbach's Alpha	No. of items	No. of items deleted
1	OPR Continuous usage Intention	0.986	4	0
3	Perceived Decision Effort	0.932	4	0
4	Perceived Decision Quality	0.939	5	0
2	Satisfaction	0.924	4	0
5	Perceived Ease of Use	0.748	5	0
6	Perceived Usefulness	0.905	5	0
7	Perceived Confirmation	0.908	3	0
8	Competence Trust	0.915	3	0
9	Benevolence Trust	0.839	3	0
10	Integrity Trust	0.885	4	0
11	Perceived Enjoyment	0.955	5	0

4.3. Phase II: Survey

4.3.1. Research Sample Determination

Two parameters are required to be examined in order to construct a survey sample; the population of interest and sample size. The target population refers to the whole group of individuals or organizations that the researcher is interested to investigate on, whereas the

subset of the population is referred to as a sample (Saunders et al., 2011). To collect data from whole population is not only difficult, but also time consuming and more expensive (Saunders et al., 2011). The more suitable way is to collect data from a sample of an adequate number of people from the target population. The data collected from an appropriate group of people from a population will allow results generalization of the population to be made (Forza, 2002). The following subsections present the characteristics of the target population, unit of analysis, sampling frame, sampling method, and sample size employed in this study.

4.3.1.1. **Target Population**

The target population chosen for this study was the Amazon customers, who have used OPR for their online buying decision making. Amazon.com Incorporation, often simply referred to as Amazon, is an American e-commerce and cloud computing company with headquarters in Seattle, Washington. It is the largest Internet-based retailer in the United States (Barney, 2011) and has separate fourteen (14) retail websites for United States, United Kingdom and Ireland, France, Canada, Germany, Italy, Spain, Netherlands, Australia, Brazil, Japan, China, India and Mexico. Since the number of product alternatives with varying qualities and prices are increasing tremendously, it increases the customer's decision making effort for selecting a particular product that best match his or her needs. In order to assist online customers, Amazon employ various IT mechanisms in its e-commerce website for generating product recommendations. As such, Amazon website is embedded with product recommender system that recommends a list of products (i.e. OPRs) to a particular customer, based on various content or collaborative filtering techniques (Benlian et al., 2012; Lin, 2014). The OPRs also contain consumer reviews along with recommended products, perhaps with the purpose of

providing more related information in order to improve customers' buying decision or enhance the effectiveness of product recommendations (Benlian et al., 2012; Kumar & Benbasat, 2006; Lin, 2014).

Furthermore, Amazon customers were considered as target population due to following four reasons. First, Amazon is recognized as one of the leading e-commerce retailers and is a positive example for other online shopping stores in terms of the way it supports the provision of OPR (Archak et al., 2011; Benlian et al., 2012). Second, the Amazon customers are likely to present strong online buying power. Third, they have exposure of OPR while buying online. Fourth, a verified list of Amazon customers[1] is available on the amazon website. The following sections specify the unit of analysis in this study

4.3.1.2. **Unit of Analysis**

The participants of this study were the direct users of OPR provided by Amazon. Sekaran and Bougie (2010) reported that determining the unit of analysis is important and it is determined by the objective of the study. Cotterman and Kumar (1989) argued that direct users are the consumers of information. Therefore, the unit of analysis of this study is real customers of Amazon, who have used OPR for their online buying.

Furthermore, literature content analysis revealed that majority of past studies have neglected the "real-world phenomena" (i.e. customer environment) in favor of controlled and overly structured laboratory experiments, and were thus unable to explore how decision makers actually obtain information and use it in decisions making process (Zha

[1] http://www.amazon.com/review/top-reviewers/ref=cm_cr_tr_link_next_2?ie=UTF8&page=2

et al., 2013). Therefore, in contrast to the experimental studies, this study focuses on real consumers who relied on OPR for their online buying decision making by conducting online survey.

4.3.1.2. Sampling Frame and Sampling Method

A sampling frame is a representation of elements of the target population. It consists of list or a set of directions for identifying the target population (Malhotra, 2010). Amazon has fourteen retail websites dedicated to different countries. A list of 10,000 verified customers[2] is publically disclosed on each website of Amazon. Hence, all together 140,000 online customers list is available, and anyone can visit their profiles to gather further information such as their names, location, e-mail address and etc. In order to gather their email addresses, the researcher visited the list of customers with the purpose of collecting as many email addresses as possible. Majority of customers have not disclosed their email addresses in their profiles. After visiting many profiles, 3500 email addresses were collected. The customers have not mentioned whether they have used OPR for their online buying decision making. Therefore, one screening question was added in the survey questionnaire in order to let those customers who have used OPR for their buying decision to proceed the remaining parts of the questionnaire. The customers who have not used OPR for their buying decision were automatically not allowed to participate in the survey. An online survey designed on surveymonkey website was sent to all email addresses collected. Surveymonkey is a professional online platform for collecting data by designing and sending online survey. The following sub-section presents the sample size of this study.

[2] http://www.amazon.com/review/top-reviewers/ref=cm_cr_tr_link_next_2?ie=UTF8&page=2

4.3.1.2. Sample Size

Determining sufficient sample size is important for a piece of research, which depends on certain aspects, such as the suggested data analysis methods (Malhotra, 2010). Since this study utilizes the PLS-SEM based on various reasons discussed in section 4.3.4., PLS-SEM has rules for accepting minimum sample size. However, PLS-SEM accepts the use of 10 times rule by Barclay et al. (1995), who suggested sample size to be 10 times either the factor that contains the biggest number of formative indicators or 10 times the biggest number of structural paths linked to a specific construct in the structural model (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Since this rule indicates the minimum sample size required, the researcher should assign the sample size according to model foundations and data characteristics (Hair et al., 2011). Considering the 10 times rule, the study model has 3 formative indicators that form OPR performance, ($3 \times 10 = 30$ cases), therefore, 30 is the minimum required sample size.

Hair, Black, Babin, and Anderson (2010) argued that bigger sample sizes usually generate higher power for the statistical analysis with respect to the level of alpha. In addition to that, Pallant (2010) pointed out that the power of any test is influenced by three factors such as sample size, effect size, and alpha level (e.g. 1% or 5%). Stevens (2012) stated that when sample size is sufficient, then power will not be considered as an issue. Furthermore, Pallant (2010) argued that sample size should be greater than 150 cases with a ratio of five cases for each indicator. Since the proposed research model for this study consists of 45 indicators (4 indicators measure OPR continuous usage intention, 13 indicators measure OPR performance, 5 indicators measure perceived ease of use, 5 indicators measure perceived usefulness, 3 indicators measure perceived confirmation, 10 indicators measure trusting belief, and 5 indicators measure perceived enjoyment),

following the 5:1 ratio (5 × 45 = 225), 225 is the minimum acceptable sample size for this study. In the current study, 626 usable cases were collected from target respondents which is considered sufficient by the power calculation.

4.3.2. Questionnaire Design

A questionnaire is a formalized set of questions for obtaining information from the respondents. There are normally two type of question formats used for designing a survey questionnaire, one is open-ended questions and other is fixed choice questions (Patton, 2005). This study employed mostly a fixed choice questions format which provides respondents a list of possible options from which to select. Both categorical and Likert-scale questions were used in the questionnaire. The Likert scales refers to the extent to which the respondents agree or disagree with a specific statement (Gratton & Jones, 2010).

The survey questionnaire was designed by operationalizing the constructs. The construct validity and content validity were ensured by consulting expert panel and pre-testing the questionnaire (see section 4.2.2 and 4.2.3). Furthermore, the survey questionnaire was also validated by examining Cronbach's Alpha based on the data collected through pilot study. Some items of the constructs were used in the similar manner of past studies and mostly are modified according to the context, nature, and purpose of the study. All questionnaire items of the constructs were measured on five Likert scale.

Five point Likert scale which anchored from "1 for strongly disagree" to "5 for strongly agree" were used in order to measure perceived decision effort, perceived decision quality, perceived ease of use, perceived usefulness, perceived confirmation, trusting

belief, and perceived enjoyment. Whereas semantic differential scale was used to measure satisfaction and five point Liker scale ranging from "1 for very unlikely" to "5 for very likely" was used to measure OPR continuous usage intention.

In order to ensure that only Amazon customers who have used OPR for their online buying decision fill out the survey, one screening question was included in the second section of the survey. In accordance to that, the respondents were asked if they have either used OPR for their online buying decision over the last six month. Those respondents who have not used OPR for their online buying decision, were not able to proceed the survey due to inherent restriction in the online survey. The survey questionnaire was consisted the following four sections:

Section 1 measured the respondents' personal experience with Internet usage and online shopping.

Section 2 started with screening question and also measured the respondents' experience of online shopping (the type and number of product bought over last 6 months) using OPR. Questions related to respondents' expertise, and familiarity with OPR, and future online buying intention were also included in this section.

Section 3 contained questions related to respondents' evaluation beliefs such as perceived ease of use, perceived usefulness, perceived confirmation, trusting belief and perceived enjoyment; OPR performance dimensions comprising perceived decision effort, perceived decision quality, and customer satisfaction; and OPR continuous usage intention. In this section, questions related to all independent and dependent constructs were kept separate.

Section 4 contained the demographic information of respondents such as gender, age, education, marital status, occupation, monthly income, and geographical location (country name).

After designing the online survey on surveymonkey, it was tested by the researcher to know check if the online survey link is working properly. After confirming the proper function of the online survey, the survey invitations were sent through surveymonkey website, containing cover letter with a brief introduction and the purpose of the survey, as well as assurance statements concerning confidentiality and anonymity of the information provided by them. The survey questionnaire is shown in Appendix A. The next section provides the reasons and justification for conducting online survey.

4.3.3. Online Survey

Survey is the most widely used data collection approach in IS research (Palvia, Mao, Salam, & Soliman, 2003). Survey is a generic term that refers to different data collection procedures. According to Gable (1994) and Pinsonneault and Kraemer (1993), survey facilitates in producing quantitative description of the target population by using structured and pre-defined questions. It collects data from a fraction of the target population in such a way that facilitates generalization of the results to the whole population. Furthermore, survey helps the researcher to study the phenomena of interest that is occurring in their natural settings or has occurred in the recent past years. Survey method has been extensively applied in prior IS literatures (Davis, 1989; Thong et al., 2006; Venkatesh et al., 2003). Survey-based research is usually used to advance scientific knowledge and to test or validate a theory (Pinsonneault & Kraemer, 1993).

In this study, online survey was employed to collect data from real users (i.e. verified amazon customers) of OPR, because most past studies have neglected the "real-world" customer environment in favour of controlled and overly structured laboratory experiments, and were thus unable to explore how decision makers actually obtain information and use it in their decisions making (Zha et al., 2013). The major reasons to use online survey were geographically dispersed population and non-availability of their postal addresses. Wright (2005) argued that an online survey is more suitable and an effective way to reach the target respondents, especially when they are geographically dispersed. Since the target population was Amazon customers, it was assumed that they were homogeneous irrespective of their geographical locations, and they frequently use Internet services and read their emails. In addition, it was easy to collect email addresses from their Amazon profiles as they themselves disclosed their email addresses. Furthermore, online survey method provides several benefits over paper-based survey (Fricker & Schonlau, 2002; Wright, 2005). For example, online survey approach is regarded as rapid, fast, and cheaper. It is easy to answer. Most of the time, it only requires simple mouse clicks and responses are directly stored in a database. Thus, it does not require manual entry which would not lead to error-free data. Therefore, all these reasons led the researcher to employ online survey as a data collection method.

For this decision, an online survey was designed on surveymonkey platform and distributed to Amazon customers through e-mails. Surveymonkey platform was chosen due to two reasons. First, it is a professional site for conducting online survey. Second, it assists the researcher through a real-time tracking of responses along with descriptive statistics and associated charts. In this study, 3500 respondents (Amazon customers) were requested to participate in the survey and survey administration spanned a period of 17 weeks. Appropriate follow-up reminders and promises of anonymity were some of the

strategies used to improve response rate (Dillman, 2011). The survey invitation included clear instructions and a notification indicating that the participation is voluntary (Dillman, 2011). Furthermore, respondents were informed that they would receive the research findings of this study upon request (Dillman, 2011). After three follow-up reminders, a total of 751 responses were received. Out of them, 626 responses were usable for data analysis and rest of the responses had significant missing values which were discarded for further analysis. The next section presents the data analysis techniques used in this study.

4.3.4. Data Analysis Technique

To analyse the survey data, suitable techniques and software were chosen. In this study, the following two software were chosen for data analysis: SPSS (version 20) and SmartPLS (version 2 M3). SPSS was used for completing the following tasks: (1) to prepare the data for analysis (e.g. checking and treating missing values), (1) to calculate descriptive statistics for demographic analysis, (3) to evaluate multivariate assumption (e.g. normality), (4) to conduct exploratory factor analysis, and (5) common method bias analysis (CMB). SmartPLS was used to assess the confirmatory factor analysis (CFA), reliability and validity of the measurements, and to test the hypotheses by evaluating the structural model. The current study employed structural equation modelling, which is discussed in the following section.

4.3.4.1. **Structural Equation Modelling**

The structure equation modeling (SEM) is an advance statistical analysis method used to analyse the complex relationships between variables (Hair Jr et al., 2013). The SEM has

become one of the most important methods of empirical researches in order to test structural model. It has been applied in various disciplines including marketing research (Werner Reinartz, Haenlein, and Henseler, 2009), management research (Williams, Edwards, and Vandenberg, 2003), information system research (Choi & Scott, 2013; Thong et al., 2006), and consumer psychology research (Hsu, Chuan-Chuan Lin, & Chiang, 2013). The SEM is considered as a second generation multivariate method for data analysis (Hair Jr et al., 2013). It is a mixed methodology which consists of confirmatory factor analysis (CFA), regression, and path analysis. However, the SEM simultaneously analyses the relationships between multiple independent and dependent variables (Gefen et al., 2000). It is commonly used to test, explore or develop a theory (Hair Jr et al., 2013).

There are two major methods for SEM analysis: Co-variance based Structural Equation Modelling (CB-SEM) and the Partial Least Square based Structural Equation Modelling (PLS-SEM). Each method has very different underlying estimate objectives, philosophies, and distributional assumptions (Gefen, Straub, & Rigdon, 2011; Hair Jr et al., 2013). CB-SEM is integrated in statistical packages such as LISREL, EQS, MPlus, and AMOS, whereas PLS-SEM is commonly used with PLS and is embodied in statistical packages such as XL-Stat, VisualPLS, WarpPLS, Smart PLS and PLS-Graph. In order to decide which method (PLS-SEM or CB-SEM) should be employed in a particular research, Hair et al. (2011) outlined five rules of thumb concerning the decision considerations. These five rules of thumb for selecting PLS-SEM or CB-SEM are presented in Table 4.34.

Table 4.34: Rules of Thumb for Selecting PLS-SEM or CB-SEM

Criteria	PLS-SEM	CB-SEM
Research Goals	• Predicting key target constructs or identifying key 'driver' constructs • The research is exploratory or an extension of an existing structural theory	• Theory testing, theory confirmation or comparison of alternative theories.
Measurement Model Specification	• If formative constructs are part of the structural model.	• If error terms require additional specifications, such as covariation.
Structural Model	• If the structural model is complex (many constructs and many indicators).	• If the model is non-recursive.
Data Characteristics and Algorithm	• Sample size is small and/or non-normal data distribution.	• Large data set and/or normal data.
Model Evaluation	• If researcher needs to use latent variable scores in subsequent analyses.	• Requires a global goodness-of-fit criterion • Need to test for measurement model invariance.

Source:Hair et al. (2011)

After contrasting between PLS-SEM and CB-SEM based on five decision criteria, the researcher decided to utilise the PLS-SEM method due to the following six reasons. ***First***, PLS-SEM is an appropriate choice when a study is exploring or extending an existing structural theory. However, this study develops an integrated research model which extends IS continuance model by integrating effort-accuracy model, flow theory, and theory of trust formation, and examining it in the study context. ***Second,*** PLS-SEM is recommended to those studies, whose research models have formative constructs. As mentioned in section 4.2.1, this study also has two formative constructs: trusting beliefs and OPR performance. ***Third,*** PLS-SEM is more suitable for explaining complex relationships as it eliminates two key issues: in-admissible solutions and factor indeterminacy (Fornell, 1982). The research model of this study has second-order constructs considering complex relationships. However, OPR performance construct is consisting of three dimension with 13 items and trusting belief also consisting three dimensions consisting of 10 items. ***Fourth,*** PLS-SEM can deal with small and large

sample size, as well as non-normal data distribution (Chin, 2010). However, the study sample size is adequate and approximately normal. Nevertheless, PLS-SEM still can be used in this case. Hair et al. (2011) stated that PLS-SEM and CB-SEM provide similar results with large sample size. ***Fifth,*** PLS-SEM is more suitable, if researcher needs to use latent construct score. However, latent score was used to analyse the second-order constructs such as trusting belief and OPR performance. ***Sixth,*** PLS-SEM is more well-known and widely used in information system research (Tennant, 2014; Wong, 2013) indicating the suitability of using the PLS-SEM. Additionally, Marcoulides, Chin, and Saunders (2009) pointed out that the information system discipline counts strongly on PLS-SEM for examining the path models much more than other disciplines. Therefore, it is appropriate to use PLS-SEM in testing the research model of this study.

The following sections present the techniques used in this study and assessment criteria for assessing the measurement and structural models.

4.3.4.2. Assessing the PLS Path Model

Chin (1998) has specified a criteria to assess partial model structures. This criteria is systematically applied in two-step process: (1) the assessment of the outer model and (2) the assessment of the inner model. At the beginning of the two-step process, model assessment emphases on the measurement models. A systematic evaluation of PLS estimate shows the measurement reliability and validity according to certain criteria that are associated with formative and reflective outer model. It makes sense to evaluate the inner path model estimates when the calculated latent variable scores show the evidence of sufficient reliability and validity (Henseler, Ringle, & Sinkovics, 2009). Figure 4.3 shows a two-step process of PLS path model assessment.

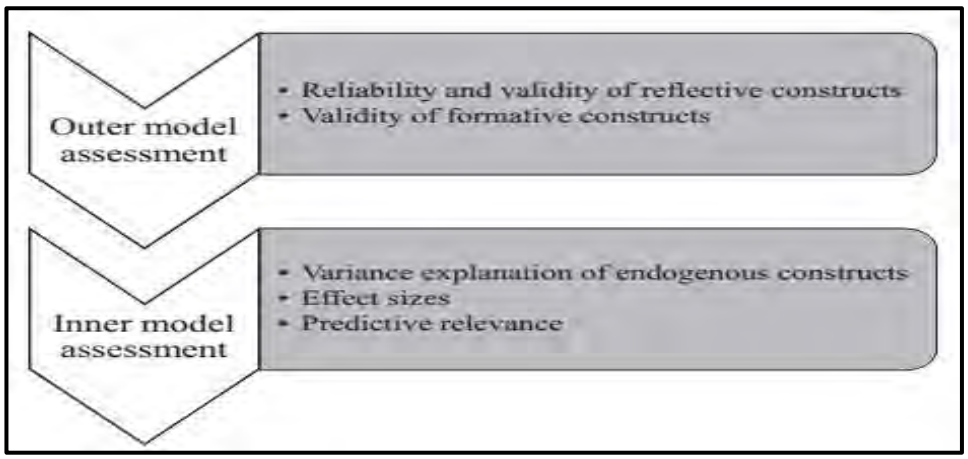


Figure 4.3: A Two-Step Process of PLS-Path Model Assessment

Source: (Henseler et al., 2009)

For reflective measurement, Henseler et al. (2009) argued that reflective measurement models should be examined with respect to their reliability and validity. Reliability refers to measurement accuracy, particularly the extent to which a survey instrument yields consistent or error-free results (Boudreau, Gefen, & Straub, 2001). Hair Jr et al. (2013) argued that a measure is reliable when it generates consistent results under consistent conditions. Generally, there are five recognised techniques used to examine reliability: (1) internal consistency, (2) split halves, (3) alternative or equivalent forms, (4) test-retest, and (5) inter-rater reliability (Boudreau et al., 2001). The most widely used technique for reliability assessment is internal consistency reliability (Hair Jr et al., 2013). Cronbach' alpha values and composite reliability are most commonly used to measures internal consistency reliability. Cronbach alpha value is based on indicators inter-correlation (Cronbach, 1951), whereas composite reliability is based on standardized factor loadings and error variance. No matter which reliability coefficient is used, an internal consistency reliability value should be 0.70 or higher (Chin, 2010; Nunnally, 1978), whereby values below 0.6 indicate lack of reliability (Henseler et al., 2009).

Construct validity refers to the extent which a construct's indicators jointly measure what it intends to measure (Hair Jr et al., 2013; Straub, 1989). Construct validity is a critical element because construct is not observable, hence it is needed to assess how well a measure reflects its unobservable theoretical construct (Ping, 2004). The measure the validity, there are two validity subtypes which are usually examined: convergent validity and discriminant validity (Henseler et al., 2009). Convergent validity refers to the extent which an indicator correlates positively with other alternative indicators of the same construct (Hair Jr et al., 2013). It reflects the extent to which indicators converge in their representation of the underlying construct they intend to measure (Chin, 2010). Fornell and Larcker (1981) suggested to use average variance extracted (AVE) to measure convergent validity. An AVE value of at least 0.50 indicates sufficient convergent validity (Fornell & Larcker, 1981), which mean that a latent variable was able to explain more than half of the variance of its indicators on average (Henseler et al., 2009).

Chin (2010) defines discriminant validity as the extent to which a construct is distinct from other constructs. It implies that a construct is unique and captures phenomena that is not represented by other constructs in the theoretical model (Hair Jr et al., 2013; Straub, 1989). There are two ways to assess the discriminant validity: the Fornell-Larcker criterion and cross loadings (Hair et al., 2011; Henseler et al., 2009). According to the Fornell-Larcker criteria, the AVE of each latent variable should be higher than the squared correlations with all other latent variables (Hair et al., 2011; Henseler et al., 2009). Another way of establishing discriminant validity is to examine the cross-loadings of the indicators (Chin, 2010). If cross-loadings exceed the construct indicators' loadings, then there is a discriminant validity problem (Chin, 2010; Henseler et al., 2009). Table 4.35 shows the criterions for the assessing the reflective measurements.

Table 4.35: Assessing Reflective Measurement Models.

Criterion	Description
Composite reliability	The composite reliability is a measure of internal consistency and must not be lower than 0.6.
Indicator reliability	Absolute standardized outer (component) loadings should be higher than 0.7.
Average variance extracted (AVE)	The average variance extracted should be higher than 0.5.
Fornell–Larcker criterion	In order to ensure discriminant validity, the AVE of each latent variable should be higher than the squared correlations with all other latent variables. Thereby, each latent variable shares more variance with its own block of indicators than with another latent variable representing a different block of indicators.
Cross-loadings	Cross-loadings offer another check for discriminant validity. If an indicator has a higher correlation with another latent variable than with its respective latent variable, the appropriateness of the model should be reconsidered.

Source: Henseler et al. (2009)

For formative measurements, Bollen Kenneth (1989) and Bagozzi (1994) emphasize that traditional validity assessments as classical test theory do not apply to manifest variables that are used in formative measurement models and that the concepts of reliability (i.e. internal consistency) and construct validity (i.e. convergent and discriminant validity) are not meaningful when a formative mode is employed. There are different ways to examine the formative measures. Henseler et al. (2009) pointed out four criterions to assess the formative measures: (1) nomological validity, (2) external validity, (3) significance of weights, and (4) multicollinearity. Table 4.36 explains these four criterions for assessing the formative measurements.

Table 4.36: Assessing Formative Measurement Model

Criterion	Description
Nomological validity	The relationships between the formative index and other constructs in the path model, which are sufficiently well known through prior research, should be strong and significant.
External validity	The formative index should explain a big part of the variance of an alternative reflective measure of the focal construct.
Significance of weights	Estimated weights of formative measurement models should be significant.
Multicollinearity	Manifested variables in a formative block should be tested for multicollinearity. The variance inflation factor (VIF) can be used for such tests. As a rule of thumb, a VIF greater than ten indicates the presence of harmful collinearity. However, any VIF substantially greater than one indicates multicollinearity.

Source: Henseler et al. (2009)

4.3.4.3. Assessing the Structural Model

Reliable and valid outer model estimations allow an evaluation of the inner path model estimates. Table 4.38 shows criteria for assessing the structural model. The structural model is evaluated by using coefficient of determination (R^2) and estimation of path coefficients. In addition to that, a more in-depth analysis of the structural model can be done by examining the values of effect size f^2 and predictive relevance Q^2 and q^2.

The non-parametric bootstrap procedure (Davison & Hinkley, 1997; Efron & Tibshirani, 1993) can be used in PLS path modelling in order to provide confidence intervals for all parameter estimates, building the basis for statistical inference. In general, the bootstrap technique provides an estimate of the shape, spread, and bias of the sampling distribution of a specific statistic. Bootstrapping treats the observed sample as if it represents the population. The procedure creates a large, pre-specified number of bootstrap samples (e.g. 5,000). Each bootstrap sample should have the same number of cases as the original sample. Bootstrap samples are created by randomly drawing cases with replacement from

the original sample (Henseler et al., 2009). Table 4.37 presents the criteria for assessing the structural model.

Table 4.37: Assessing Structural Model

Criterion	Description
R^2 of endogenous latent variables	R^2 values of 0.67, 0.33, or 0.19 for endogenous latent variables in the inner path model are described as substantial, moderate, or weak by Chin (1998, p. 323).
Estimates for path coefficients	The estimated values for path relationships in the structural model should be evaluated in terms of sign, magnitude, and significance (the latter via bootstrapping).
Effect size f^2	$f^2 = (R^2_{included} - R^2_{excluded})/(1- R^2_{included})$; values of 0.02, 0.15, and 0.35 can be viewed as a gauge for whether a predictor latent variable has a weak, medium, or large effect at the structural level.

Source: Henseler et al. (2009)

4.4. Research Ethics Consideration

Ethical considerations influence many aspects of the research process and help researchers to decide whether a field of study or a specific investigation is ethically acceptable (Behi and Nolan, 1995). This study followed the ethical considerations suggested by Bryman and Bell (2015). Since this study employed survey method for data collection, all respondents were informed of the research objectives, voluntary participation, non-obligation to answer all the questions and confidentiality of their participation, and assured of their anonymity when the outcome of the findings was published. This study avoided to use of offensive, discriminatory, or other unacceptable language while designing survey questionnaire. See Appendix A for the survey questionnaire which includes a cover sheet with information on the research objective, voluntary participation, confidentiality, and anonymity of responses. Moreover, the researcher tried his best to maintain high level of objectivity in analyses and discussions

throughout the research. Any type of communication in relation to the research was done with honesty and transparency. Furthermore, the author acknowledged the works of other researchers used in any part of the thesis by properly citing the original sources with the use of APA referencing style according to the formatting requirements of University of Malaya.

4.5. Summary

This chapter presented an overview of research design and paradigm used in this study. Then, it discussed the research methods that were used for developing and validating the research on measures. In addition to that, the chapter presented the measurement development and validation process through expert panel, pretesting, and pilot testing. After that, research sample determination consisting target population, unit of analysis, sampling frame, and sample size are presented. Subsequently, questionnaire design and online survey employed are discussed. Finally, data analysis techniques were discussed in details. A visual presentation of the research process and outcomes are depicted in Figure 4.4. The next chapter presents the data preparation and analysis for the data collected using SPSS (version 20) and SmartPLS (version 2. M3).

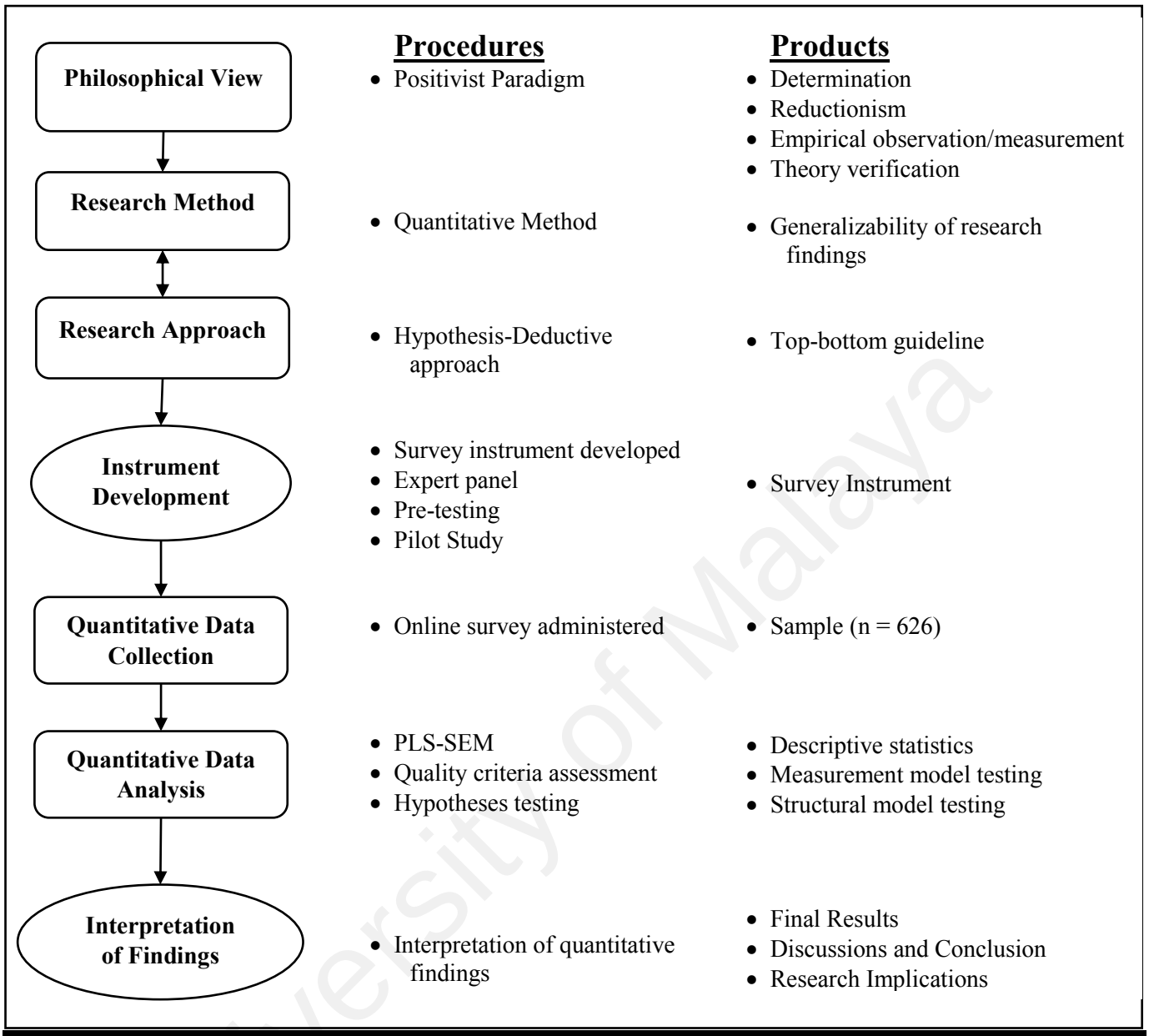


Figure 4.4: Visual Presentation of Research Process and Outcomes

CHAPTER 5

DATA ANALYSIS

5. Introduction

This chapter explains the way the collected data is used to analyse the research model. This chapter is divided into five sections; (1) data preparation process, (2) analysis of multivariate assumption, (3) assessment of measurement model, (4) analysis of proposed research model, and (5) analysis of structural model. Data preparation process includes data coding, data cleaning, missing data handling, monotone response pattern analysis, demographic analysis, assessment of non-response bias, exploratory factor analysis (EFA), and examination of outliers. Analysis of multivariate assumptions is done by conducting test of normality, test of multicollinearity, and common method bias. Further analysis is conducted using Partial Least Square Structural Equation Modeling (PLS-SEM). PLS-SEM is used to examine the reflective measure reliability and validity as well as formative measure validity in addition to confirmatory factor analysis (CFA). Then, the proposed research model is analysed using PLS-SEM by proposing and examining alternative models. In the end, the final structural model is used to test the hypotheses. Additionally, this section also presents the comparison between full model, theoretical model, and control model, and then results are ready for interpretation and discussion.

5.1. Data Preparation

Data preparation process includes data coding, data cleaning, missing data handling, monotone response pattern analysis, demographic analysis, assessment of non-response

bias, exploratory factor analysis, and examination of outliers. The following subsections provide details of the data preparation steps.

5.1.1. Data Coding and Cleaning

Data coding is the primary step in data preparation process for empirical researchers. Data coding refers to the insertion of the collected data into a statistical software package such as SPSS. As the study survey questionnaire contains 45 items or questions, which form the measurement of the proposed constructs of this study. Each item was given a code as a representation for the purpose of data analysis. A total of 751 respondents participated in the online survey. Out of them, 30 respondents did not use OPR for their buying decision, consequently they could not proceed the survey. Thus, the remaining 721 respondents who used OPR completed the survey. As the data was collected through surveymonkey which allows the excel file of the collected data to be downloaded by the researcher. Subsequently, the excel file was imported into SPSS (version 20) to examine the completeness and consistency of the data. The following section describes the missing data analysis and handling.

5.1.2. Missing Data

Missing data is often an issue in empirical studies that utilizes survey approach. Missing data occurs when a respondent intentionally or unintentionally does not answer one or more questions in the survey questionnaire. Hair et al. (2014) stated that when the missing data in one record exceeds 15%, then the record is rendered inapplicable. After screening out the data files, the researcher found that 93 responses were affected by more than 15%

of missing data, and consequently those responses were deleted from the data file. As a result, 628 responses were further examined to treat the non-significant missing values.

In this study, SPSS (version 20) was used to further screen the data by calculating frequency. The frequency revealed that a number of indicators of the study constructs had missing values up to maximum 3 cases. There are various way to treat the missing value such as mean value replacement, case wise deletion (Hair et al., 2014) and expectation maximization likelihood approach (Lauritzen, 1995). This study used expectation maximization (EM) approach by using SPSS. The EM approach has proved a flexible tool for computing maximum likelihood estimates in various type of problems involving missing data or incomplete information (Lauritzen, 1995). After treating the missing values, the researcher also screened the pattern for all responses. It is explained in the next section.

5.1.3. Monotone Response Pattern

This study also performed checks or screened the pattern for all responses. Straight lining pattern is an issue in survey based research. This occurs when a respondent answers all the questions by selecting the same option. For example, on 5 point Likert scale, the respondent has chosen 3 in his answer for all the questions. In this case, the response is considered biased and must be discarded (Hair et al., 2014). After screening all responses one by one, two (2) responses were found with this issue, and had to be discarded from the data file.

As result, from the 721 collected questionnaires, 93 were removed due to more than 15% data missing (see section 5.1.2) and 2 were further excluded due to monotone response

pattern, and making the final number of usable questionnaires were 626. These 626 responses were used for testing the measurement and structural models. The next section presents the demographic analysis of respondents.

5.1.4. Demographic Analysis

The demographic profile of the survey respondents included their gender, age, occupation, income, geographical location, experience with OPR, familiarity with Amazon and expertise in using OPR. Overall, 329 males participated in this study, that represents 52.6% of the total respondents; 289 females participated (46.2%), remaining did not report their gender. Almost all respondents (92%) were more than 26 years old and more specifically 171 (27.3%) respondents were more than 55 years old, followed by the 46-55 years of age group with 141 respondents (22.5%), and 5 (0.8%) respondents who did not report their age group. Overall, 382 respondents were married (61%), 137 were single (15.3%), 57 were divorced (9.1%), 22 were widowed (3.5%), 13 were living with partners (2.1%), and 13 didn't report their marital status (2.1%). With respect to respondents' education, majority of respondents had bachelor's degree (42.9%), followed by master's degree (25.4%), diploma (15.3%) and only 7.5% had doctorate qualification. With regards to occupation, equal number (27%) of respondents were private and self-employed, 118 (18.8%) respondents were retiree, 82 (13.1%) were government employees, and 40 (6.4%) respondents were students. Majority of respondents (30.7%) didn't want to disclose their monthly income, whereas 123 (19.6%) respondents had monthly income more than 5,000 USD, followed by 74 (11.8%) respondents whose income were in the range of 3,001 - 4000. Regarding geographical location of the respondents, they belong to 15 different countries, but majority of respondents were from

the USA (45%) and UK (14.1%), followed by Germany (7.2%), France (6.1%), Italy (5.6%), Canada (4.8%), and the remaining as shown in Table 5.4.

With respect to respondents' experience of online buying and OPR usage, 78.9% of the respondents are buying products online for more than 5 years, whereas 58.6% have been using OPR for more than 5 years. Over the last six months, 350 (55.9%) respondents purchased more than 20 products and 304 (48.6%) respondents spent more than 500 USD on online purchase. Moreover, five point Likert scale was used to measure respondents' familiarity with Amazon and OPR, and as a result, the mean value shows that respondents have higher familiarity with Amazon (mean=4.81, SD=0.593) and OPR (mean=4.62, SD=0.838), and they regularly visit Amazon (mean=4.32, SD=0.81). The demographic summary of survey respondents is presented in Table 5.1.

