An empirical study of product differences in consumers’
E-commerce adoption behavior

Xiao Liu\textsuperscript{a}, Kwok Kee Wei\textsuperscript{b,*}

\textsuperscript{a}Department of Information Systems, National University of Singapore, Lower Kent Ridge Road, Singapore 119260, Singapore
\textsuperscript{b}Department of Information Systems, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong

Received 1 November 2002; received in revised form 14 March 2003; accepted 18 April 2003

Abstract

This research investigates product differences in the overlooked context of individuals’ adoption of E-commerce. A theoretical model of consumers’ E-commerce adoption intention is developed and tested. Consumers’ behavior is studied. The results show that when considering purchasing goods, as compared to services, over the Internet, consumers’ E-commerce adoption decisions are more strongly influenced by their perceptions of risk. In contrast, when considering purchasing services over the Internet, consumers’ E-commerce adoption decisions are more strongly influenced by their perceptions of ease of use. Specific recommendations for practitioners regarding the adoption of E-commerce in product (physical goods) businesses and service businesses are also offered.
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Keywords: Perceived usefulness; Perceived ease of use; Perceived risk; Consumers’ E-commerce adoption intention

1. Introduction

Products could be classified into two groups: goods and services. Marketing researchers have long suggested that in a traditional shopping environment, consumers would behave differently when purchasing goods compared to when they purchase services [2,22,23,25]. While it is believed that, in the online environment, the same observation will hold, only modest efforts have been devoted to examining the effect of product type on consumers’ online shopping behavior. Hence, theories on product effects in an online environment need to be developed.

This paper investigates the moderating effects of product type on the relationships between consumers’ perceptions about E-commerce and consumers’ intention to adopt E-commerce. Most importantly, a theoretical model of consumers’ E-commerce adoption intention is developed and tested.

2. Prior literature on product differences

2.1. Differences between goods (physical products) and services in the traditional shopping environment and their differences in the E-commerce environment

Lusch and Lusch [25] suggest that in the traditional shopping environment, there are four unique
characteristics of services which differentiate services from goods. These characteristics are generally summarized as intangibility, inseparability, heterogeneity and perishability. However, due to the lack of social presence and product presence in the E-commerce environment [18], consumers may have different perceptions of the differences between goods and services in the E-commerce environment, compared with the situation in the traditional shopping environment. Thus, the dimensions of differences between goods and services need to be reexamined in the context of E-commerce.

2.2. Intangibility

In the traditional shopping environment, services are intangible. They cannot be seen, tasted, felt, heard or smelled before they are bought [22]. The major problem that intangibility creates is the difficulty that the customer has in judging the value of the service before it is actually purchased [25]. In contrast, goods are tangible.

In the E-commerce environment, goods—as much as services—are perceived to be intangible. That is because consumers cannot touch, taste, feel, hear and smell the goods before they make purchase decisions. In other words, consumers in the E-commerce environment do not differentiate services from goods based on the dimension of intangibility. Therefore, it may not be appropriate to use intangibility to differentiate services and goods in the E-commerce environment.

2.3. Inseparability

In the traditional shopping environment, services are typically produced and consumed simultaneously [23]. The production and consumption of services are inseparable, and selling comes before both [25]. If the service is rendered by a person, the provider is part of the service [23]. The client is also present when the service is produced. Thus, both the provider and the client will affect the service outcome [22]. Goods, however, are first produced, then sold, and finally consumed [25].

Likewise in the E-commerce environment, the inseparability of production and consumption distinguishes services from goods. But it also introduces additional differences between the two that are unique to the E-commerce environment.

First, the inseparability of production and consumption enables consumers to derive immediate satisfaction from online transactions for services through being involved in the production and consumption of services. In contrast, consumers’ satisfaction from goods purchased online is subject to a prolonged delay. For not only is the consumption of goods separated from the production and thus make it necessary for goods to be delivered to consumers before consumption, there is also a delay in the delivery of goods in the E-commerce environment. The delay of delivery in turn creates uncertainty about the goods. Consumers may find it difficult to check whether the goods ordered are what they want. It is also difficult for consumers to predict the quality of goods since they cannot get the goods immediately after their orders. Thus, people tend to be more concerned about the risk involved when purchasing goods rather than services online. More also fear negative outcome and potential losses when considering purchasing goods than services online.

Second, the inseparability of production and consumption of services may prompt the perception that online transactions are more complex for services than for goods [20]. That is because the consumer is required to take part in the production and consumption of services without the benefit of social presence, i.e., the presence of the seller, in the E-commerce environment. Moreover, the quality of services does indeed depend largely on the consumers themselves. Thus, people would tend to have more concerns and expectations of the ease of use when they consider purchasing services rather than goods online.