Table 5.1: Demographic Summary of Survey Respondents (N=626)

Variables	Frequency	Percentage (%)
Online buying experience		
Less than 1 year	6	01.0
1 - 2 years	7	01.1
2 - 3 years	32	05.1
3 - 4 years	45	07.2
4 - 5 years	42	06.7
More than 5 years	494	78.9
Purchases over six month		
1 – 5	131	20.9
6 - 10	69	06.7
11 - 15	42	02.1
15 - 20	13	03.4
16 - 20	21	11.0
More than 20	350	55.9
Money spent over six month		
Less than 100 USD	29	04.6
100 - 200 USD	68	10.9
201 - 300 USD	68	14.0
301 - 400 USD	81	12.9
401 - 500 USD	63	10.1
More than 500 USD	304	48.6
OPR usage experience		
Less than 1 year	22	03.5
1 - 2 years	43	06.9
2 - 3 years	52	08.3
3 - 4 years	78	12.5
4 - 5 years	64	10.2
More than 5 years	367	58.6
Gender		
Male	329	52.6
Female	289	46.2

Missing Values	8	01.3
Age group		
Less than 20 years	6	01.0
20 - 25 years	37	05.9
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	00.8
Marital Status		
Single	137	15.3
Married	382	61.0
Living with partner	13	02.1
Divorced	57	09.1
Widowed	22	03.5
Other	2	00.4
Missing Values	13	02.1
Education		
Certificate	37	05.9
Diploma	96	15.3
Bachelor Degree	269	42.9
Master Degree	159	25.4
Doctorate	47	07.5
Other	11	01.9
Missing Values	7	01.1
Occupation		
Government Employed	82	13.1
Private Employed	169	27.0
Self-Employed	169	27.0
Unemployed	34	05.4
Student	40	06.4
Retiree	118	18.8
Other	8	01.3
Missing Values	6	01.0
Income		
Under 1,000 USD	35	05.6
1,000 - 2,000 USD	48	07.6
2,001 - 3,000 USD	62	09.9
3,001 - 4,000 USD	74	11.8
4,001 - 5,000 USD	54	08.6
Over 5,000 USD	123	19.6
No Income	29	04.6
Don't want to disclose	192	30.7
Missing Values	9	01.4
Country		
Australia	26	04.2
Brazil	9	01.4
Canada	30	04.8
China	4	00.6
France	38	06.1
Germany	45	07.2
India	21	03.4
Ireland	1	00.2
Italy	35	05.6
Japan	8	01.3
Mexico	8	01.3
Netherlands	3	00.5
Spain	11	01.8
UK	88	14.1
USA	282	45.0
Other	3	00.5
Missing Values	14	02.2

5.1.5. Assessment of Non-Response Bias

Non-response bias is one of the major challenges for studies using survey as a data collection technique. It is an essential concern in social science discipline, and happens when actual survey respondents different from sampled respondents, which may be the respondents who refused to participate in the survey (Malhotra, 2010). Generally, researchers think that they don't need to worry about the non-response bias, when survey response rate is sufficiently high. But statistician and other experts (Atif, Richards, & Bilgin, 2012; Barriball & While, 1999) suggest to assess the non-response bias regardless of how high or low response rate is achieved. There are several ways to control the non-response bias such as comparing respondents to population, double-dipping non-respondents, ignoring non-respondents, comparing respondents to non-respondents, and comparing early to late respondents (Miller & Smith, 1983).

In this study, non-response bias analysis was done by contrasting the responses of early and late respondents. The respondents are defined as early and late respondents considering first 100 and last 100 questionnaires received (Karahanna et al., 1999). To check for the non-response biasness, a comparison means on all study constructs was carried out using paired t-test. The results of paired t-test for each construct revealed that significance value for all study constructs are above 0.05. Thus, it is concluded that there are no statistically significant differences in the means for these two groups. Those respondent who did not respond to the survey will probably have the same perceptions of the constructs as those respondents who have responded to the survey. Table 5.2 presents the results for non-response bias. The next section details the exploratory factor analysis.

Table 5.2: Analysis of Non-response Bias

Variables		N	Mean	Std. Deviation	t-Statistics	Sig. (2-tailed)
Perceived Ease of use (PEOU)	Early	100	3.5740	.94779	-1.156	.122
	Late	100	3.7860	1.02346		
Perceived Usefulness (PU)	Early	100	3.6917	1.16912	-.540	.590
	Late	100	3.5992	1.23261		
Perceived Confirmation (PC)	Early	100	3.3370	0.92126	.023	.982
	Late	100	3.3400	0.91008		
Perceived Enjoyment (ENJ)	Early	100	3.4734	0.91199	.972	.333
	Late	100	3.5920	0.80399		
Trusting Belief (TRUST)	Early	100	3.6771	0.82898	.424	.672
	Late	100	3.7281	0.81172		
Trust Competence (TC)	Early	100	4.0133	0.83943	1.172	.244
	Late	100	3.8610	0.83408		
Trust Benevolence (TB)	Early	100	3.3267	1.00502	-1.146	.255
	Late	100	3.4933	0.97957		
Trust Integrity (TI)	Early	100	3.1358	1.15013	-1.339	.184
	Late	100	3.3500	1.02309		
Perceived Decision Effort (PDE)	Early	100	2.3452	0.78214	1.261	.210
	Late	100	2.5046	0.98328		
Perceived Decision Quality (PDQ)	Early	100	3.5081	0.94525	-.029	.977
	Late	100	3.5040	0.94686		
Satisfaction (SAT)	Early	100	3.5762	0.95471	-.950	.345
	Late	100	3.4440	1.07788		
OPR Continuous Usage Intention (CUI)	Early	100	4.0017	1.07704	-.645	.521
	Late	100	3.9026	1.06425		

5.1.7. Exploratory Factor Analysis

Exploratory factor analysis (EFA) was conducted to confirm different dimensions underlying the data set and also to measure construct validity (Hair et al., 2010). A total of 45 items of the study constructs were subjected to EFA using SPSS (version 20). Prior to conducting the EFA test, the appropriateness of data for factor analysis was examined. All the items were inserted together in SPSS and factor analysis without rotation were ran. The inspection of the correlation matrix showed that the majority of the coefficients were above 0.30. The Kaiser Meyer-Olkin value was 0.955, exceeded the recommended

value of 0.60 (Kaiser, 1970), and Bartlett's Test of Sphericity achieved statistical significance, supporting the factorability of the correlation matrix (Bartlett, 1954).

Our research model is divided into three levels as follow: OPR evaluation beliefs (seven constructs consisting of 28 items, including three dimensions of trusting belief) for first level, OPR performance (three dimensions consisting of 13 items) for second level, and OPR continuous usage intention (4 items) for third level (Gattiker & Goodhue, 2005). The researcher executed EFA for each level, using the Eigen value cut off of 1.0 to identify the number of factors, with the "maximum likelihood estimation" as the extraction method. This method is suggested when the multivariate normality assumption is met (Hair et al., 2010). Since the collected data is approximately normal (see section 5.2.1), subsequently this study performed EFA test for each level. For EFA test, varimax rotation was selected. In EFA test, each item should load more strongly on its key factor as compared to its secondary factor. The guideline for verifying the items using EFA is as follows: (1) the item load on the predefined factor, (2) loading on the key factor should be considerably greater than 0.50, and (3) items that did not cross-load above the predefined factor. The EFA results is presented in Appendix-D1.

For the first level OPR evaluation beliefs, it consisted of seven constructs contained 28 items: perceived ease of use consisted of 5 items, perceived usefulness contained 5 items, perceived confirmation consisted of 3 items, competence trust consisted of 3 items, benevolence trust consisted of 3 items, integrity trust consisted of 4 items, and perceived enjoyment contained 5 items. All items were loaded more than 0.5 on their predefined factors, except 3 items of the benevolence trust that were loaded on another dimension: competence trust and their item loadings were around 0.5, consequently the benevolence trust dimension was dropped. After dropping the benevolence trust dimension, remaining

two dimensions; competence and integrity trust of trusting belief were further used to measure the second-order trusting belief formative construct in the subsequent analysis of measurement and structural models.

For the second level OPR performance, the initial measurement for OPR performance consisted of three dimensions and 13 items. First, perceived decision effort which predefined to include 4 items; second, perceived decision quality included 5 items; and third, satisfaction consisted of 4 items. After testing the EFA, three factors were extracted and items were loaded on their predefined factors. Consequently, all three constructs and related items were retained and used in subsequent analysis.

For third level OPR continuous usage intention, one factor was extracted as expected. All 4 items were loaded on the factor. The loading ranging from 0.967 to 0.984. The result of the exploratory factor analysis (EFA) is presented in Appendix-D1. The next section presents the examination of outliers.

5.1.8. Examination of Outliers

Outliers is "an observation that is substantially different from the other observations" (Hair et al., 2010). In other words, outliers refers to "an extreme response to a particular question or extreme response to all questions" (Hair Jr et al., 2013). Thus, a case that has below or above the majority of other cases is considered as an outlier (Pallant, 2010). The outliers have the potential to create undesirable effect on the correlation coefficient (Pallant, 2010). Therefore, it is important to check whether the outliers have strong impact on the results. The decision to retain or remove the outliers depends on their strength and impact on the results. Outliers can be checked by using SPSS. The researcher can identify

outliers by examining the box plot for each construct. In addition to that, the effect of outliers can be determined by comparing the mean of each construct with the 5% trimmed mean. If the mean value and 5% trimmed mean are very different, then further examination is required for those cases.

In this study, the researcher used "explore" option of the SPSS for identifying the outliers. The box plot for each construct reveals that a few outliers were present in some constructs (See Appendix-D3). Additionally, for examining their effect strength, the mean value was compared with the 5% trimmed mean of the respective construct. The results are presented in Table 5.3. The results showed that both means are almost similar. Given this and the fact that the values are not too different from the remaining distribution, the cases which are considered outliers can be retained.

The following section presents the assessment of multivariate assumption.

Table 5.3: Mean and 5% Trimmed Mean Outliers

Construct	Mean	5% Trimmed mean	Std. Deviation	Std. Error
OPR Continuous usage Intention	4.1740	4.2626	.91831	.03670
Satisfaction	3.5967	3.6337	.96915	.03874
Perceived Decision Quality	3.6229	3.6543	.86766	.03468
Perceived Decision Effort	2.3848	2.3507	.92544	.03699
Perceived Ease of Use	3.8355	3.8820	.94668	.03784
Perceived Usefulness	3.7845	3.8717	1.02674	04104
Perceived Confirmation	3.4505	3.4581	1.02674	03490
Competence Trust	3.9609	4.0195	.78445	.03135
Benevolence Trust	3.6534	3.6965	.90905	.03633
Integrity Trust	3.4238	3.4704	.94211	.03765
Trusting Belief	3.8071	3.8522	.78355	.03132
Perceived Enjoyment	3.5878	3.6135	.82461	.03296

5.2. Assessment of Multivariate Assumption

5.2.1. Testing for Normality

Normality is the one of essential assumptions in multivariate data analysis. It refers to a curve that is symmetrical and bell-shaped. The highest score frequency is shown in the middle, while lower score frequency is depicted the left and right extremes. Normality can be determined by examining the variable levels of skewness and kurtosis (Hair, Black, Babin, Anderson, & Tatham, 2006). Skewness refers to the balance of distribution, if it is unbalanced, then it would be positively skewed or negatively skewed. Kurtosis refers to the peakedness or flatness of the distribution. In this study, SPSS (version 20) was used to calculate the values of skewness and kurtosis. The ideal point for symmetrical distribution is zero (Hair et al., 2010). According to Hair et al. (2010), if the empirical Z value lies between ± 2.58 at 0.01 significance level; or ± 1.96 at 0.05 significance level, then the distribution of data is considered normal. As a rule of thumb, values for skewness and kurtosis with the range of ± 1 indicate a reasonably normal distribution (Hair et al., 2010). Lack of normality in data distribution can affect the results of the multivariate analysis. Hair Jr et al. (2013) stated that this problem is less severe with PLS-SEM. In this study, the results of skewness and kurtosis are within the range of ± 1. However, some values of skewness and kurtosis such as OPR continuous usage intention (-1.029 for skewness and 1.069 for kurtosis) and perceived usefulness (-1.195 for skewness and 1.049 for kurtosis) are above the range of ± 1. It shows that the distribution for these factors is relatively negatively skewed and more peaked than normal distribution. In retrospect with that, for other factors, the distribution is reasonably normal. The lack of normality is not severe with PLS-SEM, thus no further analysis on normality was conducted. Table 5.4 presents the values of skewness and kurtosis for normality assessment.

Table 5.4: Skewness and Kurtosis for Normality Assessment

Construct	Skewness	Std. Error	Kurtosis	Std. Error
OPR Continuous usage Intention	-1.029	.098	1.069	.195
Satisfaction	-.557	.099	-.251	.196
Perceived Decision Quality	-.747	.098	.282	.195
Perceived Decision Effort	.571	.098	-.115	.197
Perceived Ease of Use	-.636	.098	-.248	.195
Perceived Usefulness	-1.195	.098	1.049	.195
Perceived Confirmation	-.188	.099	-.283	.196
Competence Trust	-.807	.098	1.271	.195
Benevolence Trust	-.768	.098	.453	.195
Integrity Trust	-.751	.098	.442	.195
Trusting Belief	-.778	.098	1.018	.195
Perceived Enjoyment	-.428	.098	.310	.195

Furthermore, linearity can be tested by observing the Q-Q plots for all factors. Linearity is assumed when a straight line relationship is presented between the independent and dependent variables (Hair et al., 2006). Based on the visual verification of the Q-Q plots presented in Appendix-D3, it is clear that the Q-Q plot charts do not indicate any pattern of non-linearity as the dots are not far from a straight line. Therefore, the presence of linearity is observed across all factors.

5.2.2. Testing for Multi-collinearity

Multicollinearity refers to the relationships between explanatory variables and occurs when there are strong dependencies among them (Pallant, 2010). The presence of multicollinearity influences the results of the regression model by reducing the ability to predict dependent variable and determine the distinct effect of explanatory variables (Hair et al., 2010; Pallant, 2010). Therefore, the detection of this problem is necessary.

Multicollinearity is identified by checking the "Tolerance" and "Variance of Inflation Factor (VIF)" values for each regression variable (Hair et al., 2010; Pallant, 2010). Tolerance refer to percentage of variance in the predictor that cannot be accounted for by other predictors. The small tolerance value indicates that the predictor is redundant. If the tolerance value is less than 0.10, and VIF value is greater than 10, then it indicates that two predictors are highly correlated and may require further investigation (Hair et al., 2006). The study results on multicollinearity analysis which revealed that all the tolerance values are 0.232 or higher, and VIF values are less than 5. Consequently, the problem of multicollinearity is not an issue in this study. Table 5.5 presents the tolerance and VIF values for multicollinearity assessment.

Table 5.5: Multicollinearity Assessment

Dependent Variable	Independent Variables	Collinearity Statistics	
		Tolerance	VIF
OPR Continuous usage Intention	Satisfaction	.410	2.439
	Perceived Decision Quality	.225	4.442
	Perceived Decision Effort	.803	1.245
	Perceived Ease of Use	.920	1.087
	Perceived Usefulness	.293	3.407
	Perceived Confirmation	.382	2.619
	Competence Trust	.463	2.159
	Benevolence Trust	.250	3.999
	Integrity Trust	.321	3.115
	Perceived Enjoyment	.542	1.843

5.2.3. Common Method Bias

Common method bias (CMB) is "variance that is attributable to the measurement method rather than to the constructs the measures represent" (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, p. 879). It is a major contributor to systematic measurement error (Bagozzi, Yi, & Phillips, 1991). Like other forms of measurement error, if common

method bias is sufficiently high, then wrong conclusions may be drawn about hypothesized relationships between the constructs. Since both the dependent and independent variables were measured using the same instrument, then common method bias might cause systematic measurement errors. There are a number of recommended techniques and procedures for identifying and reducing common method biases. These approaches include "preventative procedures" aimed at reducing common method bias before data collection (Podsakoff et al., 2003), and statistical techniques for identifying and controlling or reducing the effects of bias during data analysis (Chin, Thatcher, & Wright, 2012; Chin, Thatcher, Wright, & Steel, 2013). In this study, both preventive procedures and statistical techniques were used to address the common method bias.

5.2.3.1. Preventative Procedural Techniques

Podsakoff et al. (2003) suggested several procedures for reducing or controlling common method bias (CMB), which are divided into five categories: (1) obtaining indicators of the predictor and criterion variables from different sources, (2) proximal, temporal, psychological and methodological separation of the measurement, (3) counterbalancing the question order, (4), protecting respondent anonymity, and (5) improving scale items. These precautions normally take place during the design phase of study and survey instrument development. This study followed both temporal and measurement separation guidelines by (i) measuring decision quality, decision effort, and dependent variable and their hypothesized predictors in the survey, and (ii) using different response formats/scales; a combination of Five Likert and semantic differential scales to capture constructs. It is also possible to minimize biases through the careful construction of the items themselves. For instance, Tourangeau, Rips, and Rasinski (2000) suggested a few practical advice for questionnaire design to reduce item ambiguity such as (a) defining or

explaining ambiguous/unfamiliar terms; (b) avoiding vague concepts and providing examples in order to explain such concepts; (c) keeping questions specific and simple, (d) decomposing questions into simpler questions. These guidelines were followed in the design and development of survey to diminish biases. For example, the survey provides definitions and brief explanations of concepts where necessary such as where the survey introduced the term online product recommendation (OPR) that has a specific meaning in the current study.

Another way to decrease biases is to use different scale end-points and formats for independent and dependent measures (Podsakoff et al., 2003), which were also applied in the survey instrument. In the current study, different anchor points were used for independent and dependent variables. For instance, in the judgement of product performance, 7-point Likert scales ranging from 1 for "Not at All" to 7 for "Very Well" was used; whereas for OPR continuous usage intention, 5-point Likert scales ranging from "Very Unlikely" to "Very Likely" was used; whereas for satisfaction, a semantic differential scale was used; and for the rest of constructs, 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". Further, verbal labels (Podsakoff et al., 2003) were included at the beginning, middle and end points of each scale, along with 'arrows' as visual cues to guide the respondents. Thus, it was expected that this can reduce CMB caused by commonalities in scale end-points and anchoring effects (Podsakoff et al., 2003).

Some researchers minimize the biases by counterbalancing the order of the measurement of the independent and dependent variables. In order to prevent respondents from easily combining related measurements, one option is to randomize the order of questions in the survey instrument (Chang, Van Witteloostuijn, & Eden, 2010). In the current study,

questions measuring independent variables and dependent variables were kept separate. The next section details the statistical techniques used for identifying CMB.

5.2.3.2. Statistical Techniques

This research also applied statistical techniques to determine to what degree any CMB exist and where possible, to control the bias. To date, a number of methods and statistical techniques have been recommended for detecting and controlling CMB using SPSS and SmartPLS (Chin et al., 2012). The most frequently used techniques for CMB analysis in prior IS studies are as follows: Harman's one-factor test (Podsakoff et al., 2003) and correlation Matrix (Bagozzi et al., 1991; Pavlou, Liang, & Xue, 2006). In addition to these techniques, the current study also apply unmeasured latent method construct (ULMC) in partial least square (PLS) introduced by Liang et al. (2007) and subsequently recommended by Podsakoff et al. (2012) for CMB analysis. The results of these techniques are discussed in the following subsections.

5.2.3.2.1. Harman's one-factor test

Harman's one-factor test is the first technique (Harman, 1960) that uses exploratory factor analysis where all variables are loaded onto a single factor and constrained with no rotation (Podsakoff et al., 2003). This new factor is typically not in the researcher's model; it is introduced exclusively for CMB analysis and then discarded. If this new common factor accounts to more than 50% of the variance, then CMB is likely to be a significant concern (Podsakoff et al., 2003).

Harman's one-factor test was performed by using SPSS (version 20). In this test, all items were entered into an un-rotated factor analysis and constrained the number of factors extracted to be one in order to determine to what extent a single factor accounts for the majority of variance. The results showed that the single factor accounted for 36% of variance that is less than 50% of the rules of thumb, indicating that CMB was unlikely to be a significant concern for the current study.

The Harman one factor technique has the benefit of simplicity. However, there are a number of weaknesses associated with this method (Eichhorn, 2014, p.4):

- It does not statistically control this type of variance.
- There are no specific guidelines on the amount of variation explained by this factor to determine the existence of this variance. The customary heuristic is to set the threshold to 50%.
- The method is sensitive to the number of variables involved. Large models have greater chance for multiple common method factors to exist. As the number of variables increases, this technique becomes less conservative.
- The sample may be subjected to multiple sources of bias but this technique assumes a single source which potentially misrepresents the actual bias.

However, Harman's one-factor test is increasingly questioned for its ability to identify CMB (Podsakoff et al. 2003), therefore the current study also considers correlation matrix analysis, to examine CMB, and is discussed in the following section.

5.2.3.2.2. Correlation Matrix Analysis

The current study also performed a test suggested by Pavlou et al. (2006) and Bagozzi et al. (1991). In this test, the construct correlation matrix as calculated using SmartPLS 2.0 is examined to determine whether the constructs have extremely high correlation (more than .90) or not. Any highly correlated variables are evidence of CMB; which usually results in extremely high correlations (Bagozzi et al., 1991). As shown in Table 5.6, none of these constructs were so highly correlated (less than 0.90). Thus, the results indicate that CMB is not a problem in this study.

Table 5.6: Correlation Matrix

Constructs	OPRCI	PDE	PDQ	SAT	PEOU	PU	PC	TC	TI	ENJ
Continuous usage Intention (OPRCI)	1.000									
Perceived Decision Effort (PDE)	-0.355	1.000								
Perceived Decision Quality (PDQ)	0.736	-0.386	1.000							
Satisfaction (SAT)	0.646	-0.339	0.696	1.000						
Perceived Ease of Use (PEOU)	0.268	-0.122	0.216	0.190	1.000					
Perceived Usefulness (PU)	0.725	-0.367	0.807	0.638	0.242	1.000				
Perceived Confirmation (PC)	0.563	-0.368	0.731	0.616	0.163	0.665	1.000			
Competence Trust (TC)	0.496	-0.315	0.589	0.496	0.133	0.508	0.546	1.000		
Integrity Trust (TI)	0.648	-0.379	0.743	0.621	0.186	0.716	0.652	0.586	1.000	
Perceived Enjoyment (ENJ)	0.457	-0.195	0.529	0.607	0.221	0.436	0.571	0.453	0.454	1.000

5.2.3.2.3. Unmeasured Latent Method Construct

Although, Harman's single factor and correlation test have been widely used, recently Guide and Ketokivi (2015) reported in their editorial note that both Harman's single factor and correlation test are no longer acceptable as they do not address CMB at all. Therefore, this study employed unmeasured latent method construct (ULMC) which is a more rigorous test of CMB test recommended by Podsakoff et al. (2012) and adapted to PLS

analysis by Liang et al. (2007). The goal of this technique is to assess the impact of CMB on measurements regarding the effect of the theorized constructs in the research model.

To apply this technique in PLS, theoretical constructs of the research model and their relationships are created for CMB analysis. Also, a single-item construct is created for each item in the measurement model. Each substantive construct is linked to the single-item constructs for the items that it comprises. It effectively makes each substantive construct in the model a second-order reflective construct. Additionally, a construct representing the common method construct is created, reflectively composed of all items of the instrument. Finally, paths are created between the method construct and each single-item construct. Figure 5.1 shows this approach.

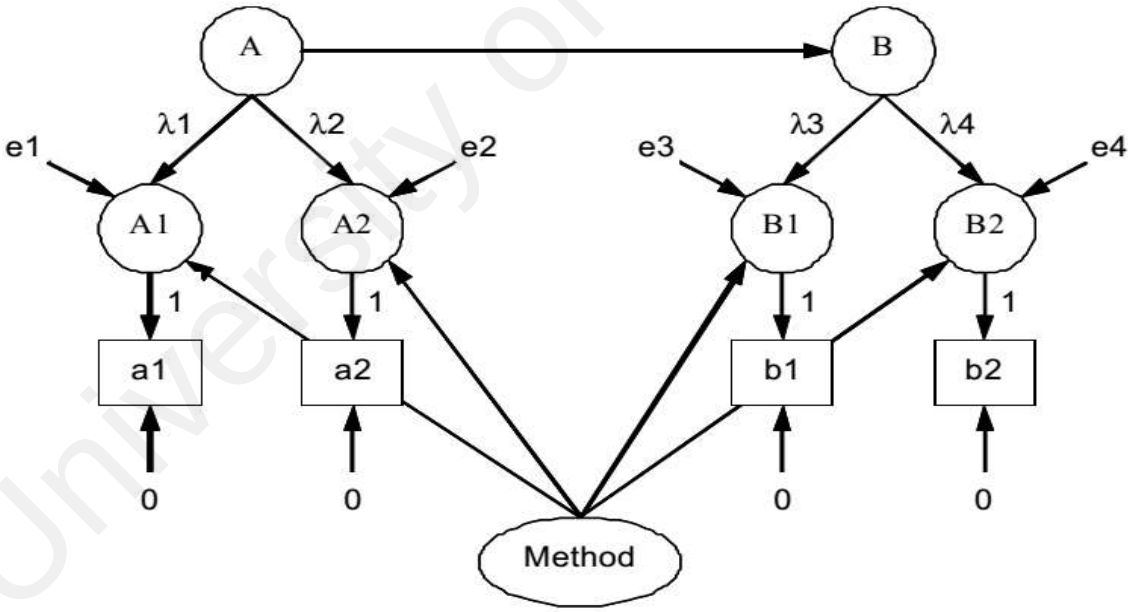


Figure 5.1. Liang et al. (2007, p. 86)'s Example of Modeling Indicators as Single-Item Constructs (Figure from "Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management," H. Liang, N. Saraf, Q. Hu, and Y. Xue, MIS Quarterly (31:1), 2007)

To interpret the findings, the coefficients of paths (from substantive constructs to single-item constructs, as well as coefficients of paths from the common method construct to single-items constructs,) are considered, loadings are represented by λ in the Table 5.7.

Following Marcoulides and Moustaki (2014) and Williams, Edwards, and Vandenberg (2003), CMB can be measured by examining the statistical significance of the loadings of the common method construct and by comparing the variance of each item as explained by the substantive and method factors. For both 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 substantive constructs are substantially greater than those explained by the method construct, then CMB is confirmed to have minimal influence and thus unlikely to be a significant concern. Applying these rules of thumb, as shown in Table 5.7, almost all loadings of the method construct are insignificant and the variance of items of substantive constructs is substantially greater than that of the method construct. The average variance because of substantive constructs is 85.6 percent versus 1.3 percent for the method constructs. It indicates that the effect due to the method construct is considerably smaller than that due to substantial constructs. In light of previous tests, and the results of this procedure, it is concluded that these results indicate a negligible effect caused due to CMB, and hence, it is not a significant concern in the current study.

Table 5.7. Unmeasured Latent Method Construct Results

Constructs	Indicators	Substantive Factor Loading (λs)	Variance Explained (λs^2)	Method Factor Loading (λm)	Variance Explained (λm^2)
OPR Continuous Usage Intention	OPRCI1	0.951	0.904	0.028	0.001
	OPRCI2	0.945	0.893	-0.035	0.001
	OPRCI3	0.956	0.914	-0.032	0.001
	OPRCI4	0.951	0.904	0.053	0.003
Perceived Decision Effort	PDE1	0.852	0.726	-0.037	0.001
	PDE2	0.936	0.876	-0.051	0.003
	PDE3	0.964	0.929	0.038	0.001
	PDE4	0.931	0.867	0.067	0.004
Perceived Decision Quality	PDQ1	0.913	0.834	0.025	0.001
	PDQ2	0.905	0.819	-0.083	0.007
	PDQ3	0.914	0.835	0.061	0.004
	PDQ4	0.853	0.728	0.052	0.003
	PDQ5	0.896	0.803	0.046	0.002
Satisfaction	SAT1	0.891	0.794	0.208	0.043
	SAT2	0.952	0.906	-0.056	0.003
	SAT3	0.941	0.885	-0.088	0.008
	SAT4	0.915	0.837	-0.093	0.009
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	-0.040	0.002
	EOU4	0.914	0.835	0.046	0.002
	EOU5	0.895	0.801	0.072	0.005
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	0.026	0.001
	PU4	0.892	0.796	0.086	0.007
	PU5	0.934	0.872	0.073	0.005
Perceived Confirmation	PC1	0.972	0.945	0.061	0.004
	PC2	0.889	0.790	0.518	0.268
	PC3	0.962	0.925	-0.139	0.019
Competence Trust	TC1	0.917	0.841	0.153	0.023
	TC2	0.935	0.874	-0.063	0.004
	TC3	0.918	0.843	0.053	0.003
Integrity Trust	TI1	0.925	0.856	0.141	0.020
	TI2	0.893	0.797	0.114	0.013
	TI3	0.942	0.887	0.053	0.003
	TI4	0.965	0.931	-0.032	0.001
Perceived Enjoyment	ENJ1	0.882	0.778	0.126	0.016
	ENJ2	0.915	0.837	0.052	0.003
	ENJ3	0.896	0.803	0.046	0.002
	ENJ4	0.902	0.814	-0.127	0.016
	ENJ5	0.945	0.893	-0.118	0.014
Average		**0.925**	**0.856**	**0.027**	**0.013**

5.3. Structural Equation Modelling- PLS-SEM Analysis

In this study, partial least square (PLS) technique is used to analyse data using SmartPLS (version 2 M3) for the assessment of measurement model and structural model. PLS is a latent structural equation modelling technique employing component based approach to estimation. The benefit of using PLS technique is that it allows the latent construct to be modelled either as reflective or formative constructs (Chin, Marcolin, & Newsted, 2003). Furthermore, PLS enabled the researcher to evaluate the measurement model and structural model simultaneously (Marcoulides & Saunders, 2006). In addition, PLS requires less demand on measurement scale and sample size (Chin, 1998).

According to Jarvis et al. (2003), there are four types of models contingent on the relationship among (1) first-order latent variables and their manifest variables, and (2) the second-order latent variables and the first order latent variables. These four types are as follows:

a) Type I : Reflective-Reflective
b) Type II: Reflective-Formative
c) Type III: Formative-Reflective
d) Type IV: Formative-Formative

Another reason of using the PLS technique is that the proposed research model consists of reflective-formative constructs (Type II) and formative-reflective constructs (Type III). OPR performance is modelled as formative mediating construct. For Type II and Type III, the OPR evaluation constructs are reflectively measured that do not share a common cause, and OPR performance as formative construct that fully mediates their influence on

subsequent dependent variables (Chin, 1998). However, this study follows systematic steps in the evaluation of measurement model and structural model using PLS technique. Table 5.8 summarizes three step assessment of PLS-SEM results.

Table 5.8: Systematic Assessment of PLS-SEM Results

Step 1: Assessment of the Measurement Model	
Step 1a: Reflective Measurement Model • Internal Consistency (Reliability) • Convergent Validity • Discriminant Validity	***Step 1b:*** Formative Measurement Model • Collinearity Test • Significance of Outer Weights • Nomological Validity
Step 2: Research Model Assessment and Validating Second-Order Construct	
Step 3: Assessment of Structural Model • Significance and relevance of the structural model path coefficients • Coefficient of determination R^2 • f^2 effect sizes • Goodness of Fit (GoF)	

In step 1 of the measurement model assessment, various reliability and validity measures are examined (Chin, 2010). In order to examine the measurement parameters, it is necessary to draw all relevant links between the constructs and their items (e.g. loadings), in addition to the linear links between the constructs (e.g. path coefficients) simultaneously (Chin, 2010). In this step, it is important to differentiate between reflective and formative constructs. They should not be treated as the same in the assessment of measurement model (Henseler et al., 2009). Reflective constructs are applicable to be assessed for reliability and validity using confirmatory factor analysis (CFA), whereas formative constructs are not applicable for reliability except validity (Henseler et al., 2009). Referring to the chapter 4, the type of each construct was assigned and discussed in detail under the measurement development section. Table 5.9 presents each construct type and number of items remaining after EFA test.

Table 5.9: Measurements and Construct Type

First-order Constructs	Type	No. of items	Second-order Construct	Type
OPR Continuous usage intention	Reflective	4		
Perceived Decision Effort	Reflective	4	**OPR Performance**	**Formative**
Perceived Decision Quality	Reflective	5		
Satisfaction	Reflective	4		
Perceived Ease of Use	Reflective	3		
Perceived Usefulness	Reflective	5		
Perceived Confirmation	Reflective	3		
Competence Trust	Reflective	3	**Trusting Belief**	**Formative**
Integrity Trust	Reflective	4		
Perceived Enjoyment	Reflective	5		

Consistent with past studies, all multi-item first-order constructs in this study are conceptualized as reflective. As discussed in Chapter 4, OPR performance is conceptualized as second-order formative construct consisting of three dimensions: perceived decision effort, perceived decision quality, and satisfaction; and trusting belief is also conceptualized as second-order formative construct containing two dimensions: competence trust and integrity trust.

In step 2, research model will be evaluated and second-order formative construct will be validated. The research model will be examined using unidimensional and multi-dimensional construct and the results will be compared. Lastly, the research model will be presented and confirmed based on this step's results.

In step 3, the structural model evaluation will be done after arriving at the final research model. Various evaluations will be conducted on the structural model by assessing the significance of path coefficients, coefficients of determination (R^2), effect size (f^2), and

examining the goodness fit of the model (GoF). The next section presents the assessment of measurement model.

5.3.1. Assessment of Measurement Model

Assessment of measurement model focuses on the reliability and validity of the final construct derived from exploratory factor analysis (see Appendix-D1). Confirmatory factor analysis (see Appendix-D2) was used to examine the measurement model for all constructs in order to explain how measured indicators logically represents the constructs in the model (Hair et al., 2006). There are two types of measurement model assessment under PLS-SEM: assessment of reflective model and assessment of formative model. The assessment of the reflective measurement model is based on the evaluation of internal consistency, convergent validity, and discriminant validity. The assessment of formative measurement model is based on the evaluation of collinearity testing, significance of outer weights, and nomological validity (Hair et al., 2013). The following three sub-sections presents the assessment of the measurement model.

5.3.1.1. Reflective Measures Reliability

In this study, the evaluation of the measurement model will be based on the reflective model, except the formative constructs: trusting belief and OPR performance will be assessed based on the formative model. For reflective model, the relationship between latent variables and their indicators were examined. Figure 5.2 depicts the measurement model with first order and second order constructs and number of items.

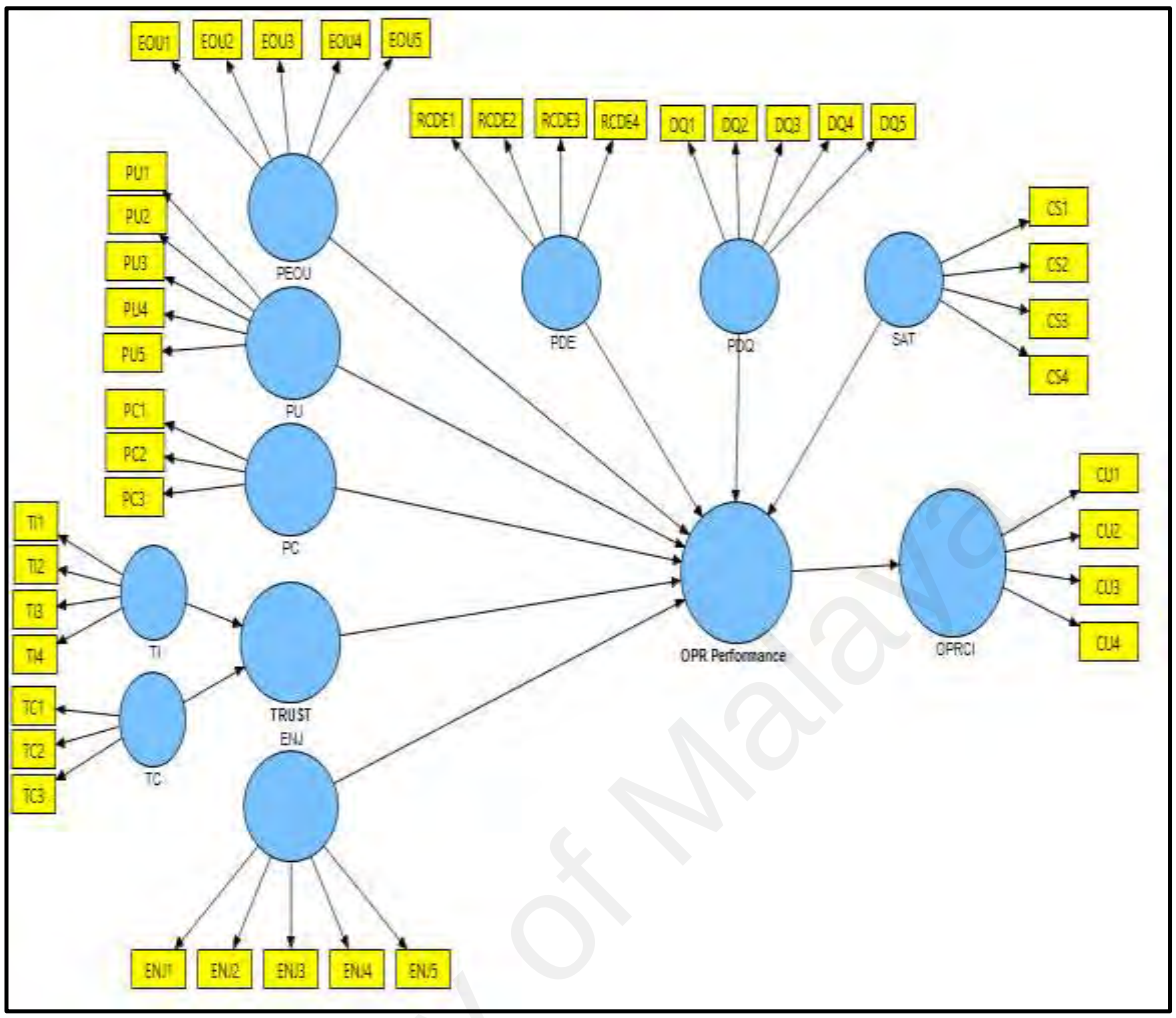


Figure 5.2: Measurement Model with Constructs and Indicators

In order to retain an item in the measurement model, it must have significant outer loading and should be greater than 0.708 (Hair Jr et al., 2013). The items that have outer loadings less than 0.7 should be deleted only if the deletion leads to the increment of AVE and composite reliability (Hair Jr et al., 2013). Figure 5.3 presents the measurement model of the study and outer loadings of the constructs. As shown in Figure 5.3, all indicators' outer loadings are above than the threshold value of 0.708. So, all items were retained in the measurement model for further analysis.

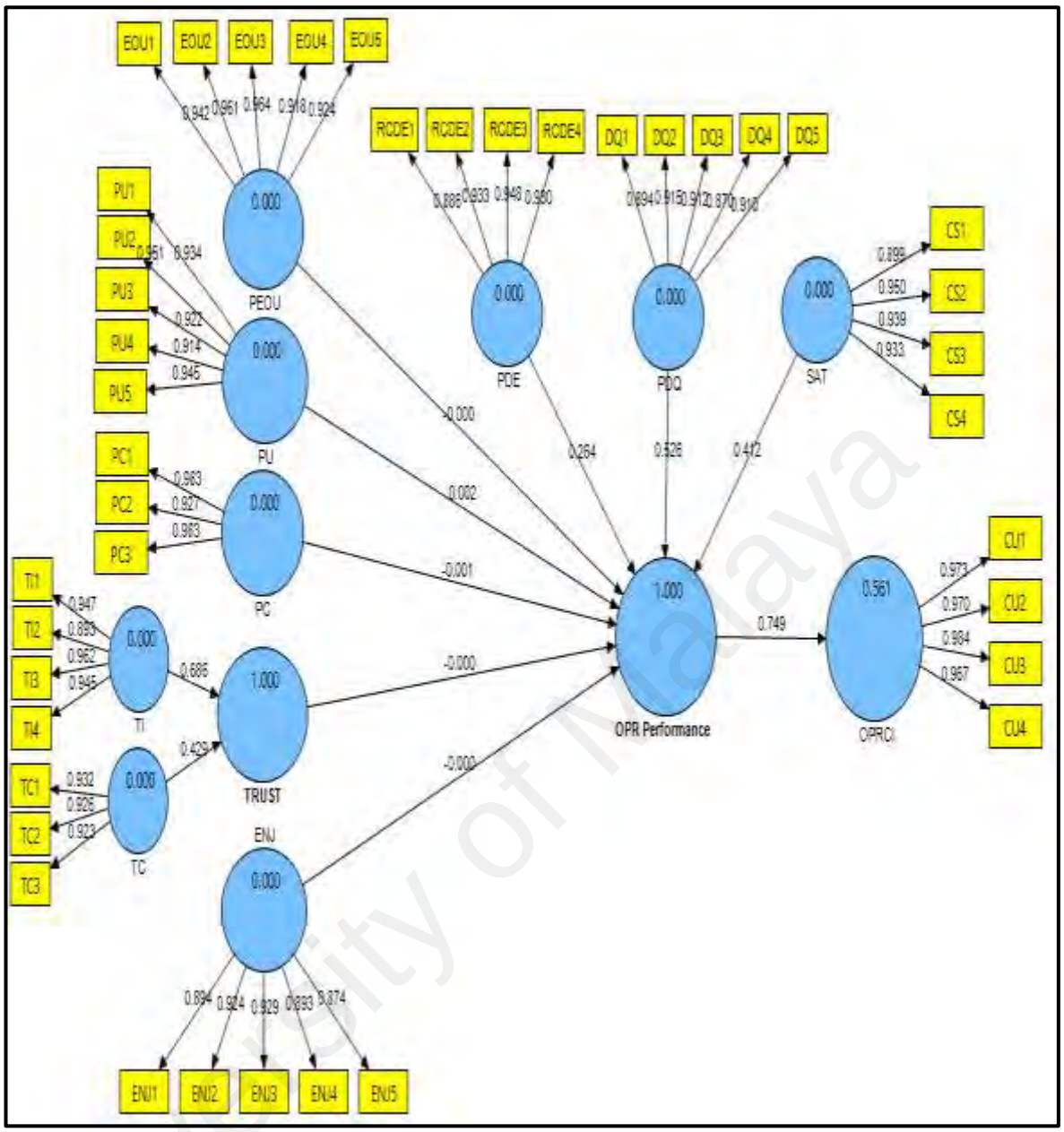


Figure 5.3: Measurement Model with Factor Loadings

Next, assessment of reflective measure reliability was examined. Reliability refers to the extent to which a variable/indicator or set of variables/indicators is consistent in what it is intended to measure (Hair et al., 2010). Cronbach's alpha and composite reliability were extracted by using PLS-SEM. For construct reliability, the value of Cronbach's alpha and composite reliability should be greater than 0.70 (Hair et al., 2014; Hair et al., 2010; Nunnally, 1978). As compared to Cronbach's alpha, the composite reliability is a

more rigorous evaluation of reliability (Chin, 2010). The reflective construct reliability is reported in Table 5.10. The reliability results show that all Cronbach's alpha and composite reliability are greater than 0.70. Consequently, all reflective items are within the acceptable level of reliability.

Table 5.10: Reflective Construct Reliability

Constructs	Cronbach's Alpha	Composite Reliability
OPR Continuous usage Intention (OPRCI)	0.9816	0.9864
Perceived OPR Performance	**Formative**	
Satisfaction (SAT)	0.9482	0.9626
Perceived Decision Effort (PDE)	0.9489	0.9633
Perceived Decision Quality (PDQ)	0.9414	0.9553
Perceived Ease of Use (EOU)	0.9683	0.9753
Perceived Usefulness (PU)	0.9629	0.9712
Perceived Confirmation (PC)	0.9620	0.9755
Trusting Belief in OPR	**Formative**	
Competence Trust	0.9185	0.9484
Integrity Trust	0.9665	0.9535
Perceived Enjoyment (ENJ)	0.9435	0.9567

5.3.1.2. Reflective Measures Validity

According to Hair et al. (2010), validity refers to which a measure correctly signifies what it is expected to measure or how well the concept is defined by the measure (s). There are two types of validity that applicable to reflective measure: convergent validity and discriminant validity. This study considers both in order to examine the reflective measures' validity.

A. Convergent Validity

Convergent validity refers to the degree to which measures of the same construct are correlated (Hair et al., 2014; Hair et al., 2010). Convergent validity can be assessed by the values of average variance extracted (AVE), which refers to the degree that 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 et al., 2014). Moreover, confirmatory factor analysis (CFA) is another indicator of convergent validity. This study runs CFA using PLS-SEM in order to examine the inter-factor and cross-factor loadings and results are presented in Appendix-D2. The convergent validity is realized if the items of each construct load exceed 0.70 on their construct as compare to other constructs (Hair et al., 2014).

Table 5.11 presents the items' outer loadings and AVE values for all reflective constructs. As shown in the Table 5.11, loadings for all items of the reflective construct is reported to have values greater than 0.80, and AVE values for all constructs are above than cut-off point of 0.70. Consequently, the convergent validity is achieved among all constructs.

Table 5.71: Items' Outer Loadings and AVE for Constructs

Constructs and Items	Outer Loadings	Sample Mean	Standard Deviation	Standard Error	T Statistics	AVE
Continuous Usage Intention						**0.948**
OPRCI1	0.973	0.973	0.005	0.005	211.842	
OPRCI2	0.970	0.970	0.006	0.006	168.287	
OPRCI3	0.984	0.984	0.003	0.003	399.979	
OPRCI4	0.967	0.967	0.006	0.006	168.556	
Perceived Decision Effort						**0.868**
PDE1	0.887	0.884	0.082	0.082	10.881	
PDE2	0.943	0.939	0.085	0.085	11.160	
PDE3	0.954	0.951	0.086	0.086	11.152	
PDE4	0.941	0.937	0.084	0.084	11.172	
Perceived Decision Quality						**0.810**
PDQ1	0.894	0.894	0.012	0.012	73.112	
PDQ2	0.915	0.914	0.012	0.012	76.034	
PDQ3	0.912	0.911	0.009	0.009	106.028	
PDQ4	0.870	0.871	0.014	0.014	61.091	
PDQ5	0.910	0.910	0.009	0.009	101.133	
Satisfaction						**0.866**
SAT1	0.900	0.900	0.014	0.014	66.263	
SAT2	0.950	0.950	0.008	0.008	127.437	
SAT3	0.939	0.938	0.008	0.008	122.005	
SAT4	0.933	0.933	0.007	0.007	125.405	
Perceived Ease of Use						**0.887**
EOU1	0.942	0.194	0.012	0.012	15.629	
EOU2	0.961	0.221	0.010	0.010	22.060	
EOU3	0.964	0.220	0.009	0.009	25.873	
EOU4	0.918	0.209	0.013	0.013	16.468	
EOU5	0.924	0.217	0.016	0.016	13.256	
Perceived Usefulness						**0.871**
PU1	0.934	0.933	0.008	0.008	120.354	
PU2	0.951	0.951	0.006	0.006	161.889	
PU3	0.922	0.922	0.010	0.010	96.530	
PU4	0.914	0.914	0.011	0.011	82.282	
PU5	0.945	0.945	0.008	0.008	123.184	
Perceived Confirmation						**0.930**
PC1	0.983	0.983	0.002	0.002	511.068	
PC2	0.927	0.927	0.009	0.009	103.443	
PC3	0.983	0.983	0.002	0.002	511.068	
Competence Trust						**0.859**
TC1	0.932	0.368	0.006	0.006	65.065	
TC2	0.926	0.349	0.005	0.005	66.086	
TC3	0.923	0.362	0.005	0.005	74.030	
Integrity Trust						**0.878**
TI1	0.947	0.270	0.003	0.003	90.570	
TI2	0.893	0.255	0.003	0.003	94.217	
TI3	0.962	0.275	0.003	0.003	87.123	
TI4	0.945	0.267	0.003	0.003	86.782	
Perceived Enjoyment						**0.816**
ENJ1	0.894	0.894	0.011	0.011	80.218	
ENJ2	0.924	0.924	0.009	0.009	100.281	
ENJ3	0.929	0.929	0.009	0.009	108.241	
ENJ4	0.893	0.892	0.012	0.012	76.901	
ENJ5	0.874	0.872	0.014	0.014	63.930	

B. Discriminant Validity

Discriminant validity refers to the degree to which construct is distinct from other constructs (Hair et al., 2010). There are two ways to assess the discriminant validity (Hair et al., 2010): (1) factor loading of each item must be greater than the cross loadings of items of other constructs, and (2) the level of correlation between the construct and other constructs with respect to AVE. For the first type of discriminant analysis, the CFA analysis was performed and the results showed that the scale items of the constructs are more strongly loaded on their respective constructs than other constructs (see Appendix-D2).

For second type of discriminant validity analysis, AVE values for each construct is compared with square of correlation values between the construct and other constructs (Chin, 2010; Thong et al., 2006). Table 5.12 shows the correlation matrix of constructs and AVE. The results reveal that the square root of all AVE values are greater than the inter-construct correlation values, indicating the achievement of discriminant validity.

Table 5.82: Correlation Matrix of the Constructs and AVEs

Constructs	OPRCI	PDE	PDQ	SAT	EOU	PU	PC	TC	TI	ENJ
Continuous usage intention (OPRCI)	**0.948**									
Perceived Decision Effort (PDE)	0.126	**0.868**								
Perceived Decision Quality (PDQ)	0.542	0.149	**0.810**							
Satisfaction (SAT)	0.417	0.115	0.484	**0.866**						
Perceived Ease of Use (EOU)	0.072	0.015	0.047	0.036	**0.887**					
Perceived Usefulness (PU)	0.525	0.135	0.652	0.406	0.059	**0.871**				
Perceived Confirmation (PC)	0.317	0.135	0.534	0.380	0.027	0.442	**0.930**			
Competence Trust (TC)	0.246	0.099	0.347	0.246	0.018	0.258	0.298	**0.859**		
Integrity Trust (TI)	0.420	0.144	0.552	0.386	0.034	0.512	0.425	0.343	**0.878**	
Perceived Enjoyment (ENJ)	0.209	0.038	0.280	0.368	0.049	0.190	0.325	0.205	0.206	**0.816**

Note: Diagonal values represents the AVE and other non-diagonal values are the square of correlation values.

Furthermore, Henseler, Ringle, and Sarstedt (2015) show 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 study. However, they propose a new technique based on the multitrait-multimethod matrix (HTMT) ratio to address discriminant validity in marketing literature. They further demonstrate that HTMT approach is superior as compared to the Fornell-Larcker criterion and the assessment of cross-loadings. Finally, they provide guidelines on how to handle discriminant validity issues in PLS-SEM. 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 et al. 2016).

In order to obtain the HTMT results, this study run the bootstrapping routine in SmartPLS 3. Henseler et al. (2015) suggest cut off point 0.85 and 0.90 for establishing discriminant validity between two reflective constructs. Whereas, $HTMT_{0.85}$ is the most conservative criterion. If HTMT ratio is below 0.85, then discriminant validity between the two constructs is established. As shown in Table 2.13, the results reveal that all HTMT ratios are less than 0.85 except ratio between PU and PDQ, indicating no discriminant validity problem in this study. In the light of previous tests and the results of HTMT test, it is concluded that discriminant validity is established in this study.

Table 5.13: HTMT Results

Constructs	OPRCI	PDE	PDQ	SAT	EOU	PU	PC	TC	TI	ENJ
Continuous Usage Intention (OPRCI)										
Perceived Decision Effort (PDE)	0.426									
Perceived Decision Quality (PDQ)	0.813	0.485								
Satisfaction (SAT)	0.704	0.489	0.747							
Perceived Ease of Use (EOU)	0.688	0.379	0.694	0.596						
Perceived Usefulness (PU)	0.817	0.471	0.881	0.703	0.746					
Perceived Confirmation (PC)	0.770	0.563	0.829	0.763	0.719	0.845				
Competence Trust (TC)	0.371	0.374	0.491	0.418	0.370	0.417	0.528			
Integrity Trust (TI)	0.765	0.555	0.824	0.804	0.624	0.804	0.803	0.539		
Perceived Enjoyment (ENJ)	0.643	0.456	0.733	0.648	0.523	0.685	0.732	0.501	0.730	

After validating the reflective measurement model based on internal consistency, convergent validity, and discriminant validity, the next section details the assessment of the formative construct.

5.3.1.3. Formative Measures Validity

Given the difference between reflective and formative constructs, validity should not be examined in the same manner for formative measures as for reflective measures (Petter et al., 2007). According to Hair et al. (2014), there are three stages to examine the formative measurements: (1) assessing the multicollinearity issue, (2) evaluating the significance and relevance of the formative indicators, and (3) examining the convergent validity of formative measure. The formative measure validity techniques are applied in this study, and are discussed in the following sub-section.

A. Formative Measures Multicollinearity

Hair et al. (2014) stated that the presence of collinearity between formative indicators influence the weights and statistical significance of the indicators. The level of collinearity can be assessed by tolerance value and variance inflation factor (VIF) value. To examine the collinearity, tolerance value should be 0.10 or lower, and VIF value should not be greater than 10, otherwise it would indicate a collinearity problem (Hair et al., 2006).

In this study, collinearity was examined for sub-construct of formative second-order constructs; trusting belief and OPR performance. The results collinearity analysis revealed that all the tolerance values are 0.232 or higher, and VIF values are less than 5,

so the problem of multicollinearity is not an issue in this study. Table 5.14 presents the results of multicollinearity check for formative second-order constructs: trusting belief and OPR performance construct.

Table 5.94: Multicollinearity Check OPR Performance and Trusting Belief

Formative Constructs	Dimensions	Collinearity Statistics	
		Tolerance	VIF
Perceived OPR Performance	Satisfaction	.413	2.421
	Decision Quality	.232	4.309
	Decision Effort	.809	1.236
Trusting Belief	Competence Trust	.463	2.159
	Integrity Trust	.321	3.115

B. Significance and Relevance of the Formative Indicators

Another important criteria for examining formative indicator and its relevance is by using its outer weights. Diamantopoulos and Winklhofer (2001) recommended that if the outer weight of any indicator for formative measure is insignificant, it is appropriate to remove the insignificant indicators until the paths are significant and a good fit is obtained (Petter, Straub, and Rai, 2007).

This study uses formative constructs during the second stage of the analysis, the latent variable scores of the first-order constructs were used as indicators for the formative constructs. Then, the outer weight scores and significance of indicators of formative construct were obtained through bootstrapping in PLS-SEM. Table 5.15 presents the outer weight and significance of the indicators for formative constructs: trusting belief and OPR performance. The results in Table 5.15 show that all formative indicators are

significant. Therefore, it is appropriate to include the formative indicators for further analysis.

Table 5.15: Formative Indicators Outer Weight and Significance

Formative Construct	Indicators	Outer Weights	Sample Mean	Standard Deviation	Standard Error	T Statistics
Perceived OPR Performance	Decision Effort	-0.245	-0.246	0.020	0.020	12.227
	Decision Quality	0.511	0.510	0.016	0.016	33.002
	Satisfaction	0.441	0.440	0.012	0.012	37.042
Trusting Belief	Competence Trust	0.429	0.429	0.0082	0.008	52.562
	Integrity Trust	0.686	0.686	0.013	0.013	52.577

C. Nomological Validity

A formative construct and its indicators are inherently dependent on the nomological network where the construct exists. The indicator weights will change as the nomological network changes (Cenfetelli & Bassellier, 2009). Therefore, it is important to examine the formative constructs across different nomological networks. In this study, the formative OPR performance construct is linked separately to both OPR evaluation constructs and OPR continuous usage intention construct, whereas the formative trusting belief is linked with the OPR performance (see Table 5.15, Figure 4, and Table 5.16). The results show that formative indicators' weight change occurs as nomological network changes. Thus, nomological validity holds true in this study. The next section presents the analysis of proposed of research model.

5.4. Analysis of Proposed Research Model

This section will analyse the proposed research model using PLS-SEM by proposing and examining the alternative models. First, full unidimensional model will be examined by treating all study constructs as first-order level constructs. Then, the proposed second-order OPR performance construct will be validated by evaluating each of its proposed dimensions separately with other hypothesized constructs, and comparing them with the results of second-order multidimensional OPR performance construct. At the end, the final research model will be presented based on the comparison of various alternative models.

5.4.1. Test for Overall Model Unidimensionality

All constructs of the research model are examined using PLS-SEM for their unidimensional relationships with all of the hypothesized constructs. The research model of relationships between unidimensional hypothesized constructs is shown in Figure 5.4 and the results for this test are presented in Table 5.16. The results show that all three unidimensional constructs (i.e. decision effort, decision quality, and satisfaction) are significantly related to OPR continuous usage intention. In addition to that, the results also revealed that six OPR evaluation factors including two dimensions of trusting belief (i.e. competence trust and integrity trust) are also significantly related to perceived decision effort, perceived decision quality, and satisfaction, except three hypothesized relationships (i.e. ease of use and decision effort, ease of use and decision quality, enjoyment and decision effort, enjoyment and decision quality, ease of use and satisfaction). The following subsection presents the test for second-order model of OPR performance.

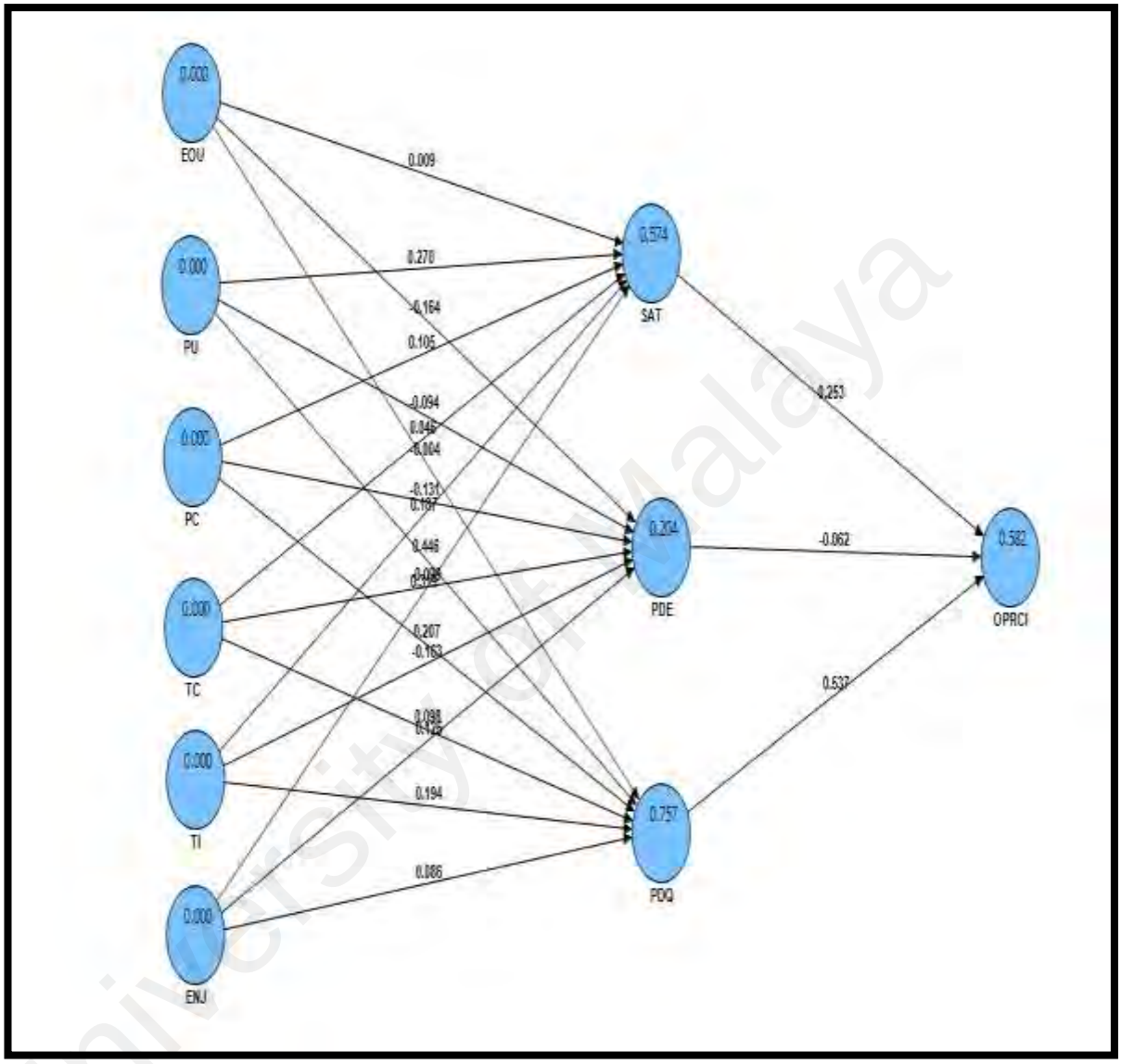


Figure 5.4: Measurement Model between Unidimensional Constructs

Legend:

OPRCI: OPR Continuous usage Intention, PDE: Perceived Decision Effort, PDQ: Perceived Decision Quality, SAT: Satisfaction, EOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TC: Competence Trust, TI: Integrity Trust, ENJ: Perceived Enjoyment.

Table 5.106: Research Model Unidimensionality Relationship Results

Dependent Construct	Independent Constructs	Path Coefficients	T Statistics	R2
OPR Continuance Intention				**0.582**
	Perceived Decision Effort	-0.062	2.197	
	Perceived Decision Quality	0.537	13.696	
	Satisfaction	0.253	6.630	
Satisfaction				**0.574**
	Perceived Ease of Use	0.009	0.235	
	Perceived Usefulness	0.270	5.539	
	Perceived Confirmation	0.126	2.735	
	Competence Trust	0.046	1.186	
	Integrity Trust	0.187	3.954	
	Perceived Enjoyment	0.309	7.250	
Perceived Decision Effort				**0.204**
	Perceived Ease of Use	-0.164	2.859	
	Perceived Usefulness	-0.094	1.443	
	Perceived Confirmation	-0.131	1.844	
	Competence Trust	-0.099	1.709	
	Integrity Trust	-0.163	2.436	
	Perceived Enjoyment	0.125	2.432	
Perceived Decision Quality				**0.757**
	Perceived Ease of Use	-0.004	0.152	
	Perceived Usefulness	0.446	10.399	
	Perceived Confirmation	0.207	5.007	
	Competence Trust	0.098	2.950	
	Integrity Trust	0.194	4.907	
	Perceived Enjoyment	0.086	2.557	

5.4.2. Test for Second-Order Model of OPR Performance

In this study, trusting belief and OPR performance are two hypothesized second-order formative constructs consisting of two dimensions and three dimensions, respectively. OPR performance consists of perceived decision effort, perceived decision quality, and satisfaction. Such measurement model is suitable for multidimensional composite construct of OPR performance, because each dimension emphasizes on various aspects of OPR performance in terms of OPR usage outcomes. Prior to evaluating the validity of second-order construct of OPR performance, the measurement properties of first-order constructs have been tested in terms of reliability, convergent validity, and discriminant validity in previous section 5.3.1. The results indicated that all first-order constructs had reliable and valid multiple item measurements.

For validating the second-order formative construct of OPR performance, alternative models are established for comparison purpose with respect to relative fit. The four alternative models are proposed based on three dimensions which are perceived decision effort, perceived decision quality, and satisfaction as mediators between five independent OPR evaluation constructs and one dependent OPR continuous usage intention construct. First, three dimensions of OPR performance; perceived decision effort, perceived decision quality, and satisfaction as independent variables are directly linked to the dependent construct of OPR continuous usage intention. Then, five OPR evaluation constructs; perceived ease of use, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment as independent variables are directly linked to each dimension of OPR performance: perceived decision effort, perceived decision quality, and satisfaction. These models are established to check the direct impact of independent variables on dependent variables. These four models are presented in Figure 5.5.

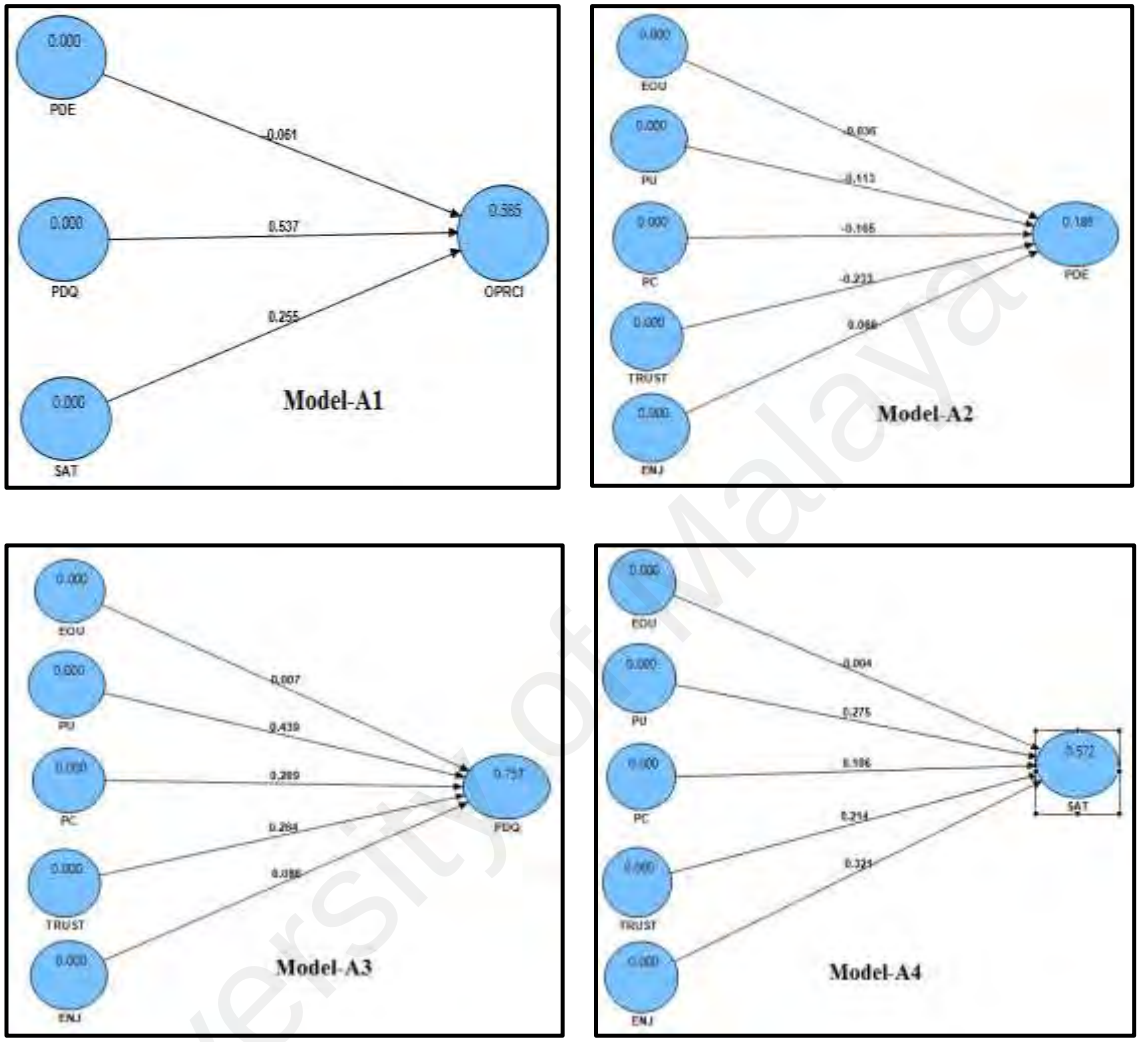


Figure 5.5: Direct Connection between Independent Constructs and Dependent Constructs

Legend:

OPRCI: OPR Continuous usage Intention, PDE: Perceived Decision Effort, PDQ: Perceived Decision Quality, SAT: Satisfaction, PEOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TRUST: Trusting Belief, ENJ: Perceived Enjoyment

Model-A1, connects three mediators; perceived decision effort, perceived decision quality, and satisfaction with dependent construct of OPR continuous usage intention. The results show that OPR continuous usage intention reported the R^2 is 0.585 (almost substantial) with significant relationships from all constructs, but perceived decision effort is negative and weak, perceived decision quality is positive and substantial, and satisfaction positive and moderate.

Model-A2, shows the direct links of the five independent OPR evaluation constructs; perceived ease of use, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment with perceived decision effort. The results show that perceived decision effort reported coefficient of determination (R^2) is 0.186 (weak) with negative, weak, and significant relationships from all constructs, except perceived ease of use and perceived enjoyment.

Model-A3, presents five independent constructs; perceived ease of use, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment with perceived decision quality. The results revealed that perceived decision quality reported R^2 as 0.757 (substantial) with positive, moderate, and significant relationships from all constructs, except perceived ease of use which is positive and insignificant.

Model-A4, links all five independent constructs; perceived ease of use, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment with satisfaction. The results show that satisfaction reported R^2 as 0.567 (substantial) with positive, weak, and significant relationships from all constructs, except perceived ease of

use, which is negative and insignificant. Table 5.17 summarizes the results from all four hypothesized first-order models.

Table 5.11: Results of First-Order Models

Model	Dependent Construct	Independent Constructs	Path Coefficients	T Statistics	R^2
Model-A1	**OPR Continuous usage Intention**				**0.585**
		Perceived Decision Effort	-0.061	2.329	
		Perceived Decision Quality	0.537	13.702	
		Satisfaction	0.255	6.531	
Model-A2	**Perceived Decision Effort**				**0.186**
		Perceived Ease of Use	-0.036	0.958	
		Perceived Usefulness	-0.113	2.106	
		Perceived Confirmation	-0.165	2.715	
		Trusting Belief	-0.233	3.754	
		Perceived Enjoyment	0.066	1.511	
Model-A3	**Perceived Decision Quality**				**0.757**
		Perceived Ease of Use	0.007	0.423	
		Perceived Usefulness	0.439	12.062	
		Perceived Confirmation	0.209	5.778	
		Trusting Belief	0.264	6.848	
		Perceived Enjoyment	0.086	3.027	
Model-A4	**Satisfaction**				**0.572**
		Perceived Ease of Use	-0.004	0.167	
		Perceived Usefulness	0.275	6.577	
		Perceived Confirmation	0.106	2.246	
		Trusting Belief	0.214	5.029	
		Perceived Enjoyment	0.321	7.846	

In this study, trusting belief and OPR performance are hypothesized to be second-order formative constructs. The researcher used two-stage approach in order to test the second-order construct. Two-stage approach is recommended in case when dimensions do not have same number of measurement items (Hair et al., 2014). The two-stage approach is implemented by using latent variable scores, which are calculated using PLS-SEM (Hair et al., 2014). The latent variable scores are directly linked to the higher order formative indicators.

Another six models are also established by creating relationships between first-order reflective constructs and second-order formative construct of OPR performance, as well as second-order formative construct of trusting belief. Trusting belief and OPR performance constructs are created by linking their respective dimensions using their latent construct scores. Then, the OPR performance construct is linked directly to the five independent OPR evaluation constructs and one dependent OPR continuous usage intention construct, as illustrated in Figure 5.6. These six models are described in the following sub-sections.

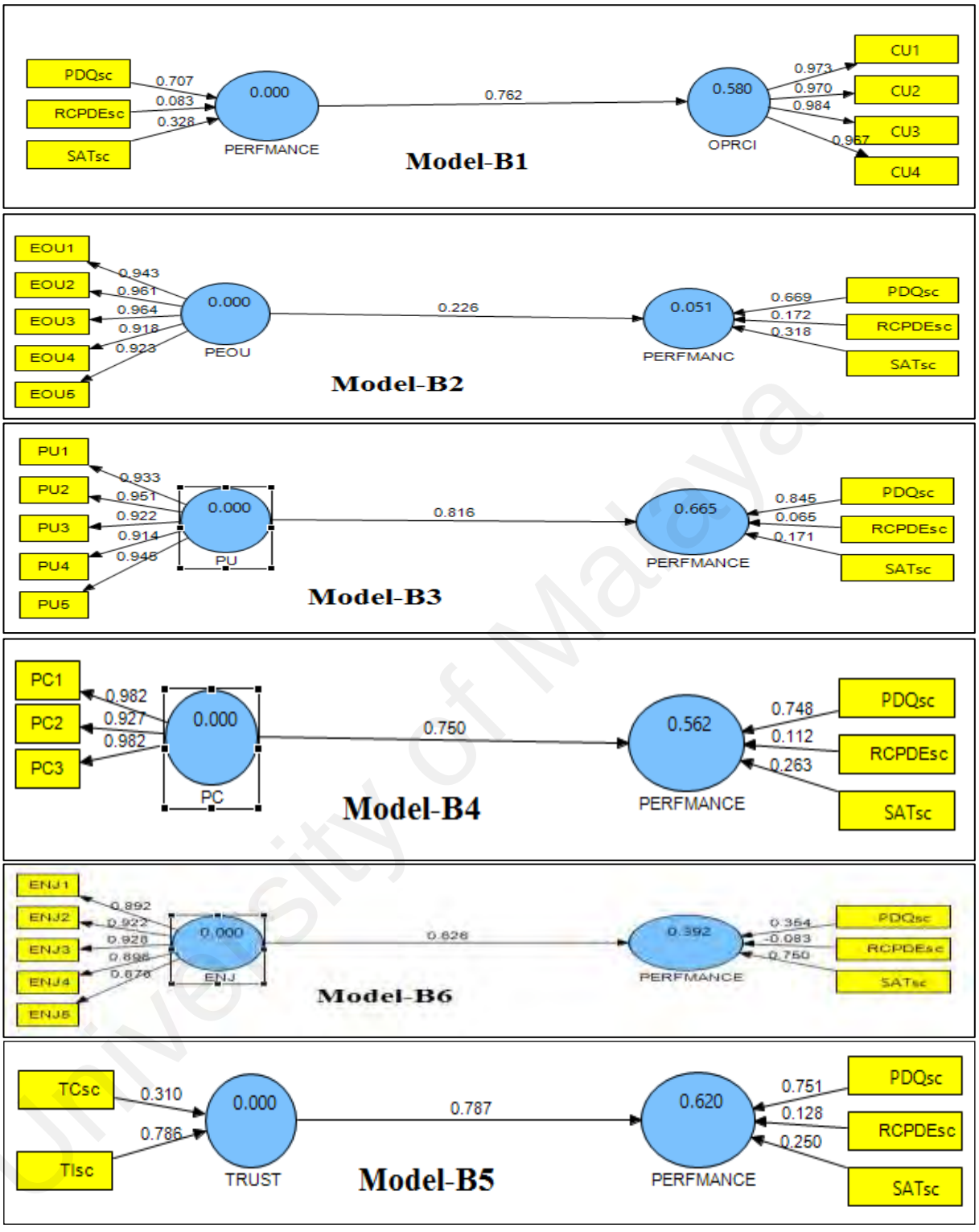


Figure 5.6: Direct Connections between First-Order Constructs and Second-Order OPR Performance Construct

Legend:

OPRCI: OPR Continuous usage Intention, PERFRMANCE: OPR Performance, PDEsc: Perceived Decision Effort Score, PDQsc: Perceived Decision Quality Score, SATsc: Satisfaction Score, PEOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TRUST: Trusting Belief, ENJ: Perceived Enjoyment.

Model-B1, presents the direct connection of second-order OPR performance as independent construct with first-order OPR continuous usage intention construct. The result shows high, positive and significant path coefficient of 0.762 between these two constructs. The model reports R^2 of 0.580, and in addition to that, the model shows that all outer weights between three indicators and their formative construct are significant.

Model-B2, shows the direct relationship between perceived ease of use first-order construct and OPR performance second-order construct. The result shows weak, positive, and significant path coefficient of 0.226 between the two constructs. The model reports determination of coefficient (R^2) of 0.051, which is weak. Additionally, the model shows that the outer weights of decision effort and satisfaction with their formative construct are insignificant.

Model-B3, presents the direct connection of perceived usefulness construct with OPR performance second-order construct. The result reveals high, positive, and significant path coefficient of 0.816 between these two constructs. The model reports R^2 of 0.665, and in addition to that, the model shows that all outer weights between three indicators and their formative construct are significant.

Model-B4, depicts the direct relationship perceived confirmation construct and OPR performance second-order construct. The result shows high, positive, and significant path coefficient of 0.750 between these two constructs. The model reports R^2 of 0.620, and moreover, the model reveals that all outer weights between three indicators and their formative constructs are significant.

Model-B5, presents the direct connection of second-order formative trusting belief construct with formative OPR performance construct. The result reveals high, positive, and significant path coefficient of 0.787 between these two constructs. The model reports R^2 of 0.572, and in addition to that, the model shows that all outer weights between three indicators and their formative construct are positive and significant.

Model-B6, shows the direct relationship perceived enjoyment construct and OPR performance. The result shows high, positive, and significant path coefficient of 0.626 between these two constructs. The model reports R^2 of 0.392. Additionally, the model reveals that all outer weights between three indicators and their formative construct are positive and significant, except the perceived decision effort dimension, which is not significant.

The results of these six models are summarized in following Table 5.18.

Table 5.18: Second-Order Models Results

Model	Independent Construct	Dependent Constructs	Outer Weight	Path Coefficients	T Statistics	R^2
Model-B1		**OPR Continuous usage Intention**		**0.762**	**43.873**	**0.580**
	Perceived OPR Performance					
	Decision Effort		-0.082		2.369	
	Decision Quality		0.707		14.279	
	Satisfaction		0.328		6.472	
Model-B2	**Perceived Ease of Use**			**0.226**	**4.703**	
		OPR Performance				**0.051**
		Decision Effort	0.172		0.878	
		Decision Quality	0.669		3.156	
		Satisfaction	0.318		1.448	
Model-B3	**Perceived Usefulness**			**0.816**	**47.781**	
		OPR Performance				**0.665**
		Decision Effort	0.065		2.220	
		Decision Quality	0.845		23.935	
		Satisfaction	0.171		4.058	
Model-B4	**Perceived Confirmation**			**0.75**	**38.125**	
		OPR Performance				**0.562**
		Decision Effort	0.112		2.371	
		Decision Quality	0.748		14.052	
		Satisfaction	0.264		4.520	
Model-B5	**Trusting Belief**			**0.787**	**26.866**	
		OPR Performance				**0.620**
		Decision Effort	0.128		3.553	
		Decision Quality	0.751		19.003	
		Satisfaction	0.25		5.643	
Model-B6	**Perceived Enjoyment**			**0.626**	**21.517**	
		OPR Performance				**0.392**
		Decision Effort	-0.083		1.431	
		Decision Quality	0.354		3.747	
		Satisfaction	0.750		9.147	

After establishing the above six second-order models based on one-to-one relationship between the constructs, a combined Model-C representing the connections of four independent first-order reflective constructs and one second-order formative trust construct with the second-order formative OPR performance construct is also developed. The hypothesized relationships are presented in Figure 5.7.

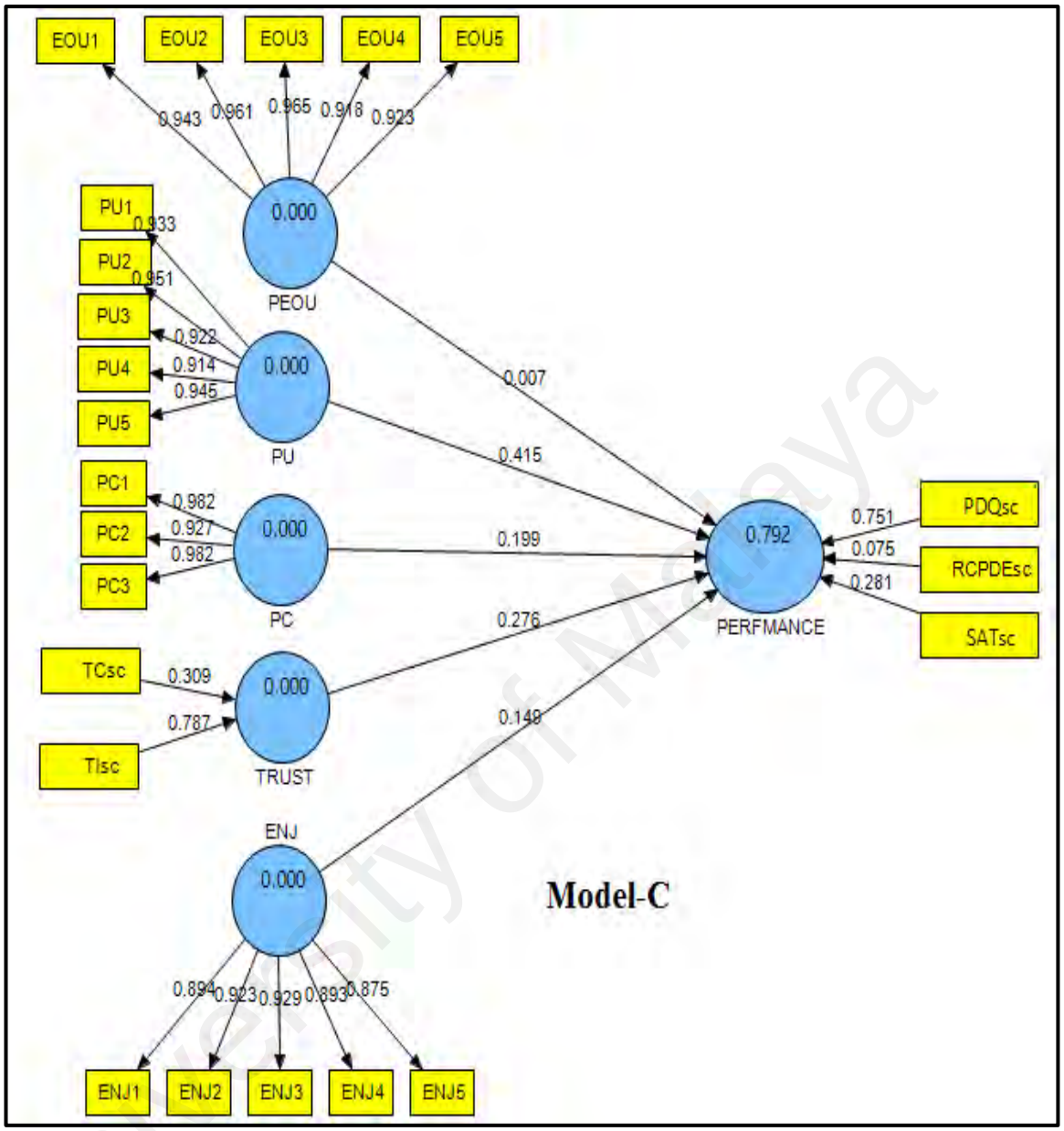


Figure 5.7: Direct Connections between First-Order Constructs and Second-Order Formative OPR Performance Construct

Legend:

OPRCI: OPR Continuous usage Intention, PERFRMANCE: OPR Performance, PDEsc: Perceived Decision Effort Score, PDQsc: Perceived Decision Quality Score, SATsc: Satisfaction Score, PEOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TRUST: Trusting Belief, ENJ: Perceived Enjoyment

Model-C presents the direct connection of five independent constructs and one second-order formative OPR performance construct. The result shows positive and significant path coefficient from all independent first-order constructs, except perceived ease of use, which is positive and insignificant. The model reports determination of coefficient (R^2) of 0.792, which is higher and greater than all above first-order and second-order models. In addition to that, the model reveals that all outer weights between three indicators and their formative construct are significant. Table 5.19 presents the results of second-order model-C.

Table 5.129: Results of Second-Order Model-C

Independent Constructs	Dependent Construct	Outer Weights	Path Coefficients	T Statistics	R^2
Perceived Ease of Use			0.007	0.379	
Perceived Usefulness			0.415	11.635	
Perceived Confirmation			0.199	6.009	
Trusting Belief			0.276	6.634	
Perceived Enjoyment			0.149	5.001	
	Perceived OPR Performance				**0.792**
	Decision Effort	0.075		2.890	
	Decision Quality	0.751		22.268	
	Satisfaction	0.281		7.183	

After comparing the model set (A1-A4) with model set (B1-B4) and model-C; where model set (A1-A4) deals with first-order independent and dependent constructs, and model set (B1-B4) and model-C that both utilize the second-order formative construct of OPR performance, the result revealed that the path coefficients for all constructs in model set (A1-A4) are lower than the path coefficients reported in model set (B1-B6) and model-C, whereas the level of significance in these models are similar. For example, in first-order reflective Model-A1, perceived ease of use was reported to be not significant and

perceived usefulness as significant, which is similar in second-order formative Model-C. Moreover, it is also realized that path coefficients of all constructs (decision effort, decision quality, and satisfaction) in Model-A1 are lower as compared to the outer weights reported in Model-B1 and Model-C. The sign and level of significance in these models are similar, for example, in Model-A1, decision quality is positive and significant, which is the same case in Model-B1 and Model-C. Furthermore, it is also found that the value of R^2 is reported similar in both Model-A1 and Model-B1. Hence, it confirms the validity of using trusting belief and OPR performance as a second-order formative-reflective constructs. The following section presents the final research model consisting of all proposed constructs.

5.4.3. Final Research Model

In prior sections, the researcher has evaluated the measurement model and provided empirical results that show and prove the reliability and validity of all study constructs. After that, the researcher validated the use of second-order formative-reflective trusting belief and OPR performance constructs by providing and comparing alternative models. Subsequently, Figure 5.8 presents the final research model consisting all proposed constructs in this study. The next section presents the assessment of the structural model for testing the hypotheses developed in Chapter 3.

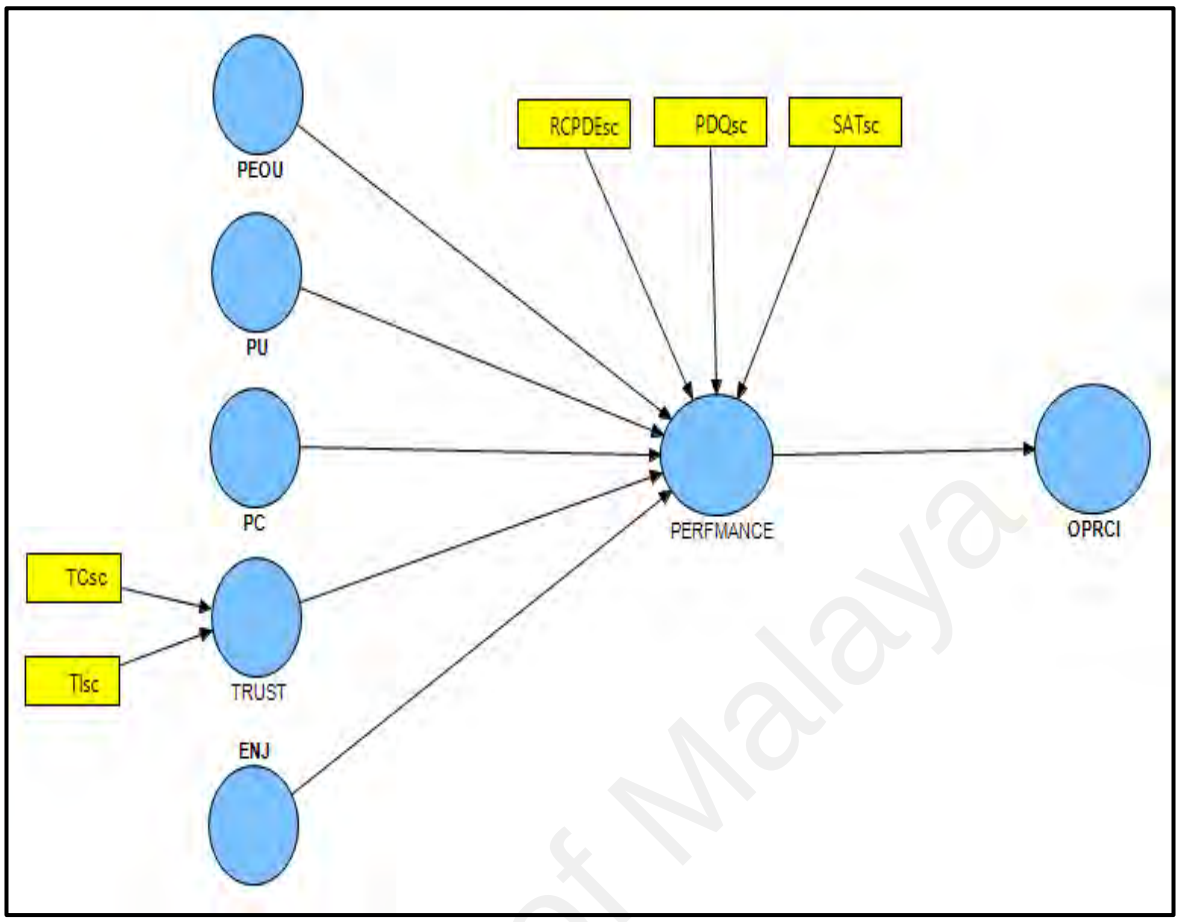


Figure 5.8: Final Research Model

Legend:
OPRCI: OPR Continuous usage Intention, PERFRMANCE: OPR Performance, PDEsc: Perceived Decision Effort Score, PDQsc: Perceived Decision Quality Score, SATsc: Satisfaction Score, PEOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TRUST: Trusting Belief, TCsc: Competence Trust Score, TIsc: Integrity Trust Score, ENJ: Perceived Enjoyment.

5.5. Assessment of Structural Model

The major objective of structural model assessment is to answer the research questions by testing the proposed research hypotheses. This study has six hypotheses based on the research model; H1-H6, which were developed and discussed in Chapter 3.

Once the empirical evidences with regards to the reliability and validity of the measurement model were found, the next step involves the assessment of the results from the structural model. The assessment of structural model shows how empirical data proves and supports the underlying theories used in this study (Hair et al., 2014). Moreover, it allows to examine the model's predictive capabilities and the relationships between hypothesized constructs. This study uses the following four criteria for evaluating the structural model using PLS-SEM: (1) significance of path coefficients, (2) level of coefficients of determination R^2, (3) the f^2 effect size, and (4) goodness of model fit. The following sections evaluate the structural model based on these criteria.

5.5.1. Significance and Relevance of the Path Coefficients

Based on the evaluation of various alternative models, a final research model was specified in the previous section and depicted in Figure 5.8. The structural model allows the evaluation of magnitude and significance level of path coefficients. However, assessment of the structural model using PLS-SEM requires the execution of bootstrapping. Table 5.20 presents the configuration and setting used to run the bootstrapping.

Table 5.13: Bootstrapping Settings

	Selected Option	Source
Sign Changes	No Sign Changes	(Hair et al., 2011; Hair et al., 2013)
Cases	626	
Samples	5000	

After running the bootstrapping procedure, the structural model with results is shown in Figure 5.8, and in addition to that, the results of path coefficient, t-statistics, and significance level are presented in Table 5.21. Since path coefficients are evaluated based on magnitude, sign, and significance level, the path coefficients have standard values between -1 to +1. The path coefficients close to +1 represent strong relationship, and the ones close to -1 represent strong negative relationship. The path coefficients that are close to 0 are considered weak relationships. Furthermore, significance level is examined based on t-statistics. When the t-value is above 1.96, then it can be assumed that path coefficient is significantly different from 0 at a significance level of 5 percent (α=0.05; two sided test). Similarly, for 1 percent and 10 percent, the probabilities of error are 2.57 and 1.65 respectively. As shown in Table 5.21, the results reveal that all path coefficients are reported to be at a significant level of 0.001, except perceived ease of use, which is not significant at p>0.10.

Table 5.21: Significance Testing Results of Path Coefficients

Hypotheses	Path Coefficient	t-Statistics	Significance Level
H1: OPR PERFMANCE ------> OPRCI	0.762	43.408	***
H1: PEOU ----------> OPR PERFMANCE	0.007	0.401	nc
H2: PU ----------> OPR PERFMANCE	0.413	11.724	***
H3: PC ----------> OPR PERFMANCE	0.198	6.157	***
H4: TRUST ----------> OPR PERFMANCE	0.276	6.967	***
H5: ENJ ----------> OPR PERFMANCE	0.154	5.667	***

Level of significance: ***p<0.001, nc: not significant at p>0.10

Legend:
OPRCI: OPR Continuous usage Intention, PERFMANCE: OPR Performance, PEOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TRUST: Trusting Belief, ENJ: Perceived Enjoyment

After assessing the significance of relationship between constructs, it is also important to evaluate the relevance of the strength of the relationship (Hair Jr et al., 2013). The strength of the relationship depends on the magnitude or size of the path coefficient. As shown in above Table 5.19, the results revealed that perceived usefulness, trusting belief, perceived confirmation, and perceived enjoyment significantly contribute to OPR performance. Perceived usefulness reports the highest contribution (b=0.413, t=11.724>2.58), followed by trusting belief (b=0.276, t=6.967>2.58), perceived confirmation (b=0.198, t=6.157>2.58), and then perceived enjoyment (b=0.154, t=5.667>2.58), which has the least influence on the OPR performance. The results also revealed that OPR performance has significant, superior, and strong impact on OPR continuous usage intention (b=0.762, t=43.408>2.58).

After discussing the significance and relevance of path coefficients, the next section details the coefficient of determination.

5.5.2. Coefficient of Determination (R^2)

The coefficient of determination (R^2) refers to a measure of model's predictive accuracy (Hair Jr et al., 2013). It represents the combined or joint impact of independent constructs on dependent construct (Hair Jr et al., 2013). In other words, the amount of variance is explained in dependent variable by all the independent variables which influence it (Hair Jr et al., 2013). According to Chin (2010), R^2 values of 0.67, 0.33 or 0.19 for dependent variables are considered as substantial, moderate, or weak, respectively. Whereas, Hair et al. (2011) stated that R^2 value of 0.75, 0.50, or 0.25 for dependent constructs are considered strong, moderate, or weak, respectively.

Figure 5.9 presents the structural model of this study and displays the coefficient of determination (R^2). However, the R^2 value for OPR performance is 0.792, which is strong or substantial. It indicates that 79.2% of the variance in OPR performance is explained by perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment. Whereas, the R^2 value for OPR continuous usage intention is 0.580, which can be considered substantial, and it means that 58% variance in OPR continuous usage intention is explained by OPR performance construct.

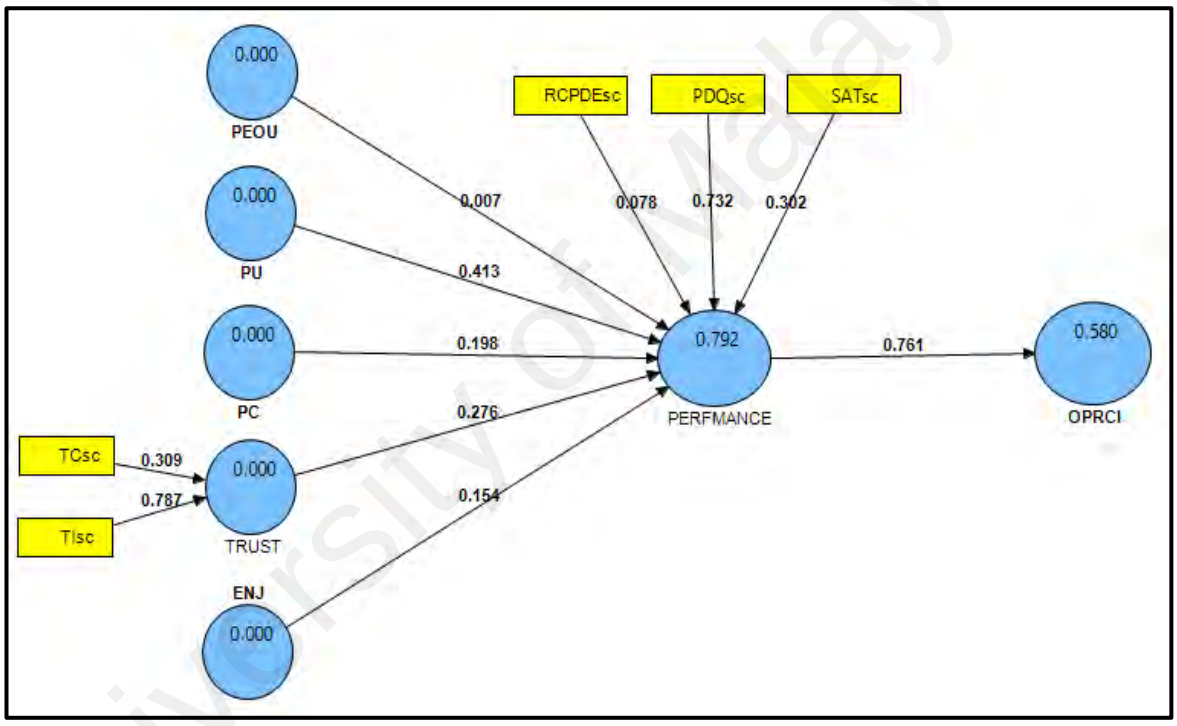


Figure 5.9: PLS-SEM Results: Path Coefficients and R^2

Legend:
OPRCI: OPR Continuous usage Intention, PERFRMANCE: OPR Performance, PEOU: Perceived Ease of Use, PU: Perceived Usefulness, PC: Perceived Confirmation, TRUST: Trusting Belief, ENJ: Perceived Enjoyment

After evaluating the structural model based on path coefficients and coefficient of determination (R^2), the following sections present analysis of control variables and effect size (f^2).

5.5.3. Control Variable: Product Type

To evaluate the structural model with regards to control variable of product type, following the study of Fichman and Kemerer (1997), three models were examined; full model, theoretical model, and control model. These three models are evaluated to provide a basis for examining the true impact of theoretical variables and to rule out alternative explanation (Teo, Wei, & Benbasat, 2003). Table 5.22 provides the results of structural model evaluation. The full model includes all variables including product type, while theoretical model includes predictors. Control model includes only the control variable of product type, which provides benchmark for examining the impact of six theoretical variables. The cell shows path coefficients and significant level are produced by PLS.

Examination of the full model reveals that path coefficients from predictors are highly significant, except perceived ease of use and product type. The overall model explains 58.8% of the variance. A comparison of full model and control model, full model explains an incremental variance of (58.8% - 1.5%) 57.3%. Contradictorily, the incremental variance is explained by the full model as compared to theoretical model that amounted to (58.8% - 58%) 0.8%. Since the difference is small, the results show that the theoretical model was sustentative enough to explain large proportion of variance in OPR continuous usage intention derived from OPR performance. Additionally, assessing the full model and theoretical model reveals that five hypotheses regarding the impact of OPR performance, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment, are significant in both cases indicating strong support for the theoretical model. Moreover, control model shows that the product type has significant impact on

OPR continuous usage intention. Table 5.22 illustrates the evaluation results of structural model.

Table 5.142: Evaluation of Structural Model

	Path Coefficients		
Constructs	**Full Model**	**Theoretical Model**	**Control Model**
Perceived OPR Performance	0.760***	0.762***	
Perceived Ease of Use	0.007[nc]	0.007[nc]	
Perceived Usefulness	0.413***	0.413***	
Perceived Confirmation	0.198***	0.198***	
Trusting Belief	0.276***	0.276***	
Perceived Enjoyment	0.154***	0.154***	
Product Type	0.012[nc]		0.121**
Variance explained by OPR continuous usage intention	**58.8%**	**58%**	**1.5%**

Level of significance: ***p<0.001, nc: not significant at p>0.10

5.5.4. Analysis of Effect Size f^2

The 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 Jr et al., 2013). The effect size f^2 is computed based on the following formula:

$$f^2 = \frac{R^2 included - R^2 excluded}{1 - R^2 included}$$

According to Chin (1998), the values of f^2 can be compared to 0.02, 0.15, or 0.35 to identify whether the independent variables have small, medium, or large effect, respectively. Table 5.23 presents the values of R^2 and f^2 for all independent variables on

dependent variables. The results revealed that perceived ease of use has no effect (f^2=0.000) and perceived usefulness has the largest effect (f^2=0.341). Whereas, trusting belief (f^2=0.144) has medium effect, and perceived confirmation (f^2=0.077) and perceived enjoyment (f^2=0.063) have small effects. Thus, it can be concluded that all independent variables together predict the OPR performance, except perceived ease of use.

Table 5.153: Construct Effect Size Results: R^2 and f^2 Values

Dependent Construct	Independent Construct	R^2 included	R^2 excluded	f^2
Perceived OPR Performance		0.792		
	Perceived Ease of Use		0.792	0.000
	Perceived Usefulness		0.721	0.341
	Perceived Confirmation		0.776	0.077
	Trusting Belief		0.762	0.144
	Perceived Enjoyment		0.779	0.063

5.5.5. Goodness of Fit (GoF)

Contrary to Covariance based-SEM that has the ability to apply the measures of goodness of fit, PLS-SEM is evaluated according to "heuristic criteria", for predictive capabilities of the theoretical model (Hair Jr et al., 2013). Tenenhaus, Vinzi, Chatelin, and Lauro (2005) reported that "*PLS path modelling does not optimize any global scalar function so that it naturally lacks of an index that can provide the user with a global validation of the model (as it is instead the case with and related measures in SEM-ML). The GoF represents an operational solution to this problem as it may be meant as an index for validating the PLS model globally*" (Tenenhaus, Amato, & Esposito Vinzi, 2004; Tenenhaus et al., 2005). Examining the goodness-of-fit (GoF) can be realized by

computing the geometric mean of the average communality and the average R^2 using the following equation:

$$GoF = \sqrt{Average\ Communality * Average\ R^2}$$

The indices for communality and R^2 are depicted in Table 5.24. R^2 are not to be calculated for independent variables. The goodness of fit (GoF) index is computed as follows:

$$GoF = \sqrt{0.834 * 0.686} = 0.756$$

It indicates that the theoretical model is able to take into account 75.6% of the achievable fit, and it is an indicative of the fact that the model is satisfactory (Tenenhaus et al., 2005).

Table 5.164: Communality and R^2

Constructs	Communality	R^2
OPR Continuous usage Intention	0.948	0.580
OPR Performance	0.620	0.792
Perceived Usefulness	0.888	-
Perceived Ease of Use	0.871	-
Perceived Confirmation	0.930	-
Trusting Belief	0.765	-
Perceived Enjoyment	0.816	-
Average	**0.834**	**0.686**

Finally, summary of the hypotheses testing is presented in Table 5.25. PLS-SEM results showed that all hypotheses are supported, except H_2.

Table 5.175: Summary of Hypotheses Testing

Hypotheses	Path Coefficient	t-Statistics	f^2	Results
H_1: Perceived OPR performance positively influence the consumers' OPR continuous usage intention.	0.762	43.408	-	Supported
H_2: Perceived ease of use has positive impact on consumers' perceived OPR performance.	0.007	0.401	0.000	Not Supported
H_3: Perceived usefulness is positively related to consumers' perceived OPR performance.	0.413	11.724	0.341	Supported
H_4: Perceived confirmation has positive impact on consumers' perceived OPR performance.	0.198	6.157	0.077	Supported
H_5: Trusting belief positively influence consumers' perceived OPR performance.	0.276	6.967	0.144	Supported
H_6: Perceived enjoyment has positive influence on consumers' perceived OPR performance.	0.154	5.667	0.063	Supported

5.6. Summary

This chapter presented data analysis into five parts; data preparation process, analysis of multivariate assumption, assessment of measurement model, analysis of proposed research model, and analysis of structural model. Data preparation was done using SPSS (version 20) and processes included data coding, data cleaning, missing data handling, monotone response pattern analysis, demographic analysis, assessment of non-response bias, exploratory factor analysis (EFA), and examination of outliers. Then, analysis of multivariate assumptions was done by introducing the test of normality, test of multi-collinearity, and common method bias. After that, Partial Least Square Structural Equation Modeling (PLS-SEM) was used to examine the reflective measure reliability and validity as well as formative measure validity in addition to confirmatory factor analysis (CFA). Then, the proposed research model was analysed using PLS-SEM by proposing and examining the alternative models. In the end, the final structural model was used to test the hypotheses as well as a comparison is made between full model, theoretical model, and control model. All hypotheses are accepted except H_2. The following Chapter 6 presents the interpretation and discussion on the results.

CHAPTER 6

DICUSSION AND CONCLUSION

6. Introduction

This chapter concludes and discusses the findings of this study. The chapter is divided into five sections. The first section provides an overview of the research and summarizes the research process. The second section presents the discussions and interpretations of the main findings of this study. The third section signifies the research implications for theory, methodology, and practices. Meanwhile, the fourth section outlines the study limitations and suggestion for future research. Finally, the fifth section concludes this study.

6.1. Research Overview

The primary objective of this research was to identify salient determinants of OPR continuous usage intention and to understand how they influence the dependent variable. More specifically, how do instrumental, social-psychological, and affective beliefs of OPR evaluation influence consumers' perceived OPR performance which ultimately determine their OPR continuous usage intention? In align with the main research objective and research question, the following two research questions (RQs) were posed:

RQ1: How does consumers' perceived OPR performance influence their OPR continuous usage intention?

RQ2: What are the most salient instrumental, social-psychological, and affective beliefs of OPR evaluation that influence consumers' perception of OPR performance?

In consonance with the above research questions, the following two research objectives (ROs) were specified:

RO1: To examine how consumers' perceived OPR performance (i.e., decision effort, decision quality, and satisfaction) influence their OPR continuous usage intention.

RO2: To investigate the role of instrumental (i.e. ease of use and usefulness), social-psychological (i.e. confirmation and trusting beliefs), and affective (i.e. enjoyment) beliefs of OPR evaluation in influencing consumers' perceived OPR performance.

The study focuses on five OPR evaluation factors (i.e. ease of use, usefulness, confirmation, trust, and enjoyment) and three dimensions of OPR performance (i.e. satisfaction, decision effort, and decision quality) in predicting consumers' OPR continuous usage intention. Five evaluation factors represent three different categories of consumers' beliefs: (1) instrumental factors (i.e. ease of use, usefulness), (2) social-psychological factors (i.e. expectation-confirmation, trust), and (3) affective factor (i.e. enjoyment). These five OPR evaluation factors are considered salient determinants of consumers' perceived OPR performance in terms of reduced decision effort, increased decision quality and satisfaction, which subsequently would more likely lead to OPR continuous usage for future purchase. These OPR evaluation factors refer to consumers'

perception of measuring instrumentality and honesty of the OPR (Baum & Spann, 2014; Benlian et al., 2012). Based on the literature review (e.g. Baum & Spann, 2014; Benbasat & Wang, 2005; Benlian et al., 2012; Fang et al., 2014; Huang et al., 2013; Lee, 2010; McKinney, Yoon, & Zahedi, 2002; Thong et al., 2006; Xiao and Benbasat, 2007; Xu et al., 2014), it is argued that the OPR evaluation factors are suitable to develop consumers' positive perception of OPR performance, when they perceive that the OPR is easy to use, useful, trustworthy, enjoyable, and fulfil their expectations.

Furthermore, from consumers' perspective, decision effort, decision quality, and satisfaction are the key factors that determine their behavioural response towards OPR continuous usage. Several researchers (e.g. Häubl & Murray, 2006; Xiao & Benbasat, 2007; Xu et al., 2014) separately reported that the decision effort, decision quality, and satisfaction are the premier factors that determine the success or failure of OPR. These studies highlighted that a typical decision maker often faces two objectives: to maximize accuracy (decision quality) and to minimize effort (decision effort). In order to conserve the decision effort and improve decision quality, consumers use OPR to facilitate their buying decision. The consumers believe that OPR usage reduces decision effort and improves buying decision quality, are driving forces in determining the OPR continuous usage (Xu et al., 2014). If the consumers perceive that the OPR do not facilitate in decreasing decision effort and increasing decision quality, then they would more likely rely on their own capability rather on OPR and subsequently may stop using OPR. Similarly, if consumer are not satisfied with the OPR, then they would more likely to discontinue OPR use for future purchase. Therefore, consumers' perceived OPR performance in terms of decision effort, decision quality, and satisfaction would play a critical role in determining their OPR continuous usage intention.

In order to answer research questions and to achieve research objectives, this study is conducted in three phases: (1) model and measure development, (2) field survey and data analysis, and (3) survey outcomes: discussion and implications. The first phase begins with systematic literature review on the latest peer-reviewed articles, books, journals, and dissertations in order to examine their findings in relation to OPR evaluation factors, OPR performance, and OPR reuse intention over the three stages of adoption process. This study investigated the factors pertaining to OPR effectiveness on consumers' perceptions of adopting services over three stages of pre-usage, initial usage, and continued usage. The analysis of the literature was conducted in accordance to the "Five Steps Grounded Theory Literature Review Method". However, based on the literature, research gaps were identified and subsequently a research model was developed in accordance to the research objectives. The literature content analysis was done to identify the appropriate OPR evaluation factors that influence the OPR performance and consumers' OPR continuous usage intention. The systematic content analysis revealed 27 factors representing five dimensions of consumer's response towards OPR usage over three stages of adoption process. From content analysis, consumers' perceived decision effort, decision quality, and satisfaction were found to be the most suitable representative of OPR performance, especially with regards to the context of voluntary use, as they were used to examine consumers' OPR usage outcomes (Häubl & Murray, 2006; Häubl & Trifts, 2000; Xiao & Benbasat, 2007; Xu et al., 2014). With reference to content analysis, five frequently used factors related to OPR evaluation such as perceived ease of use, perceived usefulness, perceived confirmation, trusting belief, and perceived enjoyment were identified. Based on the literature, the first two factors; ease of use and usefulness, had been used as instrumental factors of system evaluation in prior studies (e.g. Benlian et al., 2010, 2012; Bhattacherjee, 2001b; Lee, 2010; Thong et al., 2006), whereas two factors; perceived confirmation and trusting beliefs were considered social-psychological factors (e.g.

Bhattacherjee, 2001b; Gefen et al., 2003; Robinson, 1996; Sztompka, 1999), and last factor; perceived enjoyment had been used to capture individuals' affective feelings (e.g. Cyr et al., 2009; Kamis et al., 2008; Koufaris, 2002; Sun & Zhang, 2008; Van der Heijden, 2004; Xu et al., 2013). The five OPR evaluation factors originally belongs to four theoretical models: (1) IS continuance model, (2) effort-accuracy model, (3) trust formation theory, and (4) flow theory. Subsequently, an integrated theoretical model and hypotheses were developed to fulfil the research objectives.

The second phase involves the determination of study sample, survey instrumentation, and data collection. The sample of this study was drawn from a population of Amazon customers over fourteen different countries, mostly European and USA. A data collection was done through online survey. Whereas, survey questionnaire was designed based on previous studies. To confirm the face and content validity of the survey questionnaire, an expert panel consultation and a pretesting of the survey questionnaire were conducted. Subsequently, necessary suggestions were taken into consideration. Then, a pilot study was conducted with the target population of this study and the internal consistency was examined in order to ensure the reliability of the proposed constructs. Finally, the online survey was sent to 3500 Amazon customers with a brief explanation of the study purpose and invitation for participations. Data collection period of seventeen weeks produced 751 responses, resulting in a response rate of 22%. Out of 751 responses, 626 responses were used for the data analysis.

Finally, the last phase focuses on the analysis of the collected data. Since, this study is quantitative with a deductive approach. The survey data was prepared using SPSS (version 20), which includes data coding, data cleaning, missing data handling, and deleting monotone response. The SPSS was used for demographic analysis, assessment

of non-response bias, exploratory factor analysis (EFA), examination of outliers, test of normality, test of multi-collinearity, and common method bias. Further analysis was conducted using Partial Least Square Structural Equation Modelling (PLS-SEM). PLS-SEM was used to examine the reflective measure reliability and validity as well as formative measure validity in addition to confirmatory factor analysis (CFA). Then, the proposed research model was analysed using PLS-SEM by proposing and examining the alternative models. In the end, the final structural model was used to test the hypotheses and empirical answers to the research questions were provided. Additionally, a comparison between full model, theoretical model, and control model was also done to ascertain the true impact of theoretical model. The results proved that the relationship between OPR performance and OPR continuous usage intention is rather significant. In addition to that, the direct relationships between five OPR evaluation factors and OPR performance were statistically supported, except the impact of perceived ease of use. However, out of total six hypotheses, five were statistically significant and supported. The summary of the research findings is presented in Table 6.1. The following section will discuss the research findings in depth.

Table 6.1: Summary of the Research Findings

Research Questions	Research Objectives	Research Hypotheses	Research Findings	Comments (Confirmation and Contradiction)
RQ1: How does consumers' perceived OPR performance influence their OPR continuous usage intention?	RO1: To examine how consumers' perceived OPR performance (i.e. satisfaction, decision effort, and decision quality) influence their OPR continuous usage intention.	H1: Perceived OPR performance positively influence consumers' OPR continuous usage intention	Supported	This finding empirically validated the proposition of the study by Xiao and Benbasat (2007) that the consumers' perception of decision variables (decision effort and decision quality) and satisfaction have relationship with their intention to future OPR use. Similarly, the finding also confirmed the notions of the experimental studies by Häubl and Murray (2006) and Häubl and Trifts (2000) that the consumers would most likely to continue using OPR, if they are satisfied with the OPR usage in the result of their expectation-confirmation regarding less decision effort exerted and improved decision quality. Moreover, it also extends the findings of experimental study by Xu et al. (2014) that perceived decision effort and decision quality significantly influence the consumers' intention to reuse for future buying from adoption to post-adoption stage. The finding further confirmed the robustness of satisfaction-continuous usage intention relationship reported in various past IS studies (e.g. Bhattacherjee, 2001b; Lee, 2010; Thong et al., 2006).
RQ2: What are the instrumental, social-psychological, and affective beliefs of OPR evaluation that influence consumers' perceived OPR performance?	RO2: To investigate the role of instrumental (i.e. ease of use and usefulness), social-psychological (i.e. confirmation and trusting beliefs), and affective (i.e. enjoyment) beliefs of OPR evaluation in influencing consumers' perceived OPR performance (i.e. decision effort, decision quality, and satisfaction).	H2: Perceived ease of use has positive impact on consumers' perceived OPR performance (reduced decision effort, and increased decision quality and satisfaction).	Not Supported	The finding of this relationship support the argument of Bhattacherjee (2001b) for not including the perceived ease of use in IS continuance model. Bhattacherjee (2001b) argued based on the observation of Karahanna et al. (1999) that "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' job performance" (p. 200). In contrast, the results of this study contradict with the findings of the studies by Thong et al. (2006) and Lee (2010), who found that perceived ease of use as an IS evaluation factor play significant role in the continuous usage of the target technology. Therefore, the current result reaffirms the argument of Karahanna et al. (1999) and Bhattacherjee (2001ab), and contradict with findings of Thong et al. (2006) and Lee (2010) regarding the saliency of perceived ease of use in predicting continuous usage intention.

		H3: Perceived usefulness is positively related to consumer' perceived OPR performance (reduced decision effort, and increased decision quality and satisfaction).	Supported	The findings supported by past studies (Benlian et al., 2012; Häubl & Trifts, 2000; Seo et al., 2013; Xu et al., 2014) which regards the perceived usefulness as positive belief in the OPR characteristics, information, and product diagnosticity. For example, Xu et al. (2014) found that perceived product diagnosticity as usefulness of OPR significantly influence perceived decision effort and decision quality. They highlighted that if consumers do not perceive the usefulness of OPR in terms of product evaluation, then it will result in greater cognitive effort and less decision accuracy in making buying decision. Furthermore, the current findings also consistent with the argument of Bhattacherjee, (2001) and Thong et al., (2006) that perceived usefulness is the most salient predicting factor in IS context due to its consistent significant impact on attitude over both initial and post-adoption stages. Therefore, the current result revalidated the impact of perceived usefulness on satisfaction, and also confirmed the extended influence of perceived usefulness on decision effort and decision quality.
		H4: Perceived confirmation has positive impact on consumer' perceived OPR performance (reduced decision effort, and increased decision quality and satisfaction).	Supported	The findings support the past studies (Komiak & Benbasat, 2006; Wang & Benbasat, 2004; Xiao & Benbasat, 2007) which have conceptually highlighted the importance of considering and managing the customers' expectations in the design of OPR, particularly in terms of decision effort and decision quality. For example, Xiao and Benbasat (2007) propose that the consumers might stop using OPR, when the OPR do not fulfil their expectations of making better buying decision and reduced decision effort. Additionally, it also revalidated the positive relationships between perceived confirmation and satisfaction that found by various past IS studies conducted in different context such as e-learning (Islam, 2012; Lee, 2010), web portal usage (Kang et al., 2009), and e-commerce service (Bhattacherjee, 2001a). Furthermore, this study also extended their findings by empirically testing the impact of perceived confirmation on additional factors; decision effort and decision quality which supported the need to broaden the effect mechanisms of perceived confirmation depending on the nature of the IS examined (Benbasat and Zmud 2003).

		H5: Trusting belief positively influence consumer' perceived OPR performance (reduced decision effort, and increased decision quality and satisfaction).	Supported	No past study has examined the impact of trusting belief on consumer' perceived decision effort and decision quality. But a number of experimental studies in the OPR context (Benbasat & Wang, 2005; Benlian et al., 2012; Kim et al., 2008, 2009; Komiak & Benbasat, 2006; Pavlou, 2003; Qiu & Benbasat, 2009) have reported that customer's trust in OPR has important direct or indirect impact (via satisfaction) on their adoption intention. However, this study further revalidated the findings of these studies regarding the impact of trust on satisfaction in Amazon context. Additionally, the current findings also validated the extended impact of trust on decision effort and decision quality.
		H6: Perceived enjoyment has positive influence on consumer' perceived OPR performance (reduced decision effort, and increased decision quality and satisfaction).	Supported	The current results are consistent with the findings of the experimental study conducted by Xu et al. (2014), who found that perceived enjoyment significantly influence the perceived decision effort and decision quality. Moreover, the result regarding the significant positive relationship between perceived enjoyment and satisfaction is also consistent with the findings of different studies conducted in e-commerce (Griffith et al., 2001), online product presentation (Jiang & Benbasat, 2007b), mobile Internet service (Thong et al., 2006), and web portal usage (Kang et al., 2009). Revalidation in the context of OPR further confirmed the robustness in its affect mechanism between perceived enjoyment and satisfaction. Additionally, this study also validated the impact of perceived enjoyment on decision effort and decision quality from adoption to post-adoption stage.

6.2. Discussion on Research Results

6.2.1. Consumers' Perceived OPR Performance and OPR Continuous Usage Intention

The important findings of this study are the identification of impact factors derived from OPR usage. The OPR usage helps consumers to reduce the decision effort exerted in order to arrive at a satisfactory decision making. It enabled consumers to have easier access to a list of alternatives and related explanatory product information, which improve their decision quality meanwhile conserving the decision effort. The literature content analysis revealed that the primary objectives of consumers to use OPR are to reduce cognitive effort while searching and evaluating the products, and to enhance their decision quality in choosing a product that fit their needs. In addition to that, end user satisfaction is also identified as a key factor for continue using the service in general and particularly in IS context. Consequently, this study identified three impact factors; decision effort, decision quality, and overall customer satisfaction, derived from OPR usage. For empirical investigation, this study used them as surrogate measures of OPR performance for predicting the consumers' OPR continuous usage intention. The study results provide empirical evidence concerning the significant impact of OPR performance on consumers' OPR continuous usage intention. The finding highlighted the fact that consumers' perception of higher OPR performance in terms of reduced decision effort, improved decision quality, and satisfaction, is a salient determinant that influences their intention to continue using OPR for future buying. Contradictorily, if customers perceive that OPR do not facilitate in improving decision quality, they would more likely discontinue using OPR in future. Additionally, if the customers perceive that OPR usage requires extra effort for searching and screening products, with all other things being equal, they would

prefer to rely on their own capabilities rather than relying on OPR in order to make a final choice. Similarly, if consumers are dissatisfied or their enthusiasm is diminished after the initial OPR usage, then they would decrease the subsequent OPR use or may be discontinue using OPR. However, the results indicated that consumers' perceived decision effort, decision quality, and satisfaction representing OPR performance are direct determinants of OPR continuous usage intention and indirect measure of actual OPR continuous usage behaviours.

Consistent with the findings of Sheng et al. (2014), literature content analysis revealed that majority of empirical studies are experimental and have focused on initial adoption by using intention to reuse OPR construct (e.g. Benlian et al., 2012; Xu et al., 2014) or intention to adopt/accept OPR construct (e.g. Huang et al., 2013) as dependent constructs. Additionally, a number of conceptual (e.g. Xiao & Benbasat, 2007) and experimental studies (e.g. Häubl & Trifts, 2000; Hostler et al., 2005; Wang & Benbasat, 2009; Xu et al., 2014) have also highlighted the notion that customers would most likely continue using OPR, if they are satisfied with OPR usage following the result of their expectation-confirmation regarding reduced decision effort and improved decision quality. For example, Xu et al. (2014) conducted laboratory experiment and found that decision effort and decision quality are statistically significant determinants of consumers intention to reuse OPR for future buying. Xiao and Benbasat (2007) made proposition that decision outcomes and satisfaction have relationship with consumers' intention for future OPR use. Although no prior empirical study that examines the impact of OPR performance in terms of decision effort, decision quality, and satisfaction on consumers' OPR continuous usage intention was made, this study was able to successfully test the relationship between OPR performance and consumers' OPR continuous usage intention. The relationship was found to be significant. Therefore, this study provides new empirical evidence on OPR

performance representing decision effort, decision quality, and satisfaction which are directly related to consumers' OPR continuous usage intention. Furthermore, the satisfaction-continuous usage intention link has been extensively validated in various IS contexts such as web portal usage (Kang et al., 2009), mobile data service (Kim, 2010), mobile Internet services (Thong et al., 2006), and e-learning (Lee, 2010)]. Hence, its revalidation in the context of OPR further confirmed the robustness of the satisfaction-continuous usage intention relationship.

In this study, it was argued that OPR facilitates the online consumers in screening, evaluating and arriving at a choice decision that best fits their desire. The quality of OPR leads to consumers exerting less cognitive effort and improving buying decision. As a result, consumers' perception of OPR performance will influence their intention to continue use OPR for future buying. If consumers perceive that products recommended by OPR do not best match their needs/preferences or OPRs are no longer effective in conserving their decision effort, then with all other things being equal, then they would prefer to rely on their own capabilities rather than relying on the OPRs in order to make a final choice.

Moreover, since OPR services are evolving rapidly, customers have to constantly update their perception of decision effort in making satisfactory buying decision. Additionally, as the usability concern is linked to perceptions of cognitive effort required using OPR (Huang et al., 2013; Xu et al., 2014), it is plausible that the perceived decision effort has significant negative impact on customers' OPR continuous usage intention. The significant impact of perceived decision effort on customers' intention in the post-acceptance stage deserves further attention from researchers. This study's result implies that if the product selection task a customer went through is frustrating, complex, and

required extra effort, similarly if a technology of interest inherently requires its users to undergo a long, complex, continuous learning process, and required extra effort, then perceived decision effort may not remain as a least important factor affecting users' intention to IS continuous usage. The prior IS acceptance literature implicitly assumes that the technology of interest does not change or evolve over time in terms of its features and usage contexts. However, many technology-based services (e.g. OPR, mobile services) do keep evolving and changing, and users of such technologies need to update their expectations by interacting them. Hence, depending on the nature of a technology, users may have to go through a continuous learning process to use the technology; and thus perceived decision effort can exert influence on user behaviour for an extended period of time. Furthermore, perceived decision quality and perceived decision effort are cognitive beliefs, at the initial or pre-acceptance stage, it may potentially be unrealistic, uncertain, and inaccurate. At later or post-acceptance stage, customers usually change their expectations after using the OPR. The results of this study also extend the findings of TAM based studies (e.g. Benlian et al., 2012; Davis, 1989; Taylor & Todd, 1995) and effort-accuracy model based studies (e.g. Häubl & Trifts, 2000; Xu et al., 2014) that the perceived decision effort, perceived decision quality, and satisfaction are also salient predictors of consumers' continuous usage intention. Hence, they are critical over both initial stage and post-adoption stage of OPR usage. The following section presents discussion of the findings related to the impact of evaluation factors on OPR performance.

6.2.3. Relationship between OPR Evaluation Factors and Perceived OPR Performance

Based on the literature content analysis and expert panel's suggestion, five evaluation factors representing instrumental (i.e. perceived ease of use and perceived usefulness),

social-psychological (i.e. perceived confirmation and trust), and affective (i.e. perceived enjoyment) beliefs of the consumers were identified and included in the research model. Accordingly, this study empirically tested the impact of five OPR evaluation factors (ease of use, usefulness, confirmation, trust, and enjoyment) on consumers' perceived OPR performance. The results revealed that all five evaluation factors positively influence the OPR performance, except perceived ease of use. The result further revealed that perceived usefulness ($\beta = 0.413$, $p<0.001$) is the strongest determinant of OPR performance, followed by trusting belief ($\beta = 0.276$, $p<0.001$), perceived confirmation ($\beta = 0.198$, $p<0.001$), and perceived enjoyment ($\beta = 0.154$, $p<0.001$). These OPR evaluation factors together explained 79.2% variance in OPR performance. The findings of this study confirmed the saliency of perceived usefulness in influencing OPR performance, which is consistent with the findings of the past studies (Bhattacherjee, 2001b; Davis, 1989; Karahanna et al., 1999; Thong et al., 2006) that perceived usefulness consistently influence the attitude over both adoption and post-adoption stages. Furthermore, significant results from the effects of other post-adoption evaluation factors (trust and enjoyment) have also confirmed the need to broaden the scope of post-adoption expectations depending on the nature of IS examined and further validate the argument of Kwon and Zmud (1987) to take into account the contextual impact in IS adoption research. The results are further discussed in comparison to past studies.

6.2.3.1. Perceived Ease of Use and OPR Performance

The findings of this study indicated that perceived ease of use is not significantly related to OPR performance. Although there was no prior empirical evidence on the influence of perceived ease of use on OPR performance in the context of online recommendations, this study empirically tested this relationship. The relationship was found to be

insignificant. As this study used OPR performance as formative construct consisting of three dimensions such as perceived decision effort, perceived decision quality, and satisfaction, this study also tested the unidimensional model and found that perceived ease of use has significant negative effect on perceived decision effort. With regards to its effect on perceived decision quality and satisfaction is not empirically supported. The possible reason may be that the ease of using OPR leads to exertion of lower decision effort, but not necessarily to enhance the buying decision quality and satisfaction. In other words, although the ease of using OPR reduces the complexity and cognitive effort in customer's product selection task, but the decision taken to buy a particular product does not necessarily ensures that it fulfil his or her needs and eventually feel satisfied with it. Consequently, the consumer perception of ease on using OPR is not a significant determinant of OPR performance.

The finding of this relationship supports the argument of Bhattacherjee (2001b) for not including the perceived ease of use in IS continuance model. Bhattacherjee (2001b) argued based on the observation of Karahanna et al. (1999) that "*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' job performance*" (p. 200). Empirical studies (Bhattacherjee, 2001b; Davis, 1989; Karahanna et al., 1999) comparing the relative impacts of perceived usefulness and perceived ease of use during pre-adoption and post-adoption stages of IS use reported that in contrast to usefulness, 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. In contrast to that finding, the results of this study contradict with the findings of the studies by Thong et al. (2006) and Lee (2010), who found that perceived ease of use as an IS evaluation factor play significant role in the continuous usage of the target technology. Therefore,

the current result reaffirms the findings of Karahanna et al. (1999) and contradicts with findings of Thong et al. (2006) and Lee (2010) regarding the saliency of perceived ease of use. The distinction between the previous studies and this study lies in the operationalization of OPR performance construct. This study operationalized the perceived OPR performance as multidimensional construct that is represented by its three dimensions: decision effort, decision quality and satisfaction. However, consistent with the argument of Karahanna et al. (1999) and Bhattacherjee (2001b), the impact of perceived ease of using OPR is subsided and becomes insignificant in post-adoption stage.

6.2.3.2. Perceived Usefulness and OPR Performance

The findings of this study provide evidence on the significant impact of perceived usefulness on OPR performance. However, it is obvious that perceived usefulness is a critical factor in information systems in general and online systems in particular. In the context of online buying, it is important for the online customers to perceive the usefulness of OPR for facilitating their product evaluation and arriving at the product choice that fits their needs. The product recommender systems generate recommendations from a massive set of alternatives available on e-commerce sites by providing a concise set of related products which is more likely to match their needs. This concise set also consists of explanatory information related to recommended products, which assists consumer to evaluate the products in detail. Consequently, OPR enables the consumers to cope with the overwhelming information burden, and increase their ability and effectiveness in making satisfying buying decision (Benlian et al., 2012; Komiak & Benbasat, 2006). Therefore, OPR's usefulness plays an important role in predicting decision effort, decision quality, and satisfaction with OPR. If consumers perceive that

OPR is useful in terms of product evaluation and choice selection, then perceived usefulness will positively affect OPR performance in terms of reduced decision effort, improved decision quality and satisfaction.

The findings of this study are supported by some scholars (Benlian et al., 2012; Häubl & Trifts, 2000; Seo et al., 2013; Xu et al., 2014) who regards the perceived usefulness as positive belief in the OPR's characteristics, information, and product diagnosticity. For example, Xu et al. (2014) conducted an experimental study on online recommendation and found that perceived product diagnosticity had negative impact on perceived decision effort and positive significant impact on perceived decision quality. The current results also supported the findings of Vessey and Galletta (1991) by indicating that if there is a good fit between the task (i.e. online buying) and the incoming information (i.e. OPR) for product evaluation, then it leads to increased buying decision accuracy and less decision effort. In contrast to that, if customers perceive that OPR is not useful in terms of product evaluation, then it will result in greater cognitive effort and lesser decision accuracy in making buying decision. Furthermore, the current findings are also consistent with the argument of Bhattacherjee, (2001) and Thong et al., (2006) which asserts that perceived usefulness is the most salient predicting factor in IS context due to its consistent significant impact on attitude over both initial and post-adoption stages. Several IS past studies have also found the significant impact of perceived usefulness on satisfaction in different IS post-adoption context such as mobile Internet service (Thong et al., 2006), e-learning (Islam, 2012; Lee, 2010), web portal usage (Kang et al., 2009), mobile data service (Kim, 2010), and e-commerce service (Bhattacherjee, 2001a). Therefore, the current result revalidated the findings of the above mentioned past studies. The distinction between the previous studies and this study lies in the operationalization of OPR performance construct. This study operationalized the perceived OPR performance as

multidimensional construct that is represented by three dimensions: decision effort, decision quality and satisfaction. Whereas, past studies operationalized the performance as one construct with multi-items. For example, satisfaction with multi-items, has been used as the most recommended surrogate measure of performance in past IS literature (e.g. Aladwani, 2002; Ives, Olson, & Baroudi, 1983; Sharabati, 2014).

6.2.3.3 Perceived Confirmation and OPR Performance

The findings of this study supports the relationship between perceived confirmation and OPR performance. Although no empirical evidence was found regarding the influence of perceived confirmation on OPR performance in this study context. This study empirically tested this relationship. The relationship was found to be significant. The impact of expectation-confirmation is originally explained in the ECT based studies (Lin et al., 2005; Oliver, 1980, 1981; Oliver & DeSarbo, 1988; Prakash, 1984; Swan & Trawick, 1981), where satisfaction is separately influenced by expectation and confirmation after actual use of IS. These studies explained that users' expectations serve as a base for the users' confirmation in order to determine their satisfaction level. Later, Bhattacherjee (2001b) found that users' perceived confirmation positively influences the perceived usefulness. Similarly, Thong et al. (2006) and Lee (2010) found that perceived confirmation had significant positive effects on perceived ease of use, perceived usefulness, perceived enjoyment, and satisfaction. The main argument in these studies was that initial expectations are adjusted by confirmation experience, especially when users' expectations are not concrete due to the uncertainty over what to expect from the IS usage. In the context of OPR, it implies that a customer's initial expectation may change after experiencing OPR, and the revised expectation-confirmation plays an important role in determining OPR performance with respect to decision effort, decision

quality, and satisfaction. Hence, the current results further revalidate and extend the findings of above mentioned studies that the perceived confirmation is a significant predictor of decision effort, decision quality, and satisfaction, indicating that perceived confirmation still do contribute substantially in predicting satisfaction along with decision effort and decision quality.

Moreover in the context of OPR, various past studies (Komiak & Benbasat, 2006; Wang & Benbasat, 2004; West et al., 1999; Xiao & Benbasat, 2007) have also conceptually highlighted the importance of considering and managing customers' expectations in the design of OPR. For example, Xiao and Benbasat (2007) developed a proposition that consumers might stop using OPR, when OPR do not fulfil their expectations of making better buying decision with reduced decision effort. Likewise, Komiak et al. (2005); and Wang and Benbasat (2004) reported that consumers often got disappointed with online recommendations due to their expectation-disconfirmation in broadening their horizon of product knowledge and effective buying decision. Consequently, this study empirically tested the impact of perceived confirmation on OPR performance in terms of decision effort, decision quality, and satisfaction. Additionally, this results also revalidated the positive relationships between perceived confirmation and satisfaction, found by various past IS studies conducted in different context such as mobile Internet service (Thong et al., 2006), e-learning (Islam, 2012; Lee, 2010), web portal usage (Kang et al., 2009), mobile data service (Kim, 2010), and e-commerce service (Bhattacherjee, 2001a). Furthermore, this study also extended their findings by empirically testing the impact of perceived confirmation on additional factors; decision effort and decision quality. The current findings confirmed the need to broaden the effect mechanisms of perceived confirmation depending on the nature of IS examined and further validated the argument of Kwon and Zmud (1987) to take into account the impact of study context in IS research.

6.2.3.4. Trusting Belief and OPR Performance

The findings of this study provided evidence that consumers' trusting belief in OPR is positively related to OPR performance. Although no empirical study was found on the relationship between customers' trusting belief and OPR performance, this study empirically tested this relationship. The relationship is found to be positively significant. The current finding supports the argument of past studies (Kim et al., 2009; Xiao & Benbasat, 2007) that trusting belief is an important determinant in the success of online business due to customers' uncertainty about buying decision. This uncertainty arises because of online customers' inability to touch, feel, and experience the product before actual buying. Consequently, the OPR reduces customers' uncertainty by providing an explanatory information for product evaluation. Moreover, customers have more control over interaction with recommender system for specifying and skipping their preferences for required product attributes and expressing their degree of confidence in the recommendations, which results in greater trust with OPR. Additionally, consumer reviews and product ratings are also provided in order to build customers' trust on OPR, which results in ease of mind with the use of OPR. Consequently, the current finding implies that customers trust in OPR is developed and adjusted over a period of time by positive or negative experiences with OPR's use. Positive experience of OPR causes higher trust, indicating that the recommender system has the ability to recommend required products, which minimizes customers' effort in searching and evaluating alternatives as well as arriving at best buying decision. Conversely, if customers' experience is negative with OPR, then they would perceive that OPR's use will not conserve their decision effort and improve decision quality. Therefore, it is necessary for OPR to be considered trustworthy that it must be in customers' best interest and free from deceptive manipulations. Otherwise, customers' trust in OPR diminishes over a period of

time and they would stop relying on them due to low OPR performance in terms of greater decision effort exerted, lower buying decision quality, and dissatisfaction with OPR. Hence, this finding indicates that in voluntary usage context, it is crucial to enhance and leverage on customers' trust in order to achieve an acceptable OPR performance.

This study tested the impact of trust on multidimensional OPR performance construct. The current finding is consistent and confirms the prior findings in terms of significant relationship between trust and satisfaction, but no prior studies empirically examined the impact of consumers' trusting belief on perceived decision effort and perceived decision quality. Consequently, the findings of this study extend prior findings by broadening the impact mechanisms of trust. Past experimental studies in the context of OPR (Benbasat & Wang, 2005; Benlian et al., 2012; Kim et al., 2008, 2009; Komiak & Benbasat, 2006; Pavlou, 2003; Qiu & Benbasat, 2009) have reported that customer's trust in e-commerce vendors and OPR has important direct or indirect (e.g. via perceived usefulness, perceived risk, satisfaction) influence on their adoption intention. In e-commerce context, Balasubramanian et al. (2003) found that perceived trustworthiness is a vital element in creating satisfied and loyal customers. Likewise, Kim, et al., (2009) found that trust has an indirect impact on customer's e-loyalty through satisfaction. Furthermore, several other past studies demonstrated that customers trusting belief has impact on satisfaction in different IS context such as online investment (Balasubramanian et al., 2003), web portal usage (Coker, 2013), internet banking (Hoehle, Huff, & Goode, 2012; Omar & Ali, 2010), and online retailers (Wagner & Rydstrom, 2001). The current finding can further be supported with Festinger's cognitive dissonance theory (Festinger, 1962), which elaborates the relationship between customer trust and satisfaction while striving for harmony in their perception, values, and beliefs, and asserted that satisfaction is likely to be higher, when trust is higher, and lower when trust is lower. However, this study further

revalidated the findings of these prior studies regarding the impact of trust on satisfaction in the context of OPR. Additionally, current findings also validated the impact of trust on decision effort and decision quality.

6.2.3.5. Perceived Enjoyment and OPR Performance

The findings of this study provide empirical evidence on the relationship between perceived enjoyment and OPR performance. This finding is confirmed by the argument of prior IS studies (e.g. Kamis et al., 2008; Koufaris, 2002; Van der Heijden, 2004; Xu et al., 2014; Xu et al., 2013) that perceived enjoyment as an important affective belief in its affect mechanism. For example, Xu et al. (2014) reported that perceived enjoyment can effectively capture users' task- and mood-relevant cues. Kamis et al. (2008) found that perceived enjoyment is an affective reaction of users, when using an online decision support system (DSS). The OPR has features such as pictorial presentations of the products, product ratings, and narrative of customers' personal experiences of product usage that provide stimuli in core affects of the customers, which subsequently influence their perception of OPR performance. The rationale is that when customers are in a state of pleasant feeling and greater enjoyment with the use of OPR, they will more actively process the information provided (Griffith et al., 2001). This active processing of OPR provides information that leads to greater likelihood of choosing a high quality product alternative and consequently experiencing greater satisfaction with the OPR use. Conversely, with less enjoyment, customers may process the information more passively, which may hinder their decision of selecting a low quality product alternative and subsequently resulting in lower satisfaction with the use of OPR.

The current result is consistent and confirms the findings of the experimental study conducted by Xu et al. (2014), who found that perceived enjoyment negatively influences the perceived decision effort and positively affect the perceived decision quality. They argued based on the past finding by Agarwal & Karahanna (2000) that a customer is less able to notice the passing of time while in a state of deep involvement and interaction with the recommender system. Consequently, this results in decreased decision effort due to underestimating the difficulty associated with the use of recommender system based on its interesting and appealing features. In other words, customers' perception of higher enjoyment leads to ignoring the difficulty associated with OPR's use, which motivates them to make effective buying decision without realizing the level of decision effort exerted. Conversely, if customers perceive OPR as unpleasant, dissatisfying, repulsive, and boring, it results in greater perceived decision effort and lower decision accuracy, and subsequently lower satisfaction. Furthermore, the current finding regarding significant positive relationship between perceived enjoyment and satisfaction is also consistent with the findings of different studies conducted in e-commerce (Griffith et al., 2001), online product presentation (Jiang & Benbasat, 2007b), mobile Internet service (Thong et al., 2006), and web portal usage (Kang et al., 2009). Revalidation in the context of OPR further confirmed the robustness in its affect mechanism between perceived enjoyment and satisfaction. Additionally, this study also validated the impact of perceived enjoyment on decision effort and decision quality. However, the findings of this study proved that perceived enjoyment plays significant role in predicting OPR's performance in terms of decision effort, decision quality, and satisfaction.

After presenting and discussing the findings of this study, the following section details the study implications for research, methodology, and practice.

6.3. Implications of the Study

The findings of this study have implications on both theory and practice. The following sections present theoretical and practical contributions to the extant literature.

6.3.1. Implications for Theory

The findings of this study has a number of implications for theory as follows: ***First,*** this study contributes the knowledge by integrating the four theoretical models; IS continuance model, effort-accuracy model, trust formation theory, and flow theory, for assessing consumers' OPR continuous usage intention. These theories have been independently and extensively used to examine online interactions in various past studies (e.g. Fasolo et al., 2005; Häubl et al., 2004; Häubl & Murray, 2003; Häubl & Trifts, 2000; Hostler et al., 2005; Schafer et al., 2002; Xiao & Benbasat, 2007; Xu et al., 2014). However, combining these theories have collectively provided more comprehensive understanding of the cognitive processes and behaviours related to OPR continuous usage than when each theory is considered alone. This approach is likely to ensure a stable theory development.

Second, contribution is the development and validation of the proposed research model. Six hypotheses based on the model were developed and empirically tested. All hypotheses were found statistically significant, except one. Additionally, the results showed that the model had good explanatory power (*GoF*=75.6%) in predicting consumers' OPR continuous usage intention. Additionally, the integrated research model offers theoretical lens to understand customers' perception on OPR performance in terms of decision effort, decision quality, and satisfaction, resulting from a state of changes in various evaluation

beliefs in contrast to those studies conducted to examine the direct impact of recommender system on decision effort and decision quality (e.g. Häubl et al., 2004; Häubl & Trifts, 2000).

Third, researches examining OPR initial acceptance is fairly recent (Benlian et al. 2012; Sheng et al., 2014; Sheng & Zolfagharian, 2014; Xu et al., 2014). However, based on literature reviews, no prior research has been done to help understand OPR continuous usage that is an even more pressing issue because continuous usage has been shown a driving force to usage commitment and long-term success of new technologies (Jasperson et al., 2005; Rogers, 2010). Therefore, this study investigated the post-adoption factors that determine the consumers' OPR continuous usage intention. The results showed that consumers' OPR evaluation beliefs significantly influence OPR performance which, in turn, determine their OPR continuous usage intention. This study used decision effort, decision quality, and satisfaction as surrogate measure of OPR performance that directly influence consumers' OPR continuous usage intention. This study found that these three factors of OPR performance play the role of driving force to OPR usage commitment and long-term success of recommender system. The OPR performance factors also help to understand the acceptance–discontinuous usage anomaly phenomenon in the context of OPR post-adoption. Consequently, the findings of this study contributed to the extant literature of IS post-adoption in general and of OPR post-adoption in particular.

Fourth, in literature, a little consideration is shown towards the relationship between OPR evaluation factors and OPR performance. Majority of prior studies (e.g. Benlian et al., 2012; Huang et al., 2013; Komiak & Benbasat, 2006) investigated the direct impact of OPR evaluation factors on consumers' intention to accept OPR. Less attention has been paid to investigate the impact of OPR evaluation factors on OPR performance. Based on

literature content analysis, one study was found experimentally examining the impact of perceived enjoyment and perceived product diagnosticity on OPR performance factors; perceived decision effort and perceived decision quality (Xu et al., 2014). The current findings revalidated these relationships in real consumers' environment of Amazon. Additionally, this study also confirmed the impact of three other evaluation factors (ease of use, confirmation, and trust) on OPR performance. Consequently, the current study successfully investigated the impact of five evaluation factors representing three categories of consumers' beliefs such as instrumental (ease of use and usefulness), social-psychological (confirmation and trust), and affective (enjoyment) beliefs on OPR performance. However, the findings of this study help to bridge the existing gaps in the OPR literature.

Fifth, mostly prior studies have been conducted using laboratory experimental approach, less studies have focused on real consumer environment and were thus unable to explore how decision makers actually obtain information and use it in decision making process (Zha et al., 2013). Consequently, this study provided empirical evidences on the relationship between study variables by collecting primary data from real users of OPR in the context of Amazon customers. The results explained how various OPR evaluation factors influence consumer's perception of OPR performance which, in turn, determine their intention to continue using OPR for future buying. Therefore, this study contributed to the literature by exploring how real Amazon customers perceive online recommendations and use them in their online buying decision making.

Finally, the current findings support Benbasat and Zmud (2003)'s call to take into account the unique characteristics of IS innovation in adoption literature. This study incorporated the variables related to consumers' OPR evaluation beliefs and OPR

performance, which emphasize usability and performance in making satisfying decision. In order to verify the generalizability of the current findings to other Decision Support Systems (DSS), further research into the utility of the integrated research model on different types of DSS will be beneficial. Another opportunity for further research is the continuous development in enhancing the research model. This research avenue bears much promise in assisting IS researchers to understand why users continue or discontinue usage of a target system.

6.3.2. Implications for Methodology

The current study follows a positivist paradigm and quantitative deductive approach to investigate consumers' OPR continuous usage intention as a form of human behavioural response and one of the social realities, which can be objectively examined by employing standard scientific methods.

The current study has significant methodological implications for trusting belief and OPR performance constructs. This study operationalizes trusting belief and OPR performance as a second-order formative constructs based on systematic decision rules (see Chapter 4, section 4.2.1). The systematic decision rules facilitate the identification of the nature of construct measurement. For example, in contrast to the study by Benlian et al. (2012), it proves that the three dimensions; competence trust, benevolence trust, and integrity trust represent and define the trusting belief construct. In addition to that, it also proves that perceived decision effort, perceived decision quality, and satisfaction represent and define the OPR performance construct. This is contrary to prior studies (e.g. Griffiths et al., 2007; Häubl & Murray, 2006; Häubl & Trifts, 2000; Xu et al., 2014) that investigated OPR performance by considering each dimension separately as a first-order reflective

construct and were focused on recognizing individual items. It is important to identify the nature of dimensions and/or items of the construct. Edwards and Bagozzi (2000) emphasized that the misidentification of the reflective and formative constructs may lead to type I and type II errors. Consequently, it might negatively influence the theory advancement due to generating inappropriate outcomes. For this reason, the relationships between the constructs and their measurement items need to be viewed as hypotheses which require assessment along with structural paths (Edwards & Bagozzi, 2000). However, the operationalization of trusting belief and OPR performance as a second-order formative constructs makes this study analysis and findings unique.

6.3.3. Implications for Practice

In addition to the theoretical and methodological contributions, this study also provides a number of implications to the practice.

First, the significant and dominant impacts of perceived decision effort, perceived decision quality, and satisfaction present e-retailers (e.g. Amazon) with potential fruitful areas to affect OPR continuous usage. A major objective for the e-retailers should be to formulate strategies that will enhance consumers' perception of improved decision quality and satisfaction with the use of OPR. Furthermore, they should also manage consumers' expectations on the system in reducing cognitive effort and improving buying decision quality. As a result, consumers will continue using OPR for their making future buying decision. Meanwhile, these satisfied customers can provide an effective channel to bring in new customers through word-of-mouth promotions about the buying decision aid provided by the OPR.

Second, the study results imply that depending on the nature of IS, especially consumer-oriented IS that serves various goals, the IS service providers are suggested to pay careful attention to the usability and performance-aspects of the IS innovation. As more IS innovations that can be considered as consumer decision aids become available, the role that decision effort, decision quality and satisfaction play in determining their success in the marketplace will become increasingly important. Further, consistent with prior IS adoption literature, this study emphasizes that e-retailers should not neglect in developing strategies that will help customers to reduce decision effort and improve buying decision quality because consumers' perceptions of lower cognitive effort, higher decision quality, and overall satisfaction with IS usage can ultimately encourage users to continue using the target system. From this perspective, IS practitioners should pay more attention in designing IS that is more useful in terms of decision quality which require less cognitive effort for making satisfying decision.

Third, the current findings provide guidance to managers who want to design sales-efficient e-commerce websites that improve overall shopping experience of the online consumers. The managers may benefit from the current finding by emphasizing product relevant OPR along with the purchasing funnel that explains consumer-product interaction process into following four steps: awareness, consideration, purchase, and loyalty. Based on their strategic orientation regarding product categories (e.g. search versus experience), customer segments (e.g. younger versus older), and channels (e.g. Internet versus mobile), e-retailers should examine which types of consumer reaction is the most favourable to increase customer satisfaction and subsequently to increase sales. Accordingly, e-retailers may adjust the provision of system recommendations and consumer reviews on their e-commerce websites. It may be an effective approach to design OPR which provide customers with a comprehensive buying experience by

considering their cognitive and affective effects including trust and enjoyment. However, this study provides practical implications to the e-retailers for recommendation-based-product marketing strategies and the designing sales-efficient e-commerce websites that enhance customers' overall shopping experience.

Finally, using this study's insight, alternate website design can be tested to better determine at which stage of purchasing funnel, consumer reviews should be more or less emphasized in OPR while recommending products to customers. The current findings on the significant effect of product type indicated that providing appropriate consumer reviews with OPR that matches product type (search or experience) can allow customers to develop consistent mental representation which results in greater OPR usefulness, trustworthiness, and enjoyment. Consequently, consumers perceive the OPR to be more effective in improving the efficiency of buying decision making. Moreover, consumers may increase their online buying based on OPR and continue using OPR for future buying. However, at a more practical level, this study provides practitioners with insights into how to address consumers' continued usage behaviour and a guideline to employ OPR mechanisms in a more appropriate way.

In line with previous discussion, it is plausible that paying attention to consumers' OPR evaluation beliefs will positively affect their perception of OPR performance, and subsequently leverage OPR's continued use.

6.4. Study Limitations and Future Research

In addition to the study contributions, there are a few limitations to this study, which will be discussed together with recommendations for future research. These limitations and future research suggestions are discussed as follows: ***First,*** the research model of this

study empirically provides evidence of the influence of evaluation factors on OPR performance, which in turn determines OPR continuous usage intention. Consumers' OPR continuous usage intention is investigated in Amazon context via online survey. The respondents of the online survey were Amazon customers from 15 different countries, majority of the respondents were from Italy, France, Germany, USA and UK, which have a unique cultural environment different from developing countries. It is plausible that developing countries are different from developed countries in terms of administrative, political, social, cultural, and economic characteristics including the nature of economy, the level of technology usage, and the quality of human resources (Palekar, 2012). These differences may have significant impact on the results of the research model. Additionally, several past studies (e.g. Kiani, Laroche, & Paulin, 2016; Münch & Smelser, 1992) have found the moderating impact of culture. To improve the generalizability of the current findings, the replication of research model in developing countries or in the context other than Amazon (e.g. eBay) will undoubtedly contribute to the generalizability of the study findings. It is also believed that future research can also be conducted in the context of less well-known e-commerce platforms which would be useful to generalize the current findings. In addition to that, performing comparative studies between different contexts (e.g. Amazon vs eBay) will enhance the understanding of the contextual differences.

***Second*,** this study investigates and tests the impact of five OPR evaluation factors on OPR performance, which in turn determine the OPR continuous usage intention. However, this study did not test the relationship among five evaluation factors. Consequently, future research may examine the relationship between them and their direct impact on consumers' OPR continuous usage intention. Additionally, consistent with past studies (Benlian et al., 2010, 2012; Komiak & Benbasat, 2006), this study found

that after perceived usefulness, trust is the second strongest determinant of OPR performance. Moreover, various e-commerce specialists and industrial report (Chu, 2013; Srihari, 2015; MacKenzie, Meyer, & Noble, 2013) highlighted that Amazon generates up to 35% of sales from OPR, indicating relatively low usage rate considering the fact that consumers' have not yet developed ongoing trust on OPR. Therefore, it is recommended that future research should emphasize justifying and testing the mediating impact of trusting belief on the relationship between evaluation factors and OPR performance factors (e.g. satisfaction). This investigation may add another breadth to the study context.

Finally, this study is designed under quantitative deductive and cross-sectional time horizon that was found to be suitable for testing the research model. However, future researches can adopt longitudinal design that can be used to test and investigate OPR continuous usage. It is believed that longitudinal study may help to better understand the temporal and causal relationships among the study variables in different periods of time. If the purpose is to examine whether pre-adoption expectations actually change after confirmation of experiences, then a longitudinal design is recommended that would give a clearer picture of how the users' perceptions and the relationships among variables change over time. OPR evaluation constructs can be investigated in two different period of time to test the impact of the progress and the improvement of OPR evaluation constructs, and their impact on OPR performance and OPR continuous usage intention. For example, one can investigate consumers' perception before using OPR, during initial OPR usage, and after OPR usage when product has been received and used. As the study's objective was to determine the utility of integrated research model [assuming pre-adoption expectations do change after confirmation of experiences which is already confirmed by Bhattacherjee and Premkumar (2004)], so a cross-sectional design was suitable for this study.

6.5. Conclusion

The main aim of this study is to investigate the impact of consumers' OPR evaluation beliefs on their perception of OPR performance, which subsequently determines their OPR continuous usage intention in voluntary use environment. In consonance with the research objectives, two research questions of this study were posed: **First,** how does the consumers' perception of OPR performance influences their behavioural intention towards OPR continuous usage? **Second,** what are the OPR evaluation factors that have influence on consumers' perception of OPR performance? This study postulates that appropriate OPR evaluation factors, as perceived by OPR users, have influence on the OPR performance, which in turn determine the OPR continuous usage intention.

Four theoretical models; IS continuance model, effort-accuracy model, theory of trust formation, and flow theory, were adopted and integrated to describe the causal linkages between the determinants of OPR performance and consumers' OPR continuous usage intention. This study specifies four issues. **First,** to identify the factors that can be used as surrogate measure of OPR performance in terms of OPR usage outcomes. **Second,** to identify the factors that measure the consumers' OPR evaluation beliefs in terms of their instrumental, social-psychological, and affective beliefs. **Third,** to ascertain how consumers' perception of OPR performance influences their behavioural intention towards OPR continuous usage. **Fourth,** to examine the impact of OPR evaluation factors on consumers' perception of OPR performance. The first issue identified five evaluation factors related to three dimensions of consumers beliefs; instrumental (ease of use and usefulness), social-psychological (confirmation and trust), and affective (enjoyment) beliefs. Second issue identified the three factors (decision effort, decision quality, and satisfaction) related to OPR performance in terms of OPR usage outcomes. The first two

variables (decision effort and decision quality) are from effort-accuracy model and last variable (satisfaction) is from IS continuance model. Third issue investigated the impact of consumers' evaluation beliefs on their perception of OPR performance. The decision effort, decision quality, and satisfaction are seen the key factors that influence the consumers' behavioural response toward OPR usage. Fourth issue examined how the consumers' perceived OPR performance determined their OPR continuous usage intention. Consequently, six main hypotheses were developed and tested.

In order to test the hypotheses, this study uses quantitative approach which is consistent with the positivist paradigm. A questionnaire that reflects the proposed research constructs is developed to collect the primary data for the study. The data was collected from 626 Amazon customers, who have used OPR for making buying decision. Since, this study is quantitative with a deductive approach, it employs partial least squares-structural equation modelling (PLS-SEM) to validate and confirm research model by testing the relationships being hypothesized.

The findings of this study provide empirical evidence for the significant impact of consumers' evaluation beliefs on OPR performance. The PLS results showed that all evaluation factors (ease of use, usefulness, confirmation, trust, and enjoyment) have statistically significant impact on OPR performance, except perceived ease of use. Furthermore, the study findings approve the influence of OPR performance on consumers' OPR continuous usage intention for future buying. It indicated that consumers' perception of decision effort, decision quality, and satisfaction representing OPR performance are direct predictors of OPR continuous usage intention.

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APPENDIX A: Research Survey Questionnaire Set

A-1: Cover Letter Respondents

Dear Amazon Customer,

My name is Muhammad Ashraf. I am a PhD candidate from the Business and Accountancy Faculty, University of Malaya under the supervision of Professor Dr. Ainin Sulaiman and Associate Professor Dr. Noor Ismawati Jaafar. As part of my degree fulfilment, I am required to conduct an empirical research entitled **"Antecedents of Online Product Recommendation Continuous Usage Intention"** For that purpose, I have designed a survey questionnaire to collect the required data. The findings of this study will be useful for designing, managing, and improving the continuous usage of online recommendation. I would like to invite you to be a part of this research study by sharing your valuable experience and opinion about the use of online recommendation.

Please note that all information provided in this survey is **STRICTLY CONFIDENTIAL** and will only be used for the purpose of this research. Your response will be used in an aggregate form and **at no time your response will be identified in any report**. Your participation is **completely voluntary**. The link to the surveymonkey is provided below. As compensation for your time, I can offer you a copy of our research findings, expected to be complete in March, 2016. There is an area on the form to provide a contact email if you wish to receive it.

If you have any question about this research, please contact me at muhammadashraf@siswa.um.edu.my or my supervisors: Prof. Dr. Ainin Sulaiman (ainins@um.edu.my) and Associate Prof. Dr. Noor Ismawati Jaafar (isma_jaafar@um.edu.my). You can find them in the University directory at http://umexpert.um.edu.my/ainins.

Thank you very much for your time and feedback.

Sincerely,

Muhammad Ashraf,
MBA, MS, Ph.D Candidate,
Faculty of Business and Accountancy,
University of Malaya, Kuala Lumpur, Malaysia

A-2: Sample Survey of Instrument

Section 1: Please answer the following questions related to your personal experience with Internet usage and online buying.

1. How many years have you been using the Internet?

☐ Less than 1 year
☐ 1–2 years
☐ 2–3 years
☐ 3–4 years
☐ 4–5 years
☐ 5–6 years
☐ 6–7 years
☐ More than 7 years

2. Approximately, how long have you been buying online?

☐ Less than 1 year
☐ 1–2 years
☐ 2–3 years
☐ 3–4 years
☐ 4–5 years
☐ More than 5 years

Section 2: We would like to seek your knowledge about **Online Product Recommendation** (hereafter it is called **OPR**). This study stated that OPR originate from system recommendation and consumer review. System recommendation is the recommendation generated by Internet-based software which providing shopping advice to customers based on their past buying behavior or their specified preferences, or the preferences of other like-minded customers. Whereas, consumer review is post-consumption opinion of the consumers which provide assistance to potential customers to buy a particular product or not. Here, OPR refers to system generated recommendation which contains consumer reviews. Please answer following questions keeping in view of OPR.

3. Have you used OPR for buying product(s) online over last six months?

☐ Yes
☐ No

4. Please, specify the product(s) that you have purchased online RECENTLY over last six months.

☐ Laptop
☐ Digital Camera
☐ Cell Phone
☐ Home Electronics
☐ Software
☐ Clothing/Shoes
☐ Movie/Music CDs
☐ Books/Magazines
☐ Others, (please specify)_____

5. Please rate your ability to Judge the performance of the products

	Not all						Very Well
a. Before purchase	1	2	3	4	5	6	7
b. After purchase	1	2	3	4	5	6	7

6. How many product(s) have you bought online over the last six month?

☐ 1–5
☐ 6–10
☐ 11–15
☐ 16–20
☐ More than 20

7. How much money did you spend on online buying over the last six months?

☐ Less than $100
☐ $100–$200
☐ $201–$300
☐ $301–$400
☐ $401–$500
☐ More than $500

8. Approximately, how long have you been using the OPR for online buying?

☐ Less than 6 months
☐ 6 months to < 1 year
☐ 1-2 years
☐ 2-3 years
☐ 3-4 years
☐ 4-5 years
☐ More than 5 years

9. In general, how would you rate your level of expertise with using the OPR: *(Please circle the most appropriate number)*

			Intermediate			
Basic	1	2	3	4	5	**Advanced**

10. How likely are you to use the OPR when you intend to buy online in the future?

		Unlikely	Neutral	Likely		
No, Definitely Not	1	2	3	4	5	**Yes,** Definitely

Section 3: Please state your experiences about using the OPR in online buying decision process. Please answer all the questions in this section keeping in view the product(s) that you have specified in the previous section 2.

11. The OPR was	Strongly Disagree		Neutral		Strongly Agree
a. Competent in recommending the required product.	1	2	3	4	5
b. Effect in recommending the required product.	1	2	3	4	5
c. Expert to recommend product according to my preference.	1	2	3	4	5

12. I believe that OPR's dealings with me	Strongly Disagree		Neutral		Strongly Agree
a. Were in my best interest.	1	2	3	4	5
b. Felt like it would do its best to help me.	1	2	3	4	5
c. To find a best product.	1	2	3	4	5

13. I believe that OPR is	Strongly Disagree		Neutral		Strongly Agree
a. Truthful.	1	2	3	4	5
b. Honest.	1	2	3	4	5
c. Unbiased.	1	2	3	4	5
d. Sincere and Genuine	1	2	3	4	5

14. Using OPR for online buying was	Strongly Disagree		Neutral		Strongly Agree
a. Enjoyment.	1	2	3	4	5
b. Pleasurable.	1	2	3	4	5
c. Pleasant.	1	2	3	4	5
d. Entertaining.	1	2	3	4	5
e. Fun.	1	2	3	4	5

15. To make an accurate purchase judgment, understanding OPR was:

	Strongly Disagree		Neutral		Strongly Agree
a. Easy for me.	1	2	3	4	5
b. Understandable.	1	2	3	4	5
c. Clear and simple	1	2	3	4	5
d. Required less effort	1	2	3	4	5
e. Required less time.	1	2	3	4	5

16. Using OPR

	Strongly Disagree		Neutral		Strongly Agree
a. Enables me to evaluate the product.	1	2	3	4	5
b. Assisted me to understand the performance of the product.	1	2	3	4	5
c. Allowed me to accomplish more analysis than would otherwise be difficult..	1	2	3	4	5
d. Was Helpful in familiarizing me with the product.	1	2	3	4	5
e. Enhanced my effectiveness in assessing the product.	1	2	3	4	5

17. When using the OPR

	Strongly Disagree		Neutral		Strongly Agree
a. My experience was better than what I expected.	1	2	3	4	5
b. The service level provided was better than what I expected.	1	2	3	4	5
c. Overall, most of my expectations were confirmed.	1	2	3	4	5

18. The product recommended by OPR, it

	Strongly Disagree		Neutral		Strongly Agree
a. Suited my preferences.	1	2	3	4	5
b. Best matched my needs.	1	2	3	4	5
c. Best choice to buy.	1	2	3	4	5
d. Helped me to avoid poor choice.	1	2	3	4	5
e. Helped me to make best decision possible.	1	2	3	4	5

19. Using OPR, the product selection task that I went to through

	Strongly Disagree		Neutral		Strongly Agree
a. Was frustrating.	1	2	3	4	5
b. Was complex.	1	2	3	4	5
c. Required a lot of effort.	1	2	3	4	5

d.	Took much time.	1	2	3	4	5

Following statements in **Q. 20** are related to your **satisfaction** with using the OPR. Five point semantic differential scale ranging from negative towards positive feeling is used to measure the level of satisfaction with the OPR usage. For example, **from 1 for very Unsatisfactory (i.e. strongly negative feeling) towards 5 for very Satisfactory (i.e. strongly positive feeling).** It is shown as follow:

20. My overall experience of using the OPR was

a.	Very dissatisfied	1	2	3	4	5	Very satisfied.
b.	Very displeased	1	2	3	4	5	Very pleased.
c.	Very frustrated	1	2	3	4	5	Very contended.
d.	Absolutely terrible	1	2	3	4	5	absolutely delighted.

21. If you need to buy a product in future, how likely is it that you would

		Very Unlikely		Neutral		Very Likely
a.	Intend to continue using OPR in the future.	1	2	3	4	5
b.	Predict your use of OPR in the future.	1	2	3	4	5
c.	Plan to continue using OPR in the future.	1	2	3	4	5
d.	Continue to pay attention to OPR in the future.	1	2	3	4	5

Section 4: In this section, please answer the following questions related to your personal information.

22. What is your gender?

☐ Male
☐ Female

23. What is your age group?

☐ Less than 20 years
☐ 20-25 years
☐ 26-35 years
☐ 36-45 years
☐ 46-55 years
☐ Over 55 years

24. What is your marital status?

- ☐ Single
- ☐ Married
- ☐ Widowed
- ☐ Divorced
- ☐ Other (*please specify*, e.g. separated)_____

25. What is your highest level of education?

- ☐ Certificate
- ☐ Diploma
- ☐ Bachelor Degree
- ☐ Master Degree
- ☐ Doctorate/Ph.D
- ☐ Others (*please specify*)_____

26. What is your occupation?

- ☐ Private Employed
- ☐ Government Employed
- ☐ Self-employed
- ☐ Unemployed
- ☐ Student
- ☐ Retiree
- ☐ Other (Please specify)_____

27. What is your monthly income?

- ☐ Under $1, 000
- ☐ $1,001–$2,000
- ☐ $2,001–$3,000
- ☐ $3,001–$4,000
- ☐ $4,001–$5,000
- ☐ Over $5,000
- ☐ No Income
- ☐ Do not want to disclose

28. What is your geographic location?

- ☐ USA
- ☐ UK
- ☐ Brazil
- ☐ Canada
- ☐ China
- ☐ France
- ☐ Germany
- ☐ India
- ☐ Ireland
- ☐ Italy
- ☐ Japan
- ☐ Mexico
- ☐ Netherlands
- ☐ Spain
- ☐ Other (please specify)

29. If you want to receive the results of the research, please specify your email

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APPENDIX B: Systematic Review of OPR Literature

Past researches on online product recommendation (OPR) have reported the influence of different factors on OPR effectiveness. Given the purpose of this study, it is important to gain understanding of these underlying determinants of OPR effectiveness over three stages of OPR adoption (i.e. pre-usage, initial usage, and continuous usage). However, the researcher draws on social communication framework (Hovland, 1948; Cheung & Thadani, 2010) and three-stage adoption process theory (Looney et al., 2008; Meuter et al., 2005; Rogers, 2003) as guiding theories to conduct a systematic review of OPR literature in order to identify factors influencing OPR effectiveness across the three stages of OPR adoption. The researcher adopted the "Five Steps Grounded Theory Literature Review Method" (Wolfswinkel et al., 2013), to systematically review prior OPR literature, which is presented in this Appendix. Objective of literature review is to identify and synthesize the factors that influence OPR effectiveness on consumers' perceptions of using OPR across three stages of the adoption process (i.e. pre-usage, initial usage, and continuous usage). In this Appendix, firstly we present a theoretical framework for synthesizing the extant OPR literature. Secondly, based on the five stages of "Grounded Theory Literature Review Method" (Wolfswinkel et al. 2013), literature review methodology is outlined for analysing the extant OPR literature. Finally, output of the literature review in terms of classification of the factors that can influence OPR effectiveness across its three stages of adoption process (i.e. pre-usage, initial usage, and continuous usage).

Theoretical Foundation

OPR is considered as important form of social influence which influence consumers' adoption of services over the three stage adoption process (i.e. pre-use, initial-use, and repeated use) (Bock et al., 2012; Qahri Saremi, 2014). According to Qahri Saremi (2014), social influence refers the extent to which members of a social network influence one another's behaviour. Social influence is exerted through messages which assist consumers to form perceptions of the value of the services, at each stage of adoption process (Montazemi & Qahri Saremi, 2013; Qahri Saremi, 2014). Adoption of a service is not a one-time decision, it is a process that occurs over time and consists of a series of actions and decisions over a number of stages (Rogers, 2010; Xia & Lee, 2000). Qahri Saremi (2014, p.82) reported the contention of Webster and Watson (2002) that "*authors of literature reviews are at risk for producing mind numbing lists of citations and findings that resemble a phone book–impressive case, lots of numbers, but not much plot*". In contrast to that, a systematic review arises only from a coherent conceptual structuring of the topic itself. A guiding theory is required for systematic reviews (Qahri Saremi, 2014). However, the researcher draws on social communication framework (Hovland, 1948; Cheung & Thadani, 2010) and three-stage adoption process theory (Looney et al., 2008; Meuter et al., 2005; Rogers, 2003) as guiding theories to conduct a systematic review of OPR literature in order to identify factors influencing to OPR effectiveness across the three stages of OPR adoption process. Social communication is defined as "the process by which an individual (the communicator) transmits stimuli to modify the behaviour of other individuals (receivers)" (Hovland, 1948, p. 371). The OPR is a new form of communication between a receiver and a sender, which comprises four major dimensions

of OPR effectiveness that are depicted in Figure B1: (1) the communicator (OPR provider- source) who transmits the OPR, (2) the OPR transmitted in the form of social communication (OPR stimulus), (3) the consumer as a receiver who receives and responds to OPR (OPR receiver), and (4) the responses made to OPR by the receiver. The researcher systematically reviewed OPR literature in order to identify factors pertaining to each dimension of OPR across the three stage adoption process.

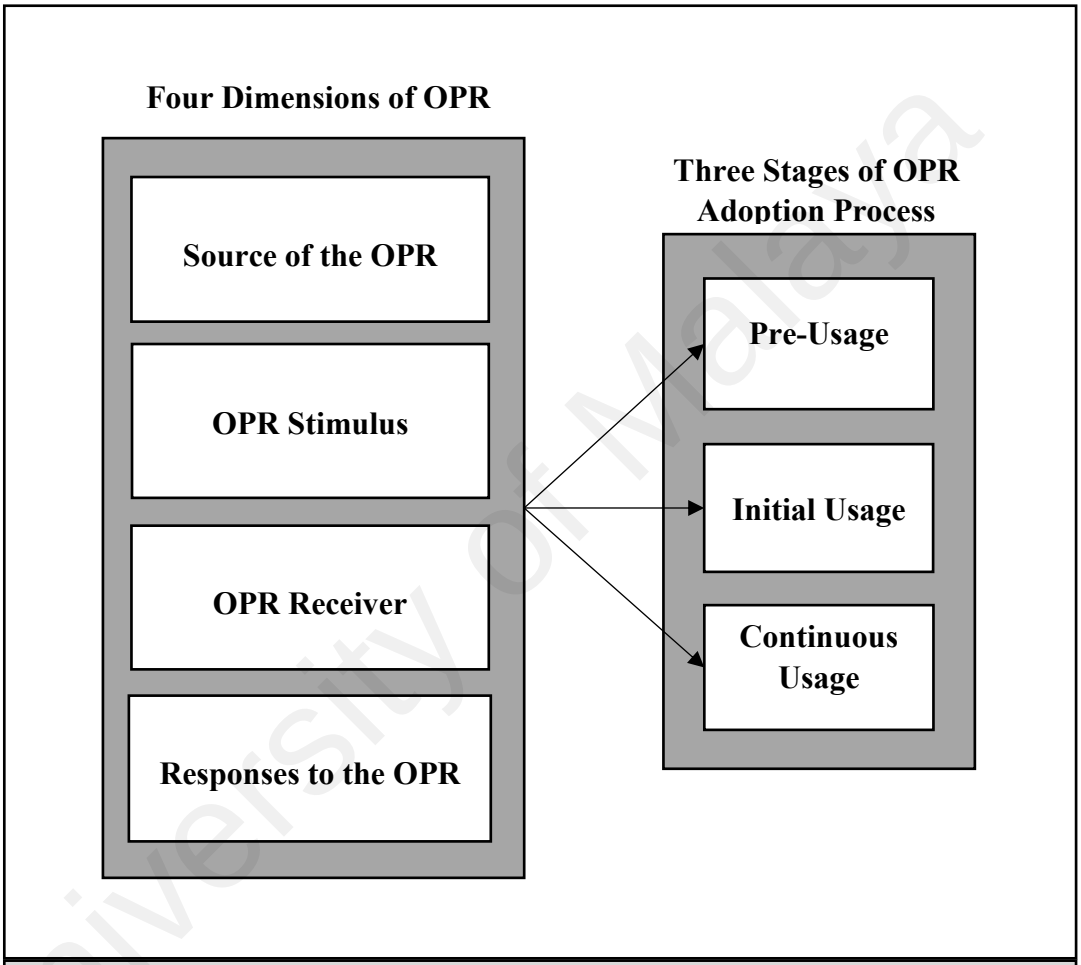


Figure B1: Conceptual Framework of OPR Adoption

Methodology

The researcher adopted the "Grounded Theory Literature Review Method" (Wolfswinkel et al., 2013) to systematically review prior OPR literature published from 2000 to 2015. This method assisted to systematically and thoroughly analyse OPR literature by following five steps, shown in Figure B2. Step 1 (Define) consists of defining the inclusion/exclusion criteria, determining databases for searching literature, and determining the appropriate search terms. In step 2 (Search), the actual search for the

published studies is conducted using the keywords and the databases determined in the step 1. Step 3 (Select) consist of refining the retrieved OPR studies from step 2 based on the inclusion/exclusion criteria that were determined in step 1. In step 4 (Analyse), the researcher synthesizes the refined sample of OPR studies using Grounded Theory techniques: open coding, axial coding, and selective coding. Finally, in step 5 (Present), the researcher presents the findings and insights gathered from the synthesis of the OPR studies in step 4. A detailed explanation of each step is presented in the following sections.

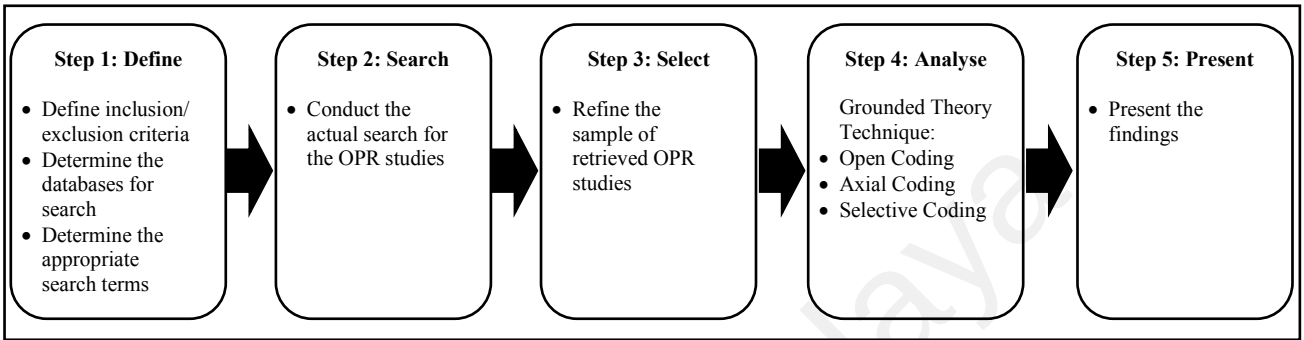


Figure B2: Grounded Theory Literature Review Method
Source: Wolfswinkel et al. (2013)

Steps 1 - 3: Define, Search, and Select

To identify journal and conference papers that investigated the consumers' perception of OPR usage in making online buying decision, the researcher searched a number of electronic databases such as Science Direct, Web of Sciences, Emerald, JSTOR, EBSCOhost, ABI/INFORM @ Proquest, Springer Link, AIS e-library, and Google Scholar. Key words such as "online product recommendation", "online recommendation", "product recommendation", system recommendation", "system generated product recommendation", 'user generated recommendations", "online consumer reviews", "electronic word of mouth", and "eWOM recommendation" were used to search relevant articles. In order increase the coverage of relevant articles, several combinations of the key words were also used. For example; "system recommendation and online customer reviews", "product/service recommendation and consumer reviews", "product/service recommendation and electronic word of mouth", and "recommendations and eWOM". To ensure that no major relevant article is ignored, the researcher also searched leading scholarly Information System journals (i.e. MIS Quarterly, Journal of Management Information Systems, Decision Support System, Information Systems Research, European Journal of Information Systems, Computer in Human Behavior, International Journal of Electronic Commerce, Information Systems Journal, Journal of Association for Information Systems, and Information & Management), and a few other major Marketing journals (Journal of Marketing, Journal of Marketing Research, Journal of Interactive Marketing, and Journal of Consumer Research). Furthermore, backword and forward searches were also performed in searching articles.

In order to identify the factors pertaining to four dimensions of OPR effectiveness, the searches on OPR produced 391 articles in total. Following the guidelines of the systematic review methodology, inclusion and exclusion criteria were applied to the 391 articles. The criteria were followed to ensure that the articles selected for further analysis are appropriate for the purpose of literature review. The researcher specified five inclusions

criteria as follow: (1) article must be academic and peer reviewed in nature; (2) online recommendation should be the major focus of examination in the article; (3) researchers had a defined sample; (4) articles that addressed the effect of OPR; (5) article dealt with individual-level examination of OPR in business-to-consumer settings. The exclusion criteria were applied to: (1) articles with an entirely conceptual or theoretical and no research design; (2) article dealt with Market-Level examination of OPR. After applying 5 inclusion and 2 exclusion criteria applied to 391 articles, 251 articles were excluded from the analysis and remaining 140 articles that were included for further analysis, as shown in Tables B1 to B4.

Step 4: Analyse

To analyse the selected 140 OPR studies, variables used in these studies were initially identified and coded. Next, these variables were synthesized into factors based on their conceptual similarities and mapped them on four dimensions of OPR: OPR source, OPR stimulus, OPR receiver, and response to OPR. It is done using three grounded theory techniques: (1) open coding, (2) axial coding, and (3) selective coding. The researcher used 'open coding' technique, through which variables, their measurements, and their stage of study (i.e. pre-usage, initial usage, or re-usage/continuous usage) were coded for each of the 140 OPR studies. It resulted into 423 variables that were used in the 140 OPR studies. Next, the researcher applied 'axial coding' technique, to synthesize these 423 variables based on their conceptual similarities. For this, the researcher focus on variable measurements that were used in the respective OPR study. Based on comparative analysis between the measurements of 423 variables yielded 54 conceptually distinct factors. Finally, 'selective coding' technique was applied to map these 54 factors on the four dimensions of OPR over three stages. For selective coding, the researcher used 1 for pre-usage, 2 for initial usage, and 3 for continuous usage to map the factors, depicted in Figure B3.

Results (Step 5: Present)

Content analyses of 140 OPR studies revealed 54 conceptually distinct factors representing four dimensions of OPR: (1) four factors pertaining to source of OPR, as detailed in Table B1; (2) Twelve factors pertaining to OPR stimulus representing two dimension, as shown in Table B2; (3) eleven factors pertaining to OPR receiver, as depicted in Table B3; and (4) twenty seven factors pertaining to receiver's response to OPR, as explained in Table B4. Past OPR literature showed that these 54 factors influence the OPR effectiveness in terms of consumers' perceptions towards OPR usage (i.e. pre-usage, initial usage, and continuous usage).

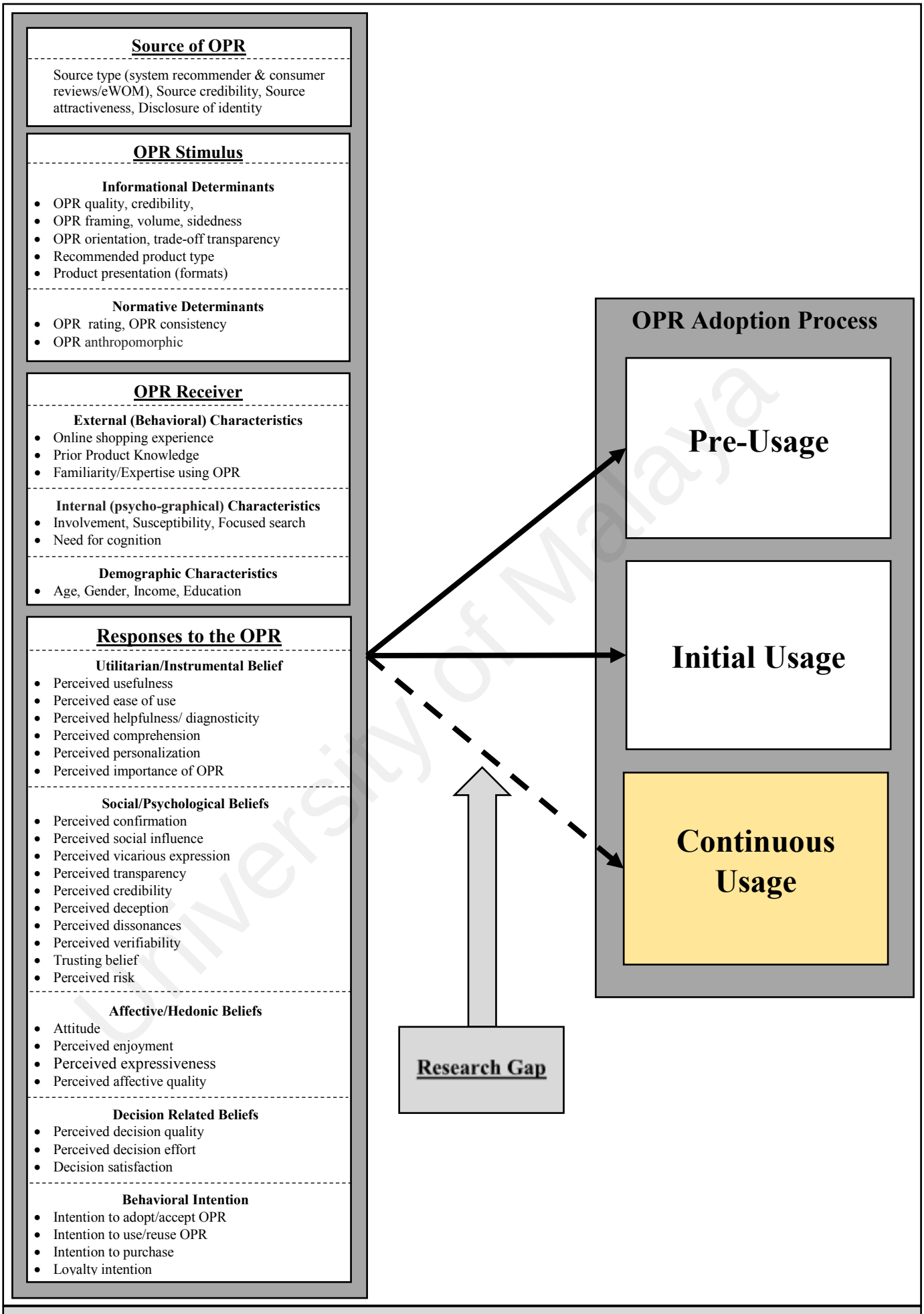


Figure B3: The 54 Factors Representing Four Dimensions of OPR Effectiveness over Three Stages of Adoption Process

Table B1. Factors Pertaining to Source of OPR

Sr. No.	Constructs	Definition	Three Stage Adoption Process in OPR Studies		
			Pre-adoption (Pre-usage)	**Adoption** (Initial usage/re-use intention)	**Post-adoption** (Continuous usage)
1	OPR source/type	OPR generated from system recommender and consumer reviews (Benlian, Titah, & Hess, 2010, 2012)	(Huang & Chen, 2006; Lee, Shi, Cheung, Lim, & Sia, 2011; Wang & Benbasat, 2004; Wang & Benbasat, 2004)	(Baum & Spann, 2014; Benlian et al., 2012; Goh, Heng, & Lin, 2013; Kumar & Benbasat, 2006; Senecal & Nantel, 2004; Sinha & Swearingen, 2002; Wang, 2005)	(Chen, Wu, & Yoon, 2004; Nakayama, Wan, & Sutcliffe, 2010)
2	OPR source creditability (expertise and trustworthiness)	OPR source's perceived ability (Expertise) or motivation to provide accurate and truthful information (Trustworthiness) (Cheung & Thadani, 2012)	(Chu & Kim, 2011; Huang & Chen, 2006; Huang & Yang, 2011; Park & Lee, 2009a)	(Benlian et al., 2012; Cheung, Luo, SIA, & Chen, 2007; Cheung et al., 2009; Jensen et al., 2013; Li, Huang, Tan, & Wei, 2013; Luo, Zhang, Liu, & Li, 2015; Martin & Lueg, 2013; Rabjohn, Cheung, & Lee, 2008; Smith, Menon, & Sivakumar, 2005; Tseng & Hsu, 2010; Vermeulen & Seegers, 2009; Zhang & Watts, 2008)	(Cheung, Lee, & Rabjohn, 2008; M. Cheung et al., 2012; Cheung et al., 2007, 2009)
3	OPR source attractiveness	Attractiveness encompasses similarity, familiarity and likability and reflects the extent to which the consumers identifies with the source (Cheung & Thadani, 2012)		(Bollen et al., 2010; Häubl & Murray, 2003, 2006; Qiu & Benbasat, 2009)	
4	Disclosure of identity	The disclosure of one's identity (i.e. OPR source) to others (i.e. consumers) (Cheung & Thadani, 2012; Forman, Ghose, & Wiesenfeld, 2008; Racherla & Friske, 2012)	(Racherla & Friske, 2012)	(Kusumasondjaja, Shanka, & Marchegiani, 2012; Willemsen et al., 2011)	(Forman et al., 2008)

Table B2. Factor Pertaining to OPR Stimulus

Sr. No.	Constructs	Definition	Three Stage Adoption Process in OPR Studies		
			Pre-adoption (Pre-usage)	**Adoption** (Initial/re-use intention)	**Post-adoption** (Continuous usage)
1	OPR quality: (Timeliness, Understand-ability, Relevance, Accuracy, Value-Added, Completeness)	The OPR quality refers to the persuasive strength of arguments/ recommendation embedded in OPR (Wang & Strong, 1996): - Timeliness concerns whether the OPR is current, timely, and up-to-date. - Understand-ability refers to readability, interpretability, and ease of understanding, as well as language, semantic, and lexical expressions used by OPR. - Relevance refers to the extent to which OPR is applicable and helpful for a task at hand. - Accuracy concerns reliability of the OPR. It also represents a user's perception that the OPR is correct. - Value-added is the extent to which information is beneficial and provides advantages from their use. - Completeness is defined as the extent to which information is of sufficient breadth, depth, and scope for the task at hand. - Extent to which OPR elaborate product attributes (Chua & Banerjee, 2014)	(Huang & Yang, 2011; Jumin Lee et al., 2008; Park & Lee, 2009b; Park et al., 2007; Racherla & Friske, 2012; Zhao & Xie, 2011)	(Bharati & Chaudhury, 2004; Cheung et al., 2008; Cheung et al., 2007, 2009; Choi & Scott, 2013; Gupta & Harris, 2010; Lin et al., 2011; Luo et al., 2015; Martin & Lueg, 2013; Ozturkcan & Gursoy, 2014; Rabjohn et al., 2008; Reisen & Hoffrage, 2010; Shi, Tan, & Sia, 2013; Sinha & Swearingen, 2002; Tseng & Hsu, 2010; Wang & Benbasat, 2009; Yoon et al., 2013; Zhang, Craciun, & Shin, 2010; Zhang & Watts, 2008)	(Awad & Ragowsky, 2008; Cao, Duan, & Gan, 2011; Cheung et al., 2008; Cheung et al., 2012; Cheung et al., 2007, 2009; Chua & Banerjee, 2014; Filieri & McLeay, 2014; Ghose & Ipeirotis, 2011; Luo, Luo, Schatzberg, & Sia, 2013; Mudambi & Schuff, 2010; Rabjohn et al., 2008; Tsai & Chuang, 2011)
2	OPR Quantity/volume	The extent to which the quantity or volume of available data is appropriate for a specific task (Wang & Strong, 1996)	(Park et al., 2007)	(Schindler & Bickart, 2012)	(Filieri & McLeay, 2014)

3	Recommended Product Type	Search vs Experience attributes of the focal product/service in OPR (Benlian et al., 2010, 2012).	(Pan & Chiou, 2011; Park & Lee, 2009a; Senecal & Nantel, 2004; Xia & Bechwati, 2008)	(Benlian, Titah, & Hess, 2012; Aggarwal & Vaidyanathan, 2003; Baum & Spann, 2014; Choi, Lee, & Kim, 2011; Huang, Tan, Ke, & Wei, 2013; Huang, Tan, & Wei, 2013; Sen & Lerman, 2007; Senecal & Nantel, 2004)	(Baek, Ahn, & Choi, 2012; Chen et al., 2004; Chua & Banerjee, 2014; Mudambi & Schuff, 2010; Nakayama et al., 2010; Román, 2010; Siering & Muntermann, 2013; Willemsen et al., 2011)
4	Recommended Product Rating	Rating refers to numerical information comprising from 1 to 5 point scale based on past consumers evaluation of the products (Duan, Gu, & Whinston, 2008)	(Vermeulen & Seegers, 2009)		(Awad & Ragowsky, 2008; Cheung et al., 2007, 2009; Chua & Banerjee, 2014; Forman et al., 2008; Mudambi & Schuff, 2010; Siering & Muntermann, 2013)
5	OPR sidedness	A one-sided OPR presents either the positive or negative arguments, but not both. A two-sided OPR includes both positive and negative arguments (Cheung & Thadani, 2012)	(Floh, Koller, & Zauner, 2013; Jung Lee & Lee, 2009; M. Lee, Rodgers, & Kim, 2009; Racherla & Friske, 2012; Yao, Fang, Dineen, & Yao, 2009)	(Baum & Spann, 2014; Jensen et al., 2013; Schindler & Bickart, 2012)	(Cheung et al., 2012; Cheung et al., 2007, 2009)
6	OPR consistency	The OPR congruence to others' opinions about the focal service (Cheung & Thadani, 2012)	(Qiu, Pang, & Lim, 2012; Yao et al., 2009)	(Baum & Spann, 2014)	(Cheung et al., 2012; Cheung et al., 2007, 2009)
7	OPR Framing	The valence of OPR shows that whether it is positive or negative (Cheung & Thadani, 2012).	(Chakravarty et al., 2010; Chu & Kim, 2011; Floh et al., 2013; Huang & Chen, 2006; Huang & Yang, 2011; Jones, Aiken, & Boush, 2009; Lee et al., 2009; Lee & Youn, 2009; Pan & Chiou, 2011; C. Park & Lee, 2009a; Qiu et al., 2012; Sparks & Browning, 2011; Vermeulen & Seegers, 2009; Xia & Bechwati, 2008)	(Baum & Spann, 2014; Cheung et al., 2009; Kusumasondjaja et al., 2012; Schindler & Bickart, 2012; Sen & Lerman, 2007; Vermeulen & Seegers, 2009; Zhang et al., 2010; Zou et al., 2011)	(Cheung et al., 2007, 2009; Huang, Hsiao, & Chen, 2012; Willemsen et al., 2011)
8	OPR orientation	Attribute-centric versus simple OPR (Cheung & Thadani, 2012; Park & Kim, 2009)	(Park & Lee, 2009b; Park & Kim, 2009; Xia & Bechwati, 2008)		

9	OPR trade-off transparency	Trade-off relationships among attributes of the products (Xu, Benbasat, & Cenfetelli, 2014)	(Wang & Benbasat, 2007)	(Cramer et al., 2008; Kramer, 2007; Wang, 2005; Xu et al., 2014)	
10	Anthropomorphic	Humanoid embodiment and voice output (Qiu & Benbasat, 2009)		(Qiu & Benbasat, 2009)	
11	Product presentation format	Product presentation formats: static pictures, videos without narration, videos with narration, and virtual product experience (Jiang & Benbasat, 2007)		(Jiang & Benbasat, 2007)	
12	OPR credibility	Believable, true, or factual recommendation (Cheung et al., 2009)		(Doh & Hwang, 2009)	(Cheung et al., 2012; Luo et al., 2013)

Table B3. Factors Pertaining to OPR Receiver

Sr. No.	Constructs	Definition	Three Stage Adoption Process in OPR Studies		
			Pre-adoption (Pre-usage)	**Adoption** (Initial usage/re-use intention)	**Post-adoption** (Continuous usage)
1	Receiver's level of expertise	Consumers' level of expertise is an external behavioral characteristic refers to - Consumers' online buying experience - average times for Internet shopping per month (Park & Lee, 2009a). - Consumers' prior knowledge of products (Yoon, Hostler, Guo, & Guimaraes, 2013) - Consumers' prior experience, knowledge, or familiarity with OPR (Cheung & Thadani, 2012; Martin & Lueg, 2013)	(Vermeulen & Seegers, 2009) (Chakravarty, Liu, & Mazumdar, 2010; Cheung, Xiao, & Liu, 2012; Park & Kim, 2009; Qahri Saremi, 2014; Swaminathan, 2003; Vermeulen & Seegers, 2009)	(Bollen, Knijnenburg, Willemsen, & Graus, 2010; Cheung, Luo, Sia, & Chen, 2009; Martin & Lueg, 2013; Qahri Saremi, 2014; Swaminathan, 2003; Tseng & Hsu, 2010; Wang & Benbasat, 2007; Yoon et al., 2013; Zou, Yu, & Hao, 2011)	(Cheung, Sia, & Kuan, 2012; Liu & Zhang, 2010; Park & Lee, 2009a; Qahri Saremi, 2014; Willemsen, Neijens, Bronner, & de Ridder, 2011)
2	Receiver's involvement	The degree of psychological identification and affective, emotional ties the consumer has with OPR (Cheung & Thadani, 2012) or Consumers personal relevance to product/services (Cheung et al., 2012).	(Cheung et al., 2012; Jumin Lee, Park, & Han, 2008; Park, Lee, & Han, 2007; Racherla & Friske, 2012)	(Baum & Spann, 2014; Cheung et al., 2009; Doh & Hwang, 2009; Jensen, Averbeck, Zhang, & Wright, 2013; Martin & Lueg, 2013; W. Zhang & Watts, 2008)	(Cheung et al., 2012)
3	Receiver's susceptibility	Consumers' tendency to learn about products and services by seeking information from others- it is an internal (psycho-graphical) characteristic of the consumers (Park & Lee, 2009a).		(Wang & Benbasat, 2007)	(Park & Lee, 2009a)

4	Receiver's focused search	The extent to which consumers have specific information needs in mind during their active search for on-topic information (Zhang & Watts, 2008).		(Zhang & Watts, 2008)	
5	Receiver's need for cognition	The OPR receiver's innate desire to think about and process information (Gupta & Harris, 2010; Qahri Saremi, 2014)	(Qahri Saremi, 2014)	(Aljukhadar, Senecal, & Daoust, 2010; Gupta & Harris, 2010; Lin, Lee, & Horng, 2011; Qahri Saremi, 2014)	(Qahri Saremi, 2014)
6	Receiver's demographics	Demographical attributes of OPR' users (e.g. gender, age, education)		(Choi & Scott, 2013; Hess, Fuller, & Mathew, 2006; Xiao & Tan, 2012)	(Awad & Ragowsky, 2008; Chua & Banerjee, 2014; Román, 2010)

Table B4. Factors Pertaining to Receiver's Response to OPR

Sr. No.	Constructs	Definition	Three Stage Adoption Process in OPR Studies		
			Pre-adoption (Pre-usage)	**Adoption** (Initial usage/ reuse intention)	**Post-adoption** (Continued usage)
1	Perceived decision quality of OPR (decision effectiveness & decision accuracy)	Decision quality is defined as the extent to which the customers have decided to purchase products fit their needs or taste (Zhang et al., 2011). Decision quality is indicated by decision confidence and effectiveness.	(Swaminathan, 2003)	(Aksoy & Bloom, 2001; Aljukhadar et al., 2010; Häubl & Murray, 2006; Häubl & Trifts, 2000; Hess et al., 2006; Köhler, Breugelmans, & Dellaert, 2011; Pereira, 2001; Reisen & Hoffrage, 2010; Swaminathan, 2003; Xu et al., 2014; Zhang, Agarwal, & Lucas Jr, 2011; Gudigantala, Song, & Jones, 2011)	(Z ha, Li, & Yan, 2013)
2	Perceived decision Effort of OPR/ Effort expectancy	Decision effort refers to the amount of effort exerted by the customers in processing product information, evaluating product alternatives, and arriving at choice decision (Xiao & Benbasat, 2007).		(Bechwati & Xia, 2003; Gudigantala et al., 2011; Häubl & Murray, 2003, 2006; Hess et al., 2006; Huang, Tan, Ke, et al., 2013; Knijnenburg, Willemsen, Gantner, Soncu, & Newell, 2012; Köhler et al., 2011; Wang, 2005; Wang & Benbasat, 2009; Xu et al., 2014; Yin, Bond, & Zhang, 2014)	(Tsai & Chuang, 2011)
3	Perceived credibility of OPR	Extent to which one perceives a recommendation as believable, true, factual and Trustworthy (Cheung et al., 2009; Park & Lee, 2009; Cheung et al., 2009).	(Hsu, Chuan-Chuan Lin, & Chiang, 2013; Huang & Chen, 2006; Lee et al., 2011; Pan & Chiou, 2011; Qiu et al., 2012; Racherla & Friske, 2012)	(Casaló, Flavián, & Guinalíu, 2011; Cheung et al., 2007, 2009; Doh & Hwang, 2009; Lee & Koo, 2012; Li et al., 2013; Liao & Zhong, 2010; Luo et al., 2015 ; Ozturkcan & Gursoy, 2014; Tseng & Hsu, 2010)	(Cheung et al., 2009; Fan & Miao, 2012; Hsiao, Chuan-Chuan Lin, Wang, Lu, & Yu, 2010)

4	Trusting belief (integrity, competence, benevolence, emotional)	Consumers' trust in OPR' competence, benevolence, and integrity (Benlian et al., 2012).	(Hsu et al., 2013; Pan & Chiou, 2011; Qiu et al., 2012; Wang & Benbasat, 2004; Wang & Benbasat, 2004)	(Benbasat & Wang, 2005; Benlian et al., 2012; Casaló et al., 2011; Cheong & Morrison, 2008; Cheung & Lee, 2008; Choi et al., 2011; Choi & Scott, 2013; Cramer et al., 2008; Dabholkar & Sheng, 2012; Knijnenburg, Reijmer, & Willemsen, 2011; Knijnenburg et al., 2012; Komiak & Benbasat, 2006; Komiak & Benbasat, 2008; Kusumasondjaja et al., 2012; Liao & Zhong, 2010; Lim, Sia, Lee, & Benbasat, 2006; Qiu & Benbasat, 2009; Sameh, Benbasat, & Cenfetelli, 2010; Sia et al., 2009; Sparks & Browning, 2011; Wang, 2005; Wang & Benbasat, 2007, 2008)	(Awad & Ragowsky, 2008; Hsiao et al., 2010; Hsu et al., 2013; Liu & Zhang, 2010; Tsai & Chuang, 2011)
5	Perceived deception	An unethical act perpetrated by online companies to manipulate product information content and/or presentation so as to induce desired behavioral changes in consumer decision making – changes that may be to the detriment of the consumers (e.g. purchasing an item based on misleading representations of their characteristics made by the online retailer) (Román, 2010)		(Wang & Benbasat, 2007; Xiao & Tan, 2012)	(Román, 2010)
6	Perceived vicarious expression	Degree to which OPR convey vivid experiences of a product that could be felt by receivers (Li et al., 2013).		(Li et al., 2013)	
7	Perceived Ease-of-Use	Perceived ease of use refers the degree to which a person believes that using OPR is easy to use (Benlian et al., 2012).	(Lee et al., 2011)	(Benbasat & Wang, 2005; Cramer et al., 2008; Kowatsch & Maass, 2010; Lee, Cheung, Sia, & Lim, 2006; Reisen & Hoffrage, 2010; Sheng & Zolfagharian, 2014; Sinha & Swearingen, 2002; Tseng & Hsu, 2010; Vijayasarathy & Jones, 2001; Wang, 2005)	(Awad & Ragowsky, 2008)

8	Perceived usefulness	Perceived usefulness refers the degree to which a person believes that using OPR would enhance his or her buying decision performance (Benlian et al., 2012).	(Hsu et al., 2013; Jung Lee & Lee, 2009; Lee et al., 2011; Li & Wang, 2013; Park & Lee, 2009a; Racherla & Friske, 2012)	(Baum & Spann, 2014; Benbasat & Wang, 2005; Casaló et al., 2011; Cramer et al., 2008; Kowatsch & Maass, 2010; Kumar & Benbasat, 2006; Lee et al., 2006; Lo & Lin, 2013; Pfeiffer & Benbasat, 2012; Purnawirawan, De Pelsmacker, & Dens, 2012; Rabjohn et al., 2008; Sheng & Zolfagharian, 2014; Sinha & Swearingen, 2002; Tseng & Hsu, 2010; Wang, 2005; Xia & Bechwati, 2008)	(Awad & Ragowsky, 2008; Cheung et al., 2008; Gruen, Osmonbekov, & Czaplewski, 2006; Hsu et al., 2013; Park & Lee, 2009a; Rabjohn et al., 2008; Willemsen et al., 2011)
9	Perceived helpfulness/diagnosticity	Consumers' perception of the helpfulness of OPR (Cheung & Thadani, 2012; Sen & Lerman, 2007). As the extent to which consumers perceive the OPR as being capable of facilitating judgment or purchase decisions (Li et al., 2013) or helpful for fully evaluating a product (Jiang & Benbasat, 2007).	(Hsu et al., 2013; J. H. Huang & Chen, 2006; Park & Lee, 2009b; Park & Kim, 2009; Qiu et al., 2012; Racherla & Friske, 2012)	(Casaló et al., 2011; Cheung et al., 2008; Cheung et al., 2009; Huang, Tan, & Ke, 2011; Huang, Tan, Ke, et al., 2013; Huang, Tan, & Wei, 2013; Kim & Gupta, 2012; Li et al., 2013; Lim et al., 2006; Schindler & Bickart, 2012; Tseng & Hsu, 2010; Yin et al., 2014; Vijayasarathy & Jones, 2001; Jiang & Benbasat, 2007; Li et al., 2013; Xu et al., 2014)	(Baek et al., 2012; Cao et al., 2011; Forman et al., 2008; Ghose & Ipeirotis, 2011;Siering & Muntermann, 2013)
10	Attitude (toward OPR/product/ service)	Consumers' overall evaluations of the service (Cheung & Thadani, 2012)	(Chakravarty et al., 2010; Chu & Kim, 2011; Hsu et al., 2013; Jones et al., 2009; Jung Lee & Lee, 2009; Jumin Lee et al., 2008; Lee et al., 2009; Lee & Youn, 2009; Lee et al., 2011; Li & Wang, 2013; Pan & Chiou, 2011; Vermeulen & Seegers, 2009)	(Casaló et al., 2011; Doh & Hwang, 2009; Ku & Tai, 2013; Lee et al., 2006; Lim et al., 2006; Purnawirawan et al., 2012; Sen & Lerman, 2007; Sia et al., 2009; Vermeulen & Seegers, 2009; Zou et al., 2011)	(Hsu et al., 2013; Huang et al., 2012)
11	Satisfaction (Decision confidence, Decision effectiveness)/Satisfaction with OPR	A positive evaluation of customers' experience with OPR or online shopping (Bhattacherjee, 2001)		(Aggarwal & Vaidyanathan, 2003; Aljukhadar et al., 2010; Bechwati & Xia, 2003; Bharati & Chaudhury, 2004; Dabholkar & Sheng, 2012; Gudigantala et al., 2011; Hess et al., 2006; Y. Jiang, Shang, & Liu, 2010; Knijnenburg et al., 2011; Knijnenburg et al., 2012; McNee, Lam, Konstan, &	(Tsai & Chuang, 2011; Zha et al., 2013)

				Riedl, 2003; Pereira, 2001; Perera, 2000; Sinha & Swearingen, 2002; Yoon et al., 2013)	
12	Perceived Fit of OPR with preference/Perceived personalization/ Perceived relevance of OPR	Customer's perception of an OPR's personalization (i.e. the extent to which the OPR understands and represents his or her personal needs)(Komiak & Benbasat, 2006).	(Xia & Bechwati, 2008)	(Gretzel & Fesenmaier, 2006; Knijnenburg et al., 2012; Komiak & Benbasat, 2006; Komiak & Benbasat, 2008; Senecal & Nantel, 2004)	
13	Perceived comprehension	perceptual assessment of the amount of cognitive resources expended on OPR comprehension (Huang, Tan, Ke, et al., 2013)		(Huang et al., 2011; Huang, Tan, Ke, et al., 2013)	
14	Perceived enjoyment	Perceived enjoyment refers to the extent to which consumers' interaction with OPR is perceived to be enjoyable in its own right aside from the utilitarian value of the OPR (Davis, Bagozzi, & Warshaw, 1992)		(Gretzel & Fesenmaier, 2006; Lee et al., 2006; Qiu & Benbasat, 2009; Sheng & Zolfagharian, 2014; Tseng & Hsu, 2010; Xu et al., 2014; Baum & Spann, 2014; Vijayasarathy & Jones, 2001)	
15	Perceived affective quality	An individual's affective reactions to using service (Benlian et al., 2010, 2012).	(Xia & Bechwati, 2008)	(Benlian et al., 2012; Sameh et al., 2010)	
16	Perceived dissonances	Inconsistency between OPR and consumers' preferences (Pfeiffer & Benbasat, 2012).		(Pfeiffer & Benbasat, 2012)	
17	Perceived expectation-confirmation/Performance expectancy,	Customers' perception of congruence between expectation of OPR use and its actual performance (Cheung &Thadani, 2012; Cheung et al., 2009; Bhattacherjee (2001b).		(Zhang & Watts, 2008)	(Cheung et al., 2007, 2009; Serenko & Stach, 2009)
18	Perceived social influence (subjective norm)	Informational social influence and normative social influence: Informational social influence is defined as "influence to accept information obtained from another as evidence about reality," and normative social influence is defined as the "influence to conform to the expectations of another person or group" (Deutsch & Gerard, 1955; Ku & Tai, 2013).		(Choi & Scott, 2013; Ku & Tai, 2013)	(Awad & Ragowsky, 2008; Oechslein, Fleischmann, & Hess, 2014)

19	Perceived Importance of OPR	Consumers believe that information contained in OPR is important and necessary for them to make their purchase decisions (Liu & Zhang, 2010). It refers to quality and value of OPR.		(Aggarwal & Vaidyanathan, 2003) (Gretzel & Fesenmaier, 2006)	(Liu & Zhang, 2010; Nakayama et al., 2010)
20	Perceived risk	Consumer's belief about the potential uncertain negative outcomes from the online transaction (Kim, Ferrin, & Rao, 2008)	(Swaminathan, 2003)	(Dabholkar & Sheng, 2012; Liao & Zhong, 2010)	
21	Perceived verifiability of OPR	The extent to which consumers perceive that the appropriateness of a PRA's product recommendations can be determined (Xiao & Tan, 2006)		(Xiao & Tan, 2012)	
22	Perceived expressiveness	Users' perceptions of the extent to which a virtual advisor conveys human-like emotions and feelings in its communication with users (Sameh et al., 2010).		(Sameh et al., 2010)	
23	Perceived transparency	Consumers' ability to 'see through' the IDA's process and helps in seeing a correspondence between the preference elicitation and the recommendation stage (Köhler et al., 2011). Or The extent to which the user understands why a certain recommendation is offered.		(Cramer et al., 2008; Köhler et al., 2011; Sameh et al., 2010; Xu et al., 2014)	
24	Extent of Elaboration	Consumers' extent of cognitive elaborations about the OPR (Cheung & Thadani, 2012; Chu & Kamal, 2008).	(Chu & Kim, 2011)	(Wang & Benbasat, 2007)	

25	Intention to adopt/accept/use OPR	Consumer's intention to accept/adopt or use OPR (Huang, Tan, Ke, et al., 2013)	(Xia & Bechwati, 2008; Yao et al., 2009)	(Aggarwal & Vaidyanathan, 2003; Baum & Spann, 2014; Benbasat & Wang, 2005; Casaló et al., 2011; Gupta & Harris, 2010; Huang, Tan, Ke, et al., 2013; Köhler et al., 2011; S. Komiak & Benbasat, 2006; Kowatsch & Maass, 2010; Pfeiffer & Benbasat, 2012; Senecal & Nantel, 2004; Wang, 2005; Wang & Benbasat, 2009; Yao et al., 2009; Zou et al., 2011)	(Awad & Ragowsky, 2008; Oechslein et al., 2014)
26	Intention to reuse OPR	Consumers' willingness to reuse OPR (Benlian et al., 2012).		(Benlian et al., 2012; Choi et al., 2011; Lee et al., 2006; Liao & Zhong, 2010; Purnawirawan et al., 2012; Qiu & Benbasat, 2009; Sameh et al., 2010; Sheng & Zolfagharian, 2014; Xu et al., 2014)	
27	OPR adoption/acceptance	A process in which consumers purposefully engage in using OPR (Cheung et al., 2008; Cheung & Thadani, 2012).	(Huang & Yang, 2011; Kim & Gupta, 2012; Park & Lee, 2009a; Senecal & Nantel, 2004; Zhao & Xie, 2011)	(Casaló et al., 2011; Cheung et al., 2008; Cheung et al., 2007, 2009; Chu & Kim, 2011; Cramer et al., 2008; Kim & Gupta, 2012; Kramer, 2007; K.-T. Lee & Koo, 2012; H. Luo et al., 2015; Martin & Lueg, 2013; Rabjohn et al., 2008; Shi et al., 2013; Tseng & Hsu, 2010; Zhang et al., 2010; Zhang & Watts, 2008)	(Cheung et al., 2008; Cheung et al., 2009; Fan & Miao, 2012; Filieri & McLeay, 2014; Liu & Zhang, 2010; Luo et al., 2013; Rabjohn et al., 2008)
28	OPR Continuance Intention				
29	Intention to purchase/shop online	Consumers' willingness to pay for or purchase the service/product (Benlian et al., 2012)	(Hsu et al., 2013; Huang & Chen, 2006; Jensen et al., 2013; Jones et al., 2009; Lee & Youn, 2009; Li & Wang, 2013; Park & Lee, 2009b; Park & Kim, 2009; Park et al., 2007; Xia & Bechwati, 2008; Yao et al., 2009)	(Baum & Spann, 2014; Benlian et al., 2012 Cheong & Morrison, 2008; Cheung & Lee, 2008; Choi & Scott, 2013; Dabholkar & Sheng, 2012; Doh & Hwang, 2009; Floh et al., 2013; Gottschlich, Heimbach, & Hinz, 2013; Hao, Ye, Li, & Cheng, 2010; Jensen et al., 2013; Ku & Tai, 2013; Lim et al., 2006; Lin et al., 2011; Lo & Lin, 2013; Martin & Lueg, 2013;	(Gruen et al., 2006; Fan & Miao, 2012; Hsiao et al., 2010; Hsu et al., 2013; huang et al., 2012)

				Ozturkcan & Gursoy, 2014; Park & Kim, 2009; Park et al., 2007; Sia et al., 2009; Sparks & Browning, 2011; Tseng & Hsu, 2010; Yao et al., 2009; Zhang et al., 2011)	
30	Loyalty intention	Consumer's intention to buy from the website in the future, and to recommend it to other consumers (Román, 2010).			(Gruen et al., 2006; Román, 2010; Serenko & Stach, 2009)

APPENDIX C1: Experts' Opinions on Construct Measurements and Required Changes

Constructs	Items	Comments by Academicians		Comments by Online Retailer	Comments by Online Customers		Outcomes
		Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	
Perceived Enjoyment (PE)	Using the OPR for online buying was PE1.Not enjoyable….. Enjoyable. PE2. Unpleasable….. Pleasurable. PE3. Dull….. Neat PE4. Unexciting….. Exciting PE5. Not fun….. Fun.	#PE5 ….. Find a better word that can represent "Not Fun" … e.g. Entertaining …….Tiring/ Pleasant ……unpleasant	I personally do not agree with Venkatesh and Bala paper, where PE has its own right. It is true that PE is an important construct when it comes to OPR, hence I will not disagree on the construct itself. But when it comes to OPR, other constructs such as familiarity and perceived known functionality can play a role whether OPR is fun or not.	It could be boring or exciting. Dull or neat need explanation. Seems bit confusing to me	OK. It is true that PE is an important construct when it comes to OPR, hence I am not disagree on the construct.	PE3 is little bit confusing. Need to add: Angry ….. Not Angry Remaining are ok.	**-PE3, PE4 and PE5 Need to be corrected** **New Items** **- Pleasant/Unpleasant** **-Entertaining included**
Perceived Usefulness (PU)	PU1. Using the OPR enables me to find products I want more quickly. PU2. Using the OPR enhances my effectiveness in finding a suitable product. PU3. If I use the OPR, I will increase the quality of my judgments. PU4. Using the type of OPR allows me to accomplish more	OK. But pls take note that TAM is over researched! If possible find more contemporary model to be adopted.	I agree with this assessment. Add: OPR enabled me to evaluate the product.	Ok. Such OPR give more sense of security and reliability which is the most important for an online customer	I agree with this assessment.	Need to add: OPR assisted me to understand the performance of the product. Remaining are ok	**New items:** **1- OPR enabled me to evaluate the product.** **2- OPR assisted me to understand the performance of the product.**

	analysis than would otherwise be possible.						
Perceived Ease of Use (PEOU)	To make an accurate judgment, comprehending/ using the OPR was PEOU1….. Easy for me. PEOU 2….. Understandable. PEOU 3….. Clear and simple. PEOU 4….. Required less effort. PEOU 5….. Required less time.	OK on the scale but….. To make an accurate judgement of what?? I presume you will guide the respondent within the instruction.	I would like to add one construct here, which is perceived for absorbed interaction. By this I mean, users do not even think about the systems and its function anymore since they know the system by heart, hence they can interact with in absorbed fashion (as oppose to reflective fashion). I think, the matured construct of PEDC is absorbed coping.	Ok- but also add. Comprehending this type of OPR was easy but need more improvement	The time to reach decision is quiet important and requires PEOU. The constructs are justifiable.	Agreed.	**Need to correct the sentence: to make accurate judgement**
Perceived Confirmation (PC)	PC1. My experience with using the OPR was better than what I expected. PC2. The service level provided by the OPR was better than what I expected. PC3. Overall, most of my expectations from using the OPR were confirmed.	Can u add another 2 items here?	This is a tricky one, even in my IS research work. Confirmatory factors are not always perceptive, but external. For example, someone's affirmation for our use of OPR can be taken as confirmatory factor, even though we are not perceiving any from the OPR itself.	Ok	Ok	Add also: (1) meet my expectations. (2) Below my expectations.	**OK.**
Trusting belief	**<u>Competence Trust</u>** TC1. The OPR was competent in recommending the required product.	CT & ET not balance in terms of the no of items.	I agree with this construct.	Ok- but also add: This type of OPR is confusing since there is real authority involved to enhance the customer trust	Peer recommendation is very important. You can try to accommodate it in this model.	TB1 is confusing. And also check grammar of TB2. Rest are ok.	**-CT required to be balance in terms of items** **-TBI and TB2 required to correct**

	TC2. The OPR performed its role of recommending the product very effectively. **<u>Benevolence Trust</u>** TB1. I believe that the OPR's dealings with me were in my best interest. TB2. The OPR's dealings with me felt like it would do its best to help me. TB3. Overall, the OPR supported me to find a suitable product **<u>Integrity Trust</u>** TI1. I believe the OPR was truthful to me. TI2. I would characterize the OPR's dealings with me as honest. TI3. The OPR appeared to be unbiased. TI4. The OPR is sincere and genuine						
Perceived Decision Effort (PDE)	PDE1. The product selection task that I went through was too complex. PDE2. The task of selecting the product using the OPR was too complex. PDE3. Selecting the product using the OPR required too much effort. PDE4. The task of selecting the product using the OPR took too much time.	Take out all "too" in the items…. Make the sentences as neutral as possible. Let the scale measures!	I think, we also need to consider decision effort that comes with payment options. I know here in Sweden for example, they develop a system called Klarna, where you don't even have to worry paying right there, that you can pay in three month or receipt comes to your door in the next few	Ok	The decision efforts required is the most important factor which controls the remaining variables especially CS. How about in positive aspects, the product selection was too easier or straight forward	PDE1 and PDE2 seems to be similar. Need to add: it help to save time.	**-Remove "too"** **-PDE1 and PDE2 seems to be similar require changing the sentence**

			weeks. I think, that makes the decision effort much easier.				
Perceived Decision Quality (PDQ)	PDQ1. The product that suited my preferences were suggested by the OPR. PDQ2. The product that best matched my needs were provided by the OPR. PDQ3. I would choose from the same set of alternative products provided by the OPR on my future purchase occasion. PDQ4. I am confident that the product recommended is best choice to buy. PDQ5. I believe that the OPR helped me avoid making a poor choice. PDQ6. Overall, I believe that the OPR helped me to make the best decision possible.	OK. Add: Product recommended by OPR is best choice to buy. Helped me to avoid poor choice.	Ok	Ok- but also add: This type of OPR have enhance my decision power.	You can add negation as well. "Helped me to make best decision possible. etc. The remaining constructs are justifiable.	Agreed.	**New items:** **1- Product recommended by OPR is best choice to buy.** **2-Helped me to avoid poor choice.** **3- This type of OPR have enhance my decision power.** **4- Helped me to make best decision possible**
Customer Satisfaction (CS)	How do you feel about your overall experience of OPR use? CS1. Very dissatisfied/Very satisfied. CS2. Very displeased/Very pleased. CS3. Very frustrated/Very contented. CS4. Absolutely terrible/Absolutely delighted.	How do you measure them? Semantic I guess.	I think, this construct looks general and it is OK.	Ok	More constructs can be generated in CS as the level of CS varies. Very satisfied, Satisfied or less satisfied. At least 6 CS should be present to gauge amount of CS.	Need to add: Trustworthy…..Un-trustworthy	**Ok.** **Semantic Scale**

OPR Continuous usage Intention (CU)	If you needed to purchase a similar product in the future, how likely is it that . . . CU1... you would intend to continue using the OPR in the future? CU2 . . . you would predict your use of the OPR to continue in the future? CU3 . . . you plan to continue using the OPR in the future? CU4 . . . you would continue to pay attention to the OPR?	ok	I guess this construct give you the best opportunity for relating how OPR affects continuous usage use. I would see this construct a more of dependent variable, where you can test other constructs.	Ok- but also add: would you benefit OPR recommendation in future.	Ok	Agreed.	**OK**

APPENDIX D1: Exploratory Factor Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.955
Bartlett's Test of Sphericity	Approx. Chi-Square	34852.126
	df	861
	Sig.	.000

	OPRCI	DE	PDQ	SAT	PEOU	PU	PC	TC	TI	ENJ
OPRCI1	.973									
OPRCI2	.970									
OPRCI3	.984									
OPRCI4	.967									
DE1		.852								
DE2		.918								
DE3		.939								
DE4		.927								
DQ1			.814							
DQ2			.844							
DQ3			.850							
DQ4			.794							
DQ5			.846							
SAT1				.742						
SAT2				.863						
SAT3				.888						
SAT4				.881						
EOU1					.938					
EOU2					.952					
EOU3					.955					
EOU4					.906					
EOU5					.910					
PU1						.819				
PU2						.849				
PU3						.848				
PU4						.797				
PU5						.836				
PC1							.787			
PC2							.705			
PC3							.787			

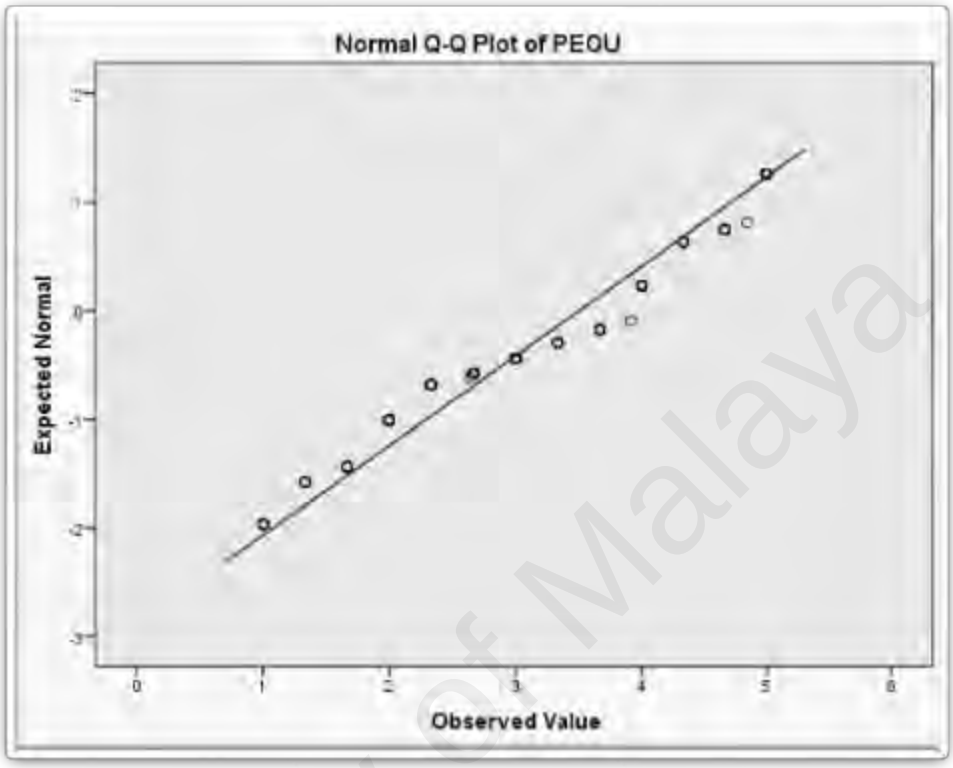
Continued….										
	OPRCI	**DE**	**PDQ**	**SAT**	**PEOU**	**PU**	**PC**	**TC**	**TI**	**ENJ**
TC1								.819		
TC2								.856		
TC3								.822		
TB1								.538		
TB2								.527		
TB3								.501		
TI1									.770	
TI2									.777	
TI3									.784	
TI4									.791	
ENJ1										.831
ENJ2										.842
ENJ3										.858
ENJ4										.857
ENJ5										.864

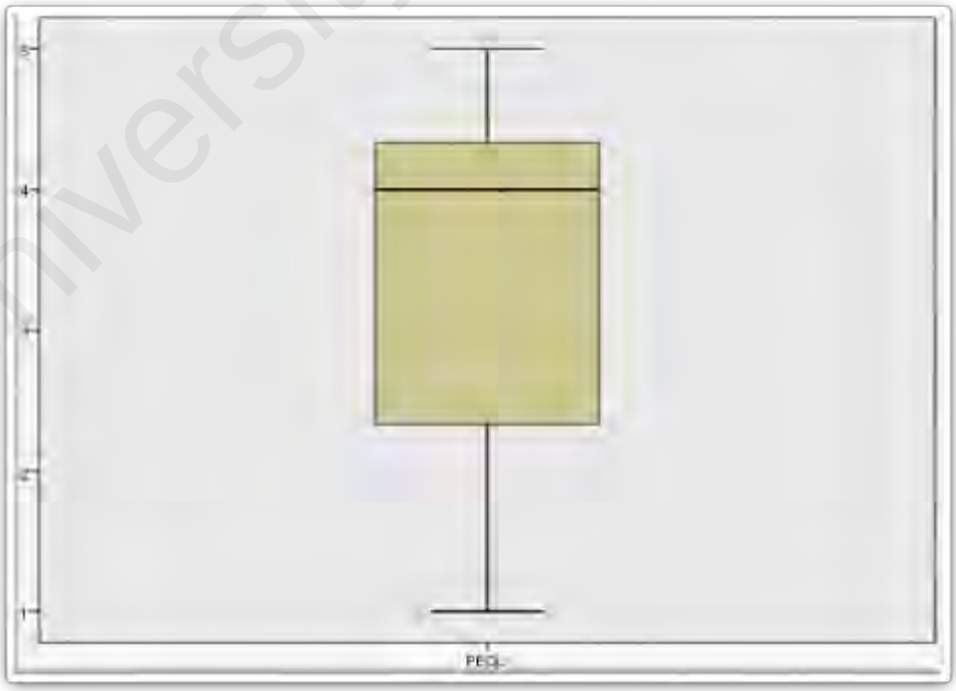
APPENDIX D2: Confirmatory Factor Analysis

	OPRCI	DE	PDQ	SAT	PEOU	PU	PC	TC	TI	ENJ
OPRCI1	**0.973**	0.351	0.722	0.623	0.252	0.710	0.554	0.485	0.634	0.440
OPRCI2	**0.970**	0.344	0.711	0.636	0.256	0.692	0.541	0.485	0.618	0.456
OPRCI3	**0.984**	0.348	0.723	0.637	0.272	0.715	0.556	0.489	0.628	0.442
OPRCI4	**0.967**	0.340	0.712	0.619	0.263	0.704	0.541	0.473	0.643	0.443
RCDE1	0.341	**0.886**	0.374	0.328	0.119	0.361	0.335	0.287	0.368	0.200
RCDE2	0.342	**0.933**	0.363	0.311	0.111	0.340	0.343	0.294	0.367	0.167
RCDE3	0.333	**0.948**	0.355	0.316	0.125	0.340	0.344	0.290	0.343	0.187
RCDE4	0.297	**0.930**	0.335	0.298	0.094	0.314	0.336	0.295	0.323	0.167
DQ1	0.647	0.355	**0.894**	0.635	0.213	0.729	0.665	0.527	0.681	0.485
DQ2	0.645	0.352	**0.915**	0.633	0.201	0.710	0.675	0.553	0.674	0.492
DQ3	0.621	0.361	**0.912**	0.614	0.186	0.702	0.678	0.559	0.689	0.497
DQ4	0.703	0.330	**0.870**	0.623	0.199	0.737	0.586	0.484	0.635	0.433
DQ5	0.700	0.340	**0.910**	0.628	0.174	0.755	0.682	0.527	0.665	0.475
CS1	0.703	0.349	0.703	**0.900**	0.191	0.671	0.605	0.491	0.645	0.539
CS2	0.593	0.317	0.658	**0.950**	0.177	0.598	0.567	0.464	0.581	0.564
CS3	0.551	0.307	0.609	**0.939**	0.169	0.551	0.564	0.436	0.550	0.573
CS4	0.549	0.286	0.614	**0.933**	0.170	0.547	0.554	0.451	0.530	0.584
EOU1	0.235	0.104	0.186	0.162	**0.942**	0.219	0.133	0.114	0.157	0.200
EOU2	0.254	0.110	0.215	0.186	**0.961**	0.240	0.145	0.108	0.187	0.213
EOU3	0.252	0.110	0.207	0.194	**0.964**	0.236	0.163	0.122	0.181	0.214
EOU4	0.257	0.120	0.203	0.171	**0.918**	0.223	0.151	0.130	0.183	0.198
EOU5	0.261	0.128	0.205	0.180	**0.924**	0.221	0.174	0.153	0.164	0.216
PU1	0.664	0.352	0.755	0.598	0.230	**0.934**	0.634	0.472	0.676	0.411
PU2	0.698	0.358	0.770	0.608	0.216	**0.951**	0.633	0.472	0.686	0.386
PU3	0.665	0.309	0.740	0.577	0.189	**0.922**	0.598	0.452	0.636	0.383
PU4	0.684	0.344	0.753	0.605	0.246	**0.914**	0.623	0.490	0.656	0.449
PU5	0.670	0.347	0.749	0.585	0.247	**0.945**	0.613	0.482	0.686	0.406
PC1	0.543	0.359	0.703	0.602	0.145	0.647	**0.983**	0.533	0.630	0.548
PC2	0.544	0.344	0.708	0.579	0.183	0.629	**0.927**	0.513	0.626	0.554
PC3	0.543	0.359	0.703	0.602	0.145	0.647	**0.983**	0.533	0.630	0.548
TC1	0.503	0.335	0.560	0.467	0.151	0.520	0.517	**0.932**	0.565	0.417
TC2	0.405	0.273	0.514	0.455	0.094	0.414	0.511	**0.926**	0.511	0.430
TC3	0.469	0.267	0.563	0.457	0.124	0.475	0.492	**0.923**	0.552	0.413
TI1	0.645	0.384	0.723	0.596	0.205	0.706	0.606	0.556	**0.947**	0.419
TI2	0.488	0.317	0.628	0.520	0.149	0.584	0.598	0.534	**0.893**	0.414
TI3	0.641	0.359	0.720	0.607	0.180	0.713	0.624	0.568	**0.962**	0.418
TI4	0.648	0.360	0.712	0.603	0.161	0.676	0.617	0.537	**0.945**	0.452
ENJ1	0.397	0.189	0.473	0.524	0.223	0.386	0.533	0.391	0.403	**0.894**
ENJ2	0.453	0.219	0.521	0.577	0.190	0.408	0.566	0.457	0.442	**0.924**
ENJ3	0.445	0.219	0.511	0.576	0.211	0.423	0.539	0.442	0.444	**0.929**
ENJ4	0.413	0.134	0.471	0.569	0.177	0.408	0.474	0.398	0.396	**0.893**
ENJ5	0.343	0.100	0.401	0.482	0.200	0.336	0.450	0.340	0.355	**0.874**

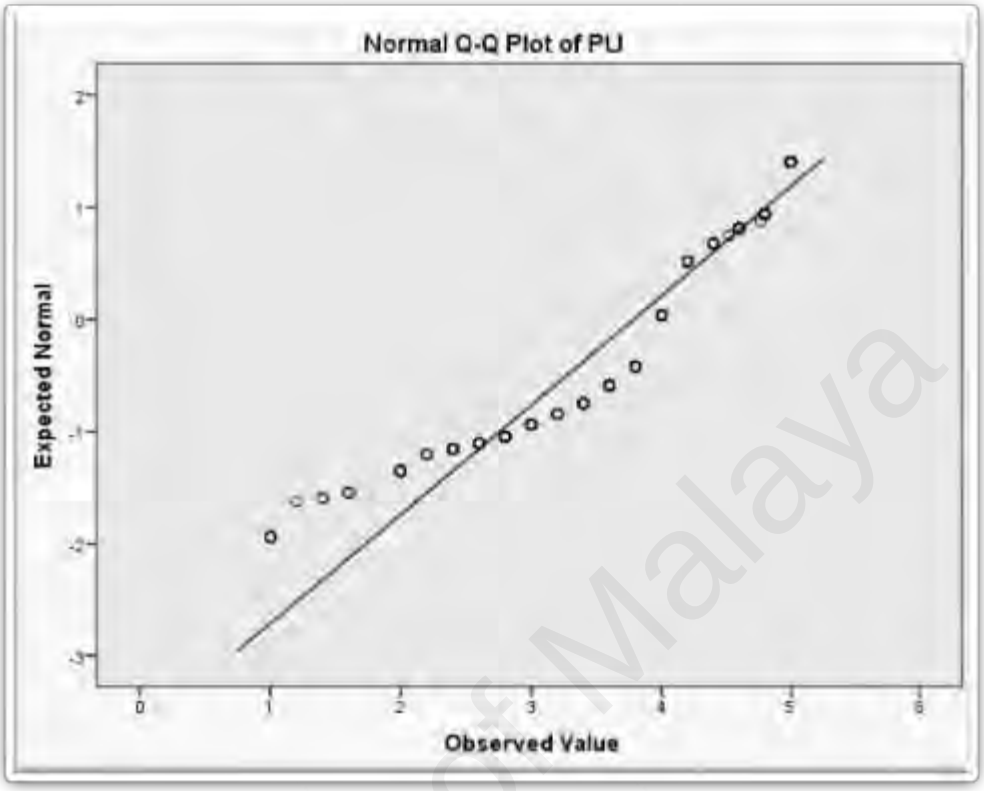
APPENDIX D3: Normality test (Q-Q plot and Box plot)

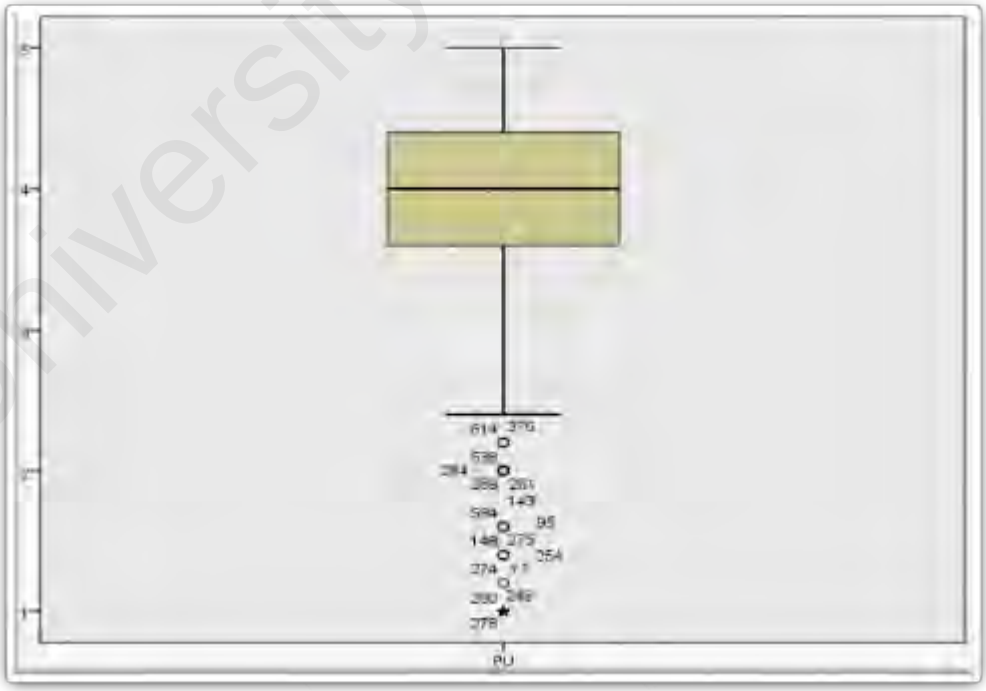
Perceived Ease of Use



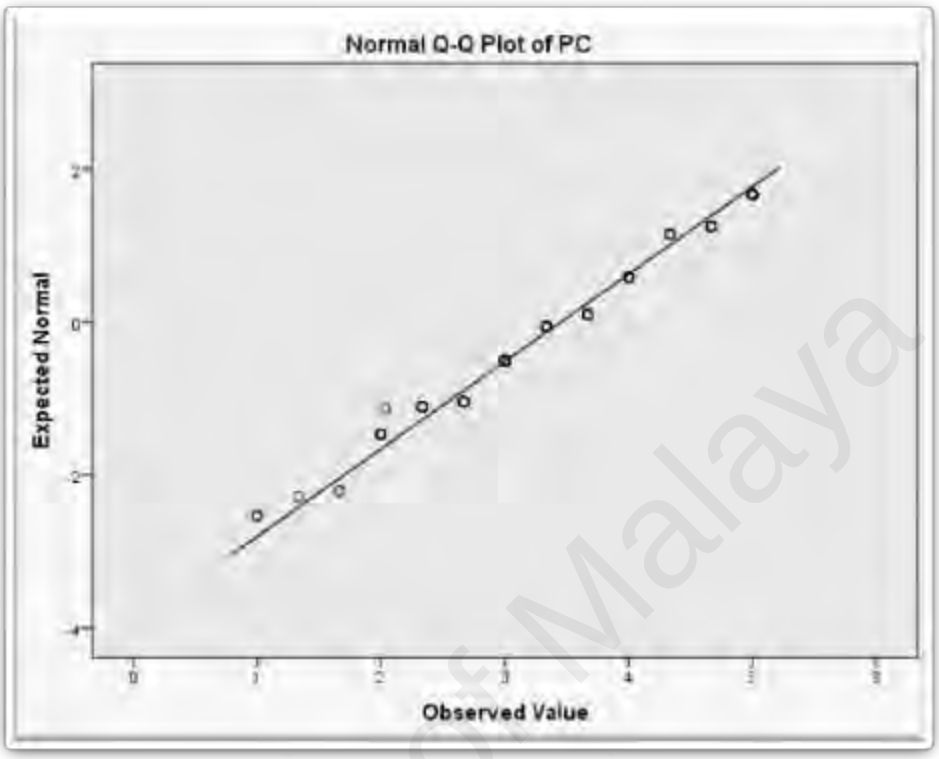


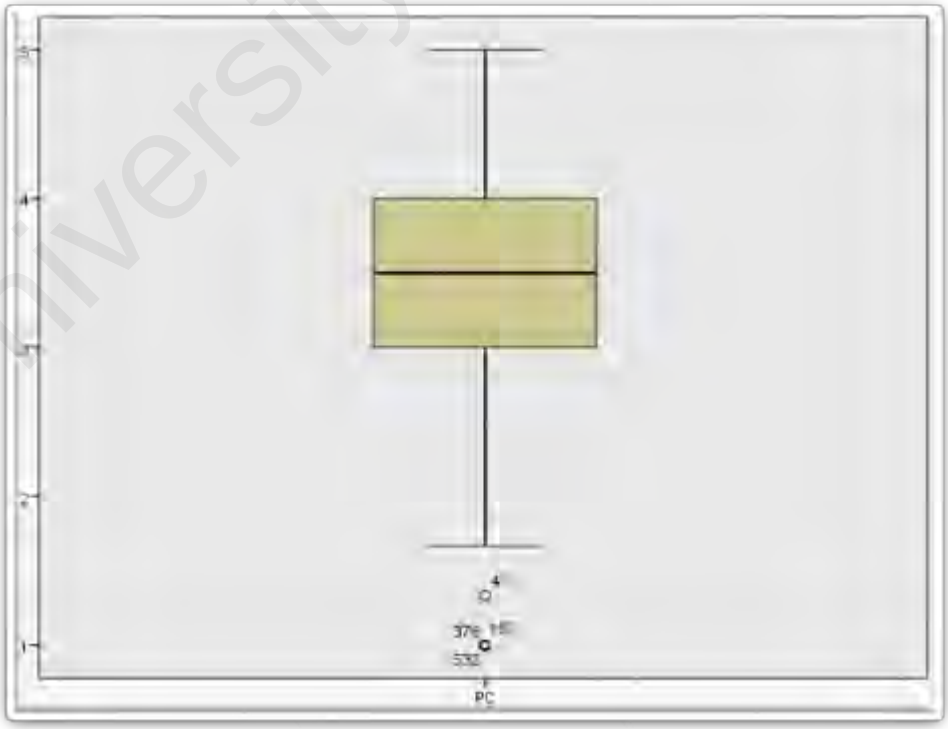
Perceived Usefulness



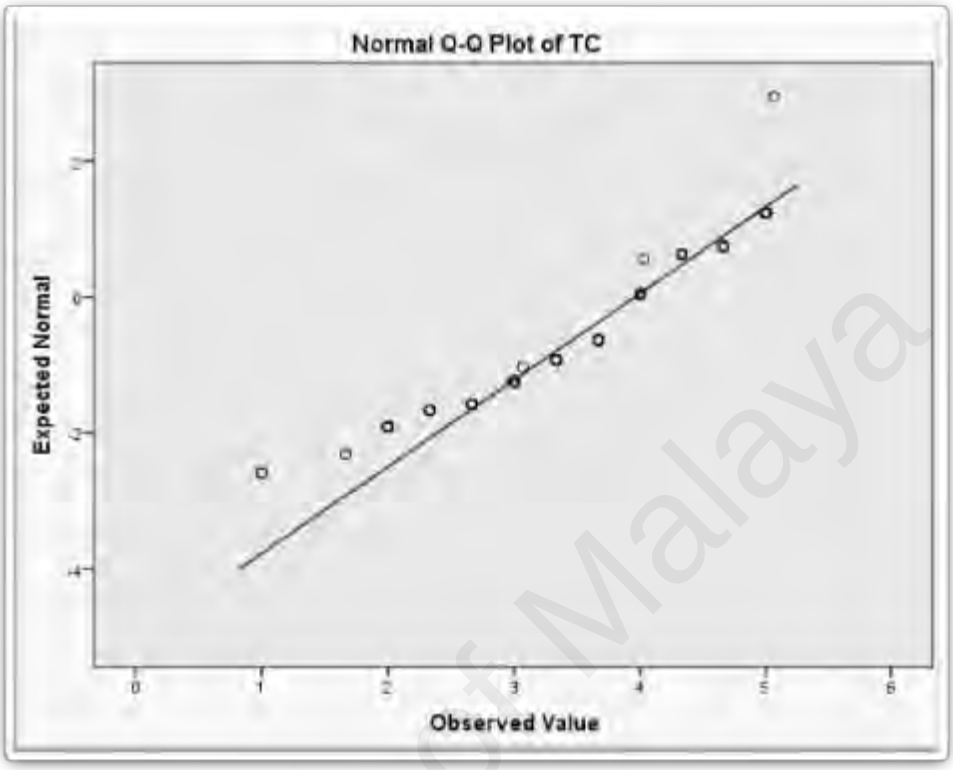


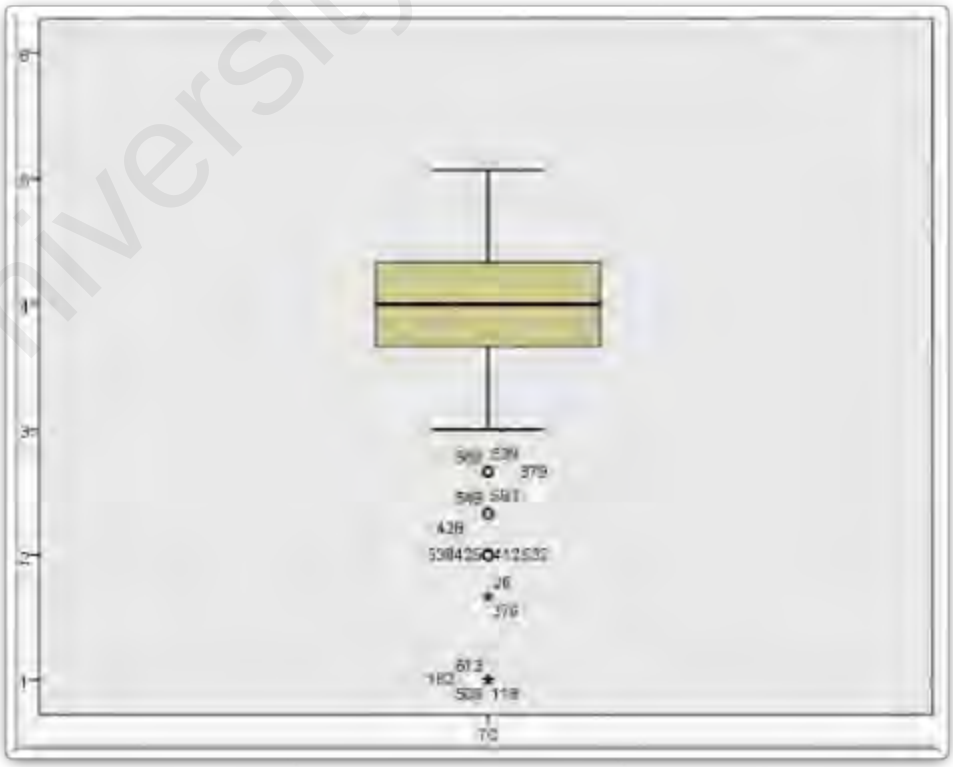
Perceived Confirmation



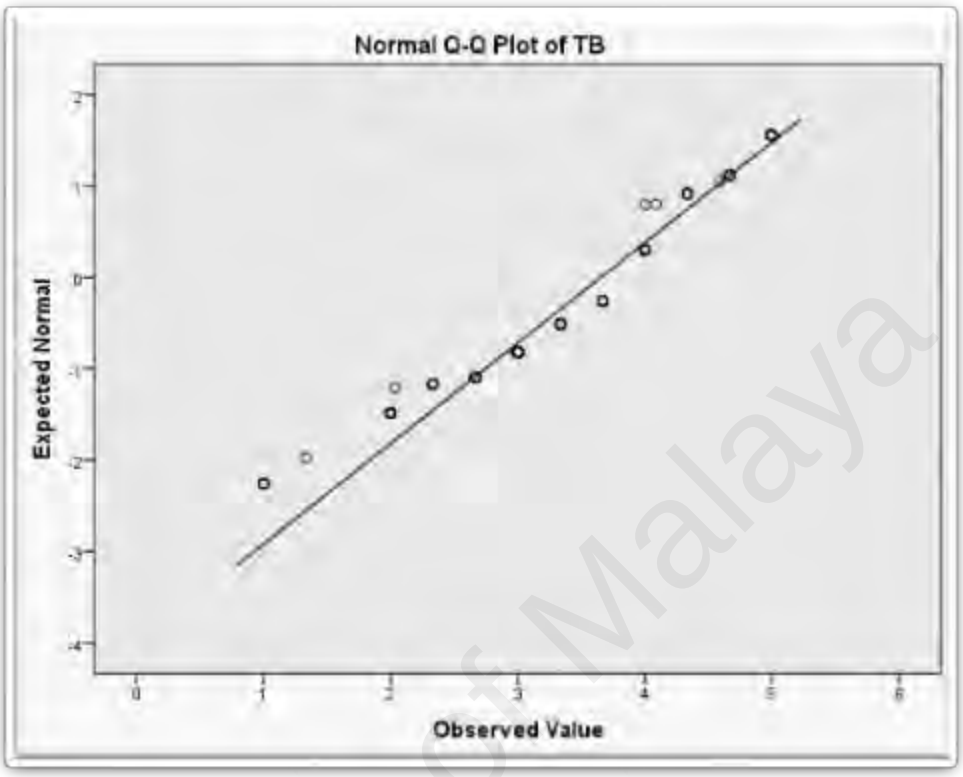


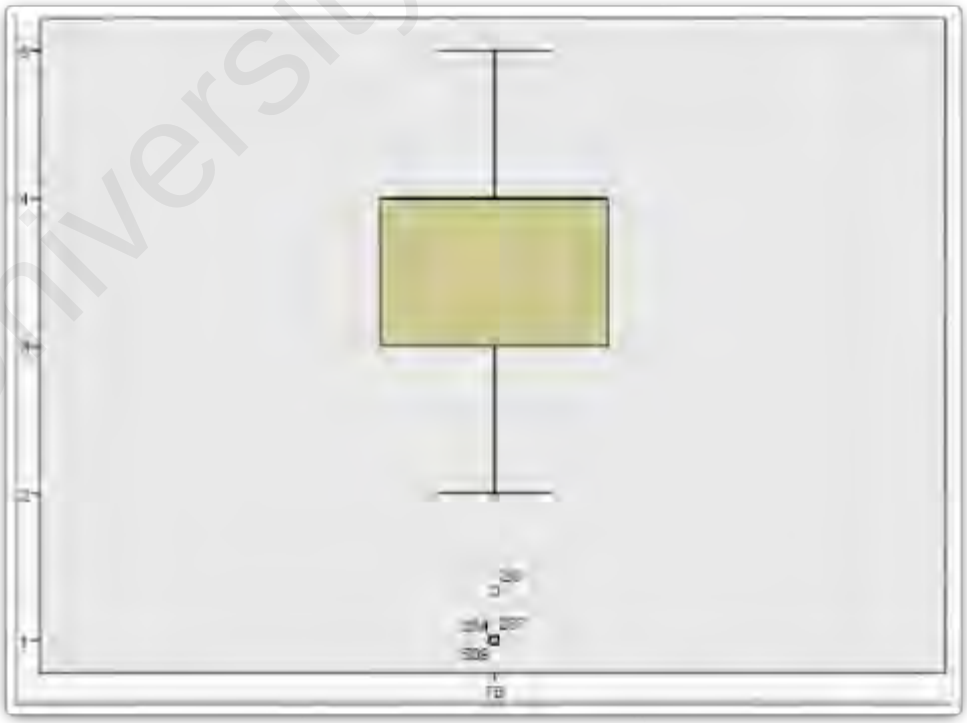
Trust Competence



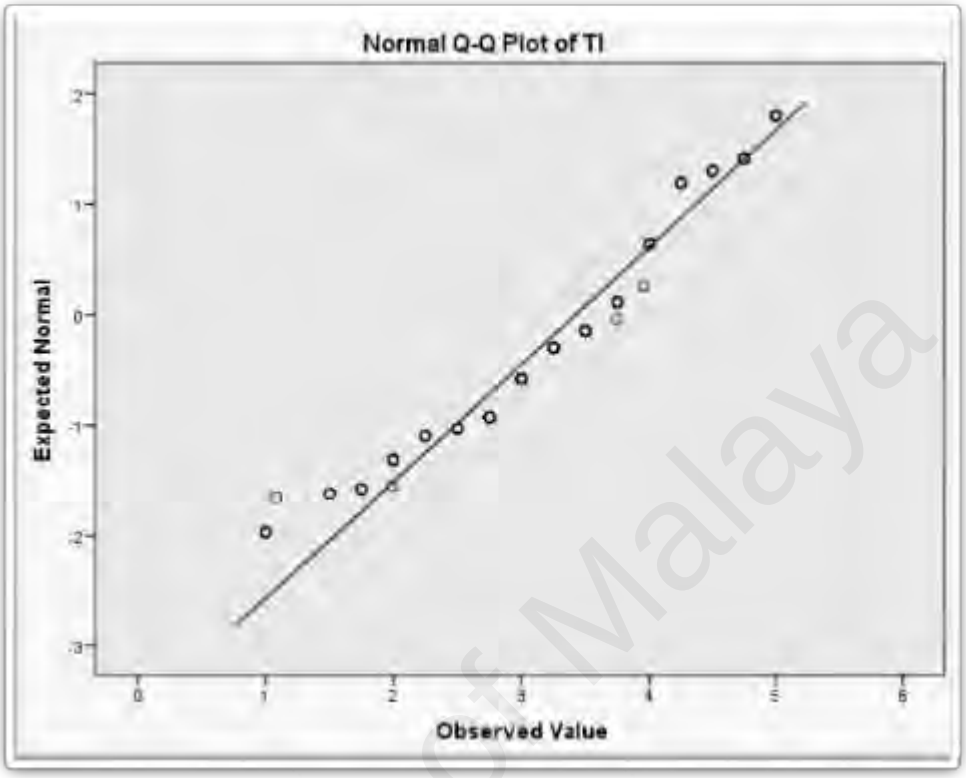


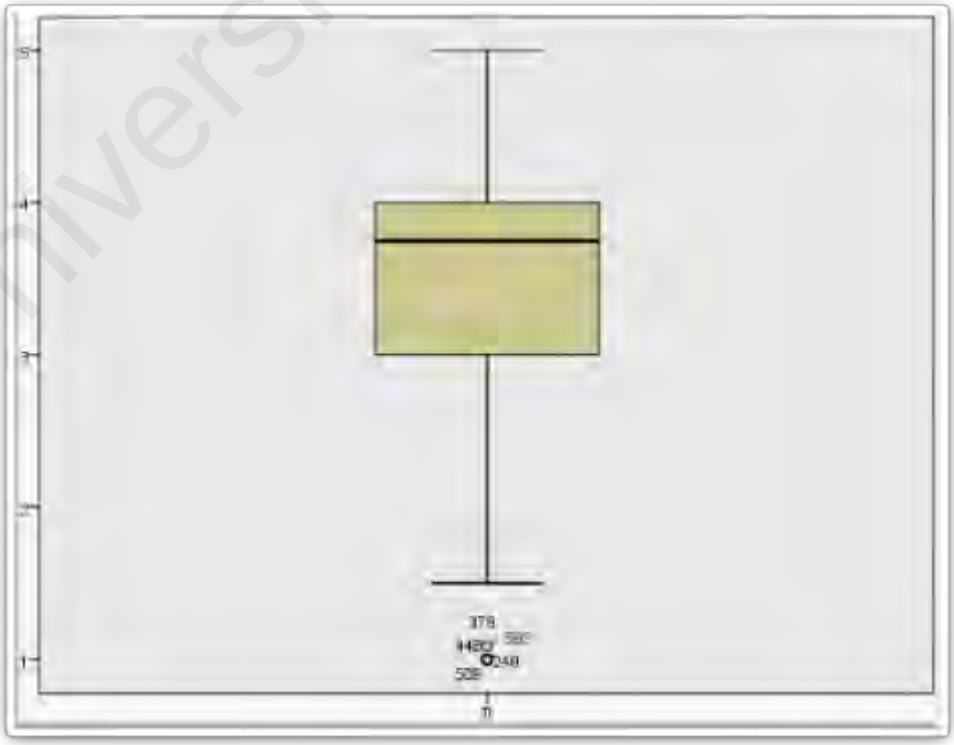
Trust Benevolence



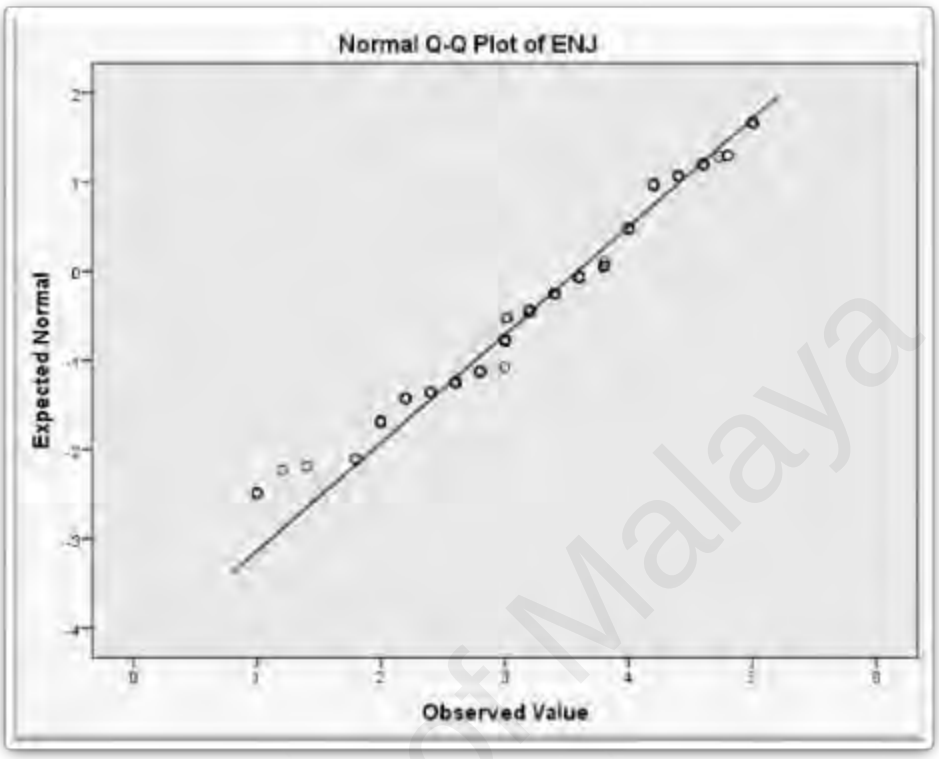


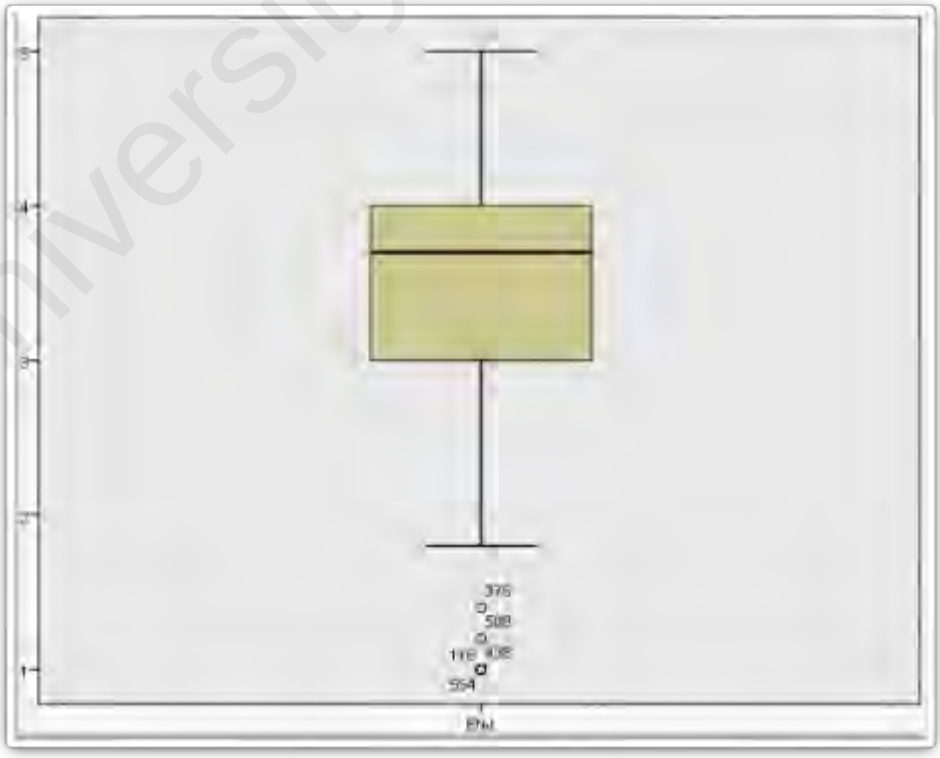
Trust Integrity



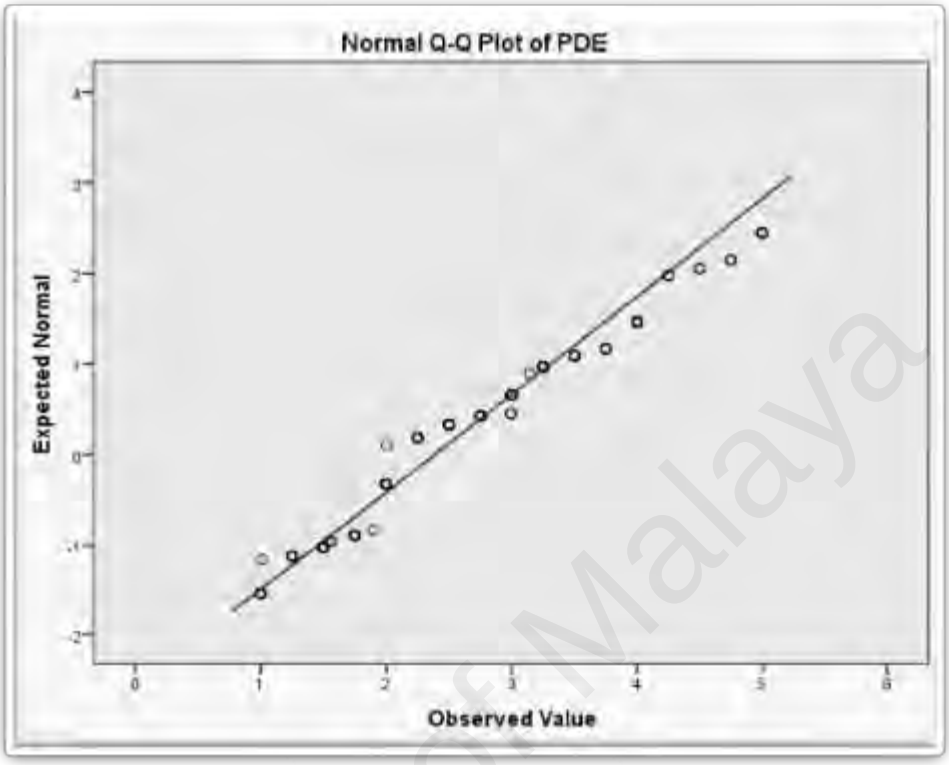


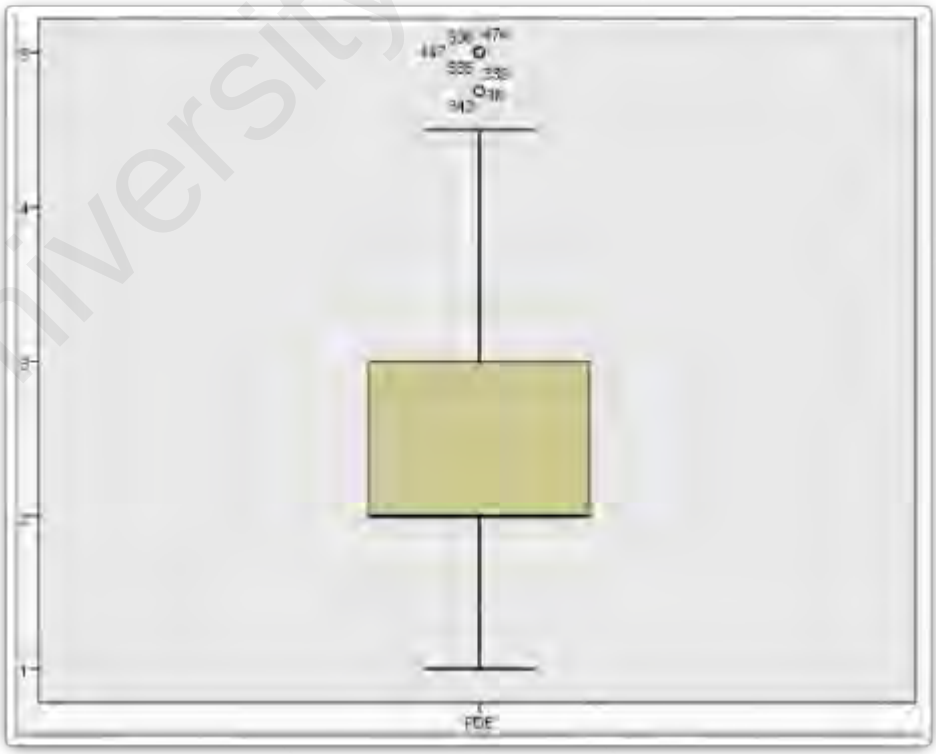
Perceived Enjoyment



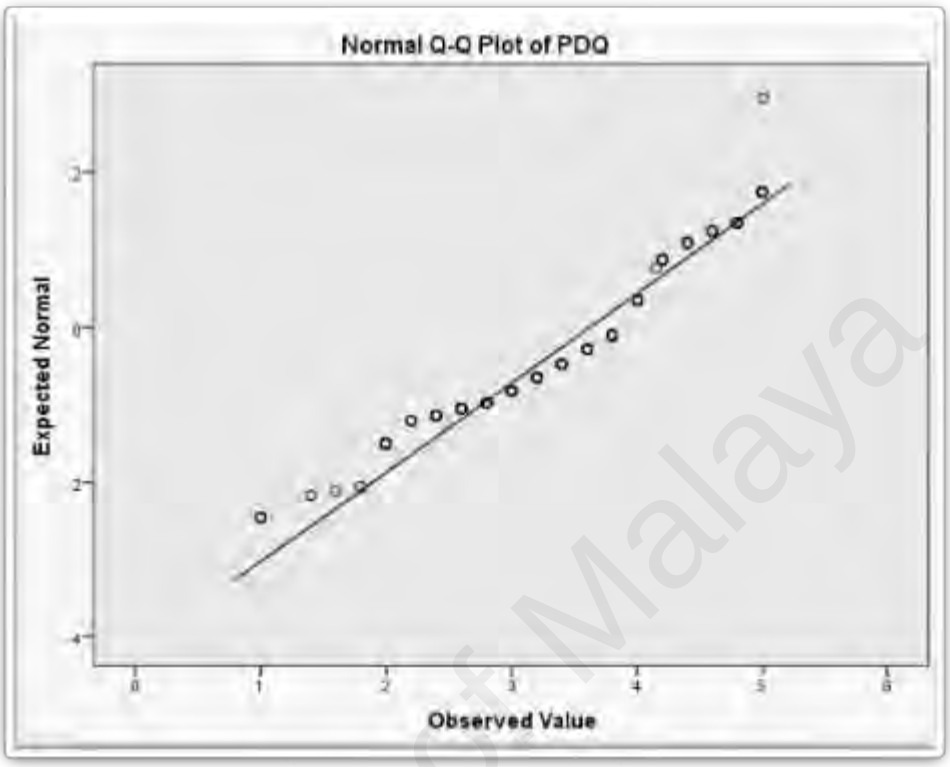


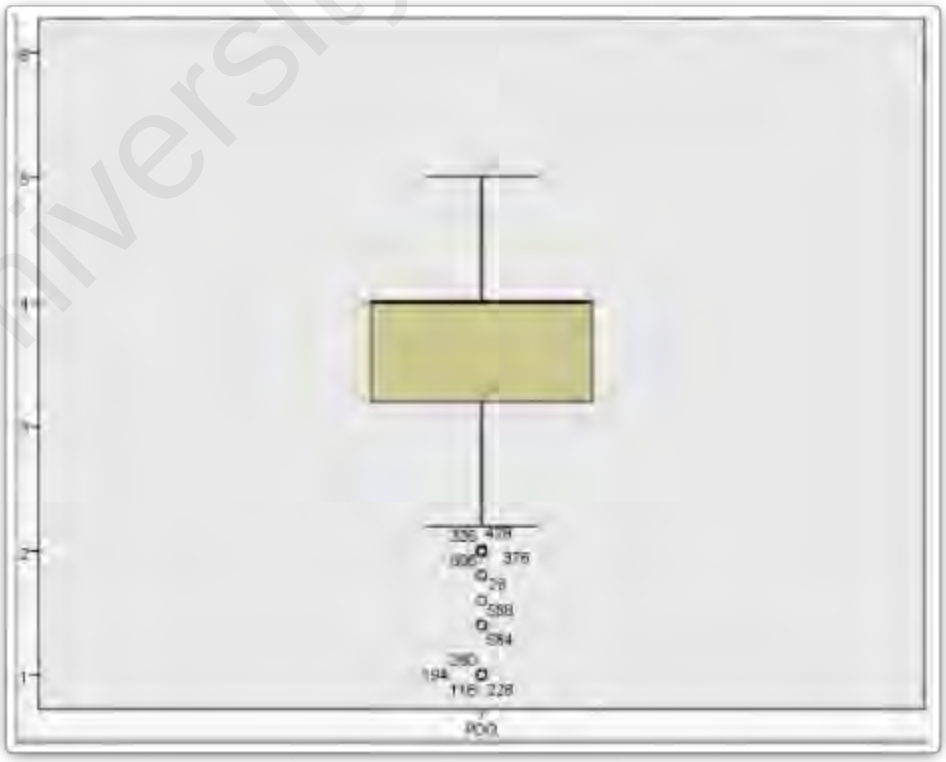
Perceived Decision Effort



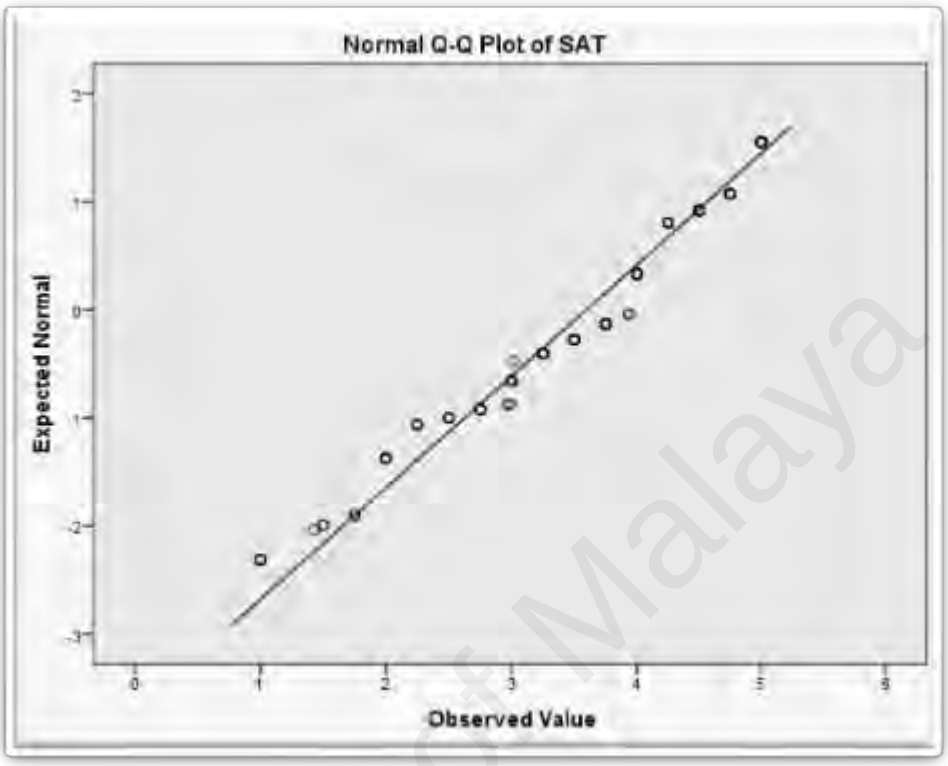


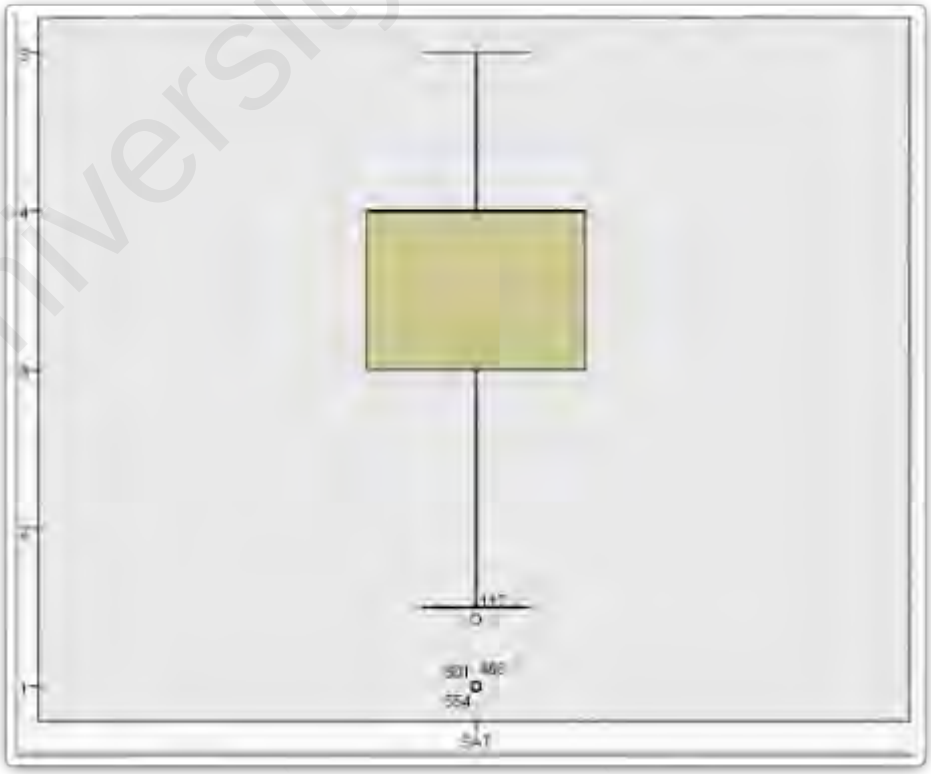
Perceived Decision Quality





Satisfaction





OPR Continuous Usage Intention