2.4. Heterogeneity

In the traditional shopping environment, services are highly variable in quality as they depend on who provides them as well as when and where they are provided [22,23]. In contrast, modern production lines ensure that tangible products are at least consistent in quality, even though that quality can be good or bad [2]. Thus, the quality of services in the traditional shopping environment is perceived to be
inconsistent while the quality of goods, regardless of good or bad, is perceived to be consistent. Online services, however, are standardized and digitalized. So, their quality does not depend on situational factors such as form, place and time. Thus, it is likely that the quality of service in the E-commerce environment would be perceived as consistent. Goods ordered online, however, may be damaged during shipment and delivery. So unlike goods in the traditional shopping environment, goods in the E-commerce environment may not be perceived to be consistent in quality. It is therefore very difficult and inappropriate to differentiate services from goods in the E-commerce environment on the dimension of heterogeneity.

2.5. Perishability

In the traditional shopping environment, the inventory of services is different from that of goods. Services cannot be stored or inventoried because they are intangible [25]. If there are not enough employees and resources available to meet the demand for services, customers will leave dissatisfied [25].

In the E-commerce environment, although services still cannot be stored and inventoried as in the traditional shopping environment, they are available for purchase at anytime, anywhere, and according to the consumers’ individual convenience. Also, consumers do not have to wait in a long queue for the services. On the other hand, some goods such as foods are perceived to be perishable due to the delay of delivery. It appears therefore very difficult and inappropriate to differentiate services and goods in the E-commerce environment on the dimension of perishability.

3. Theoretical model and hypotheses

Perceived usefulness, perceived ease of use and perceived risk are suggested to be the three most important antecedents of consumers’ E-commerce adoption intention [21,27]. These constructs are developed based on the Technology Acceptance Model (TAM) [7,10], which is used for studying users’ technology acceptance behavior. However, consumers’ E-commerce adoption intention includes not only the intention to adopt the E-commerce technology, but also the intention to adopt the new shopping concept: making purchases over the Internet. Therefore, perceived usefulness, perceived ease of use and perceived risk need to be redefined and developed for studying consumers’ E-commerce adoption behavior.

3.1. Perceived usefulness

In TAM, perceived usefulness (PU) is defined as “the extent to which a person believes that using a particular technology will enhance his or her job performance” [7,30]. In the online environment, perceived usefulness is about the perception of the usefulness of making purchases over the Internet. Therefore, in this study, perceived usefulness is defined as the extent to which a person believes that making purchases over the Internet (E-commerce) will create value for him or her.

If consumers perceive a high level of usefulness of making purchases over the Internet, they would likely make the actual purchases online. It is believed that

H1: Perceived usefulness will have a significant positive effect on consumers’ E-commerce adoption intention.

3.2. Perceived ease of use

In TAM, perceived ease of use (PEU) is defined as “the degree to which a person believes that using the system will be free from effort” [7,30]. In the online environment, perceived ease of use is about the perception of the ease of making purchases over the Internet. Therefore, in this study, perceived ease of use is defined as the extent to which a person believes that making purchases over the Internet (E-commerce) will be free from effort.

In technology acceptance research studies, perceived ease of use has been shown to have a positive effect on intention [8,30]. In the online environment, it is expected that perceived ease of use will positively influence consumers’ intention to adopt E-commerce. It is believed that

H2: Perceived ease of use will have a significant
positive effect on consumers’ E-commerce adoption intention.

For E-commerce, the translation of perceived ease of use into adoption intention may be moderated by product type. As discussed earlier in this paper, people tend to have more concerns and expectations about the ease of use when they purchase services rather than goods over the Internet; this is due to the inseparability of production and consumption of services. On the other hand, because the production and consumption of goods can be separated, online transactions for goods would be perceived as less complicated than that for services. Hence, when people purchase goods over the Internet, they tend to be less concerned about the ease of use of E-commerce. Thus, in the online environment, perceived ease of use plays a more important role in consumers’ purchase decision-making for services than for goods. As a result, the positive relationship between perceived ease of use and consumers’ E-commerce adoption intention will be more sensitive for services than goods. In other words, product type may magnify or moderate the positive relationship between perceived ease of use and consumers’ E-commerce adoption intention.

H2a: The positive relationship between perceived ease of use and consumers’ E-commerce adoption intention will be stronger when people purchase services rather than goods.

3.3. Perceived risk

Researchers in psychology and other disciplines have widely studied the risk theory. Raymond A. Bauer [1] introduced the notion of ‘perceived risk’ to consumer behavior research [28]. He suggested, “Consumer behavior involves risk in the sense that any action of a consumer will produce consequences that he cannot anticipate with anything approximating certainty, and some of which are likely to be unpleasant” [1].

Stone and Grønhaug [28], in their studies on perceived risk, showed the existence of an important difference between how the risk concept is introduced and adopted in consumer behavior research and how risk concept is conceived and used in other disciplines such as economics, psychology, statistical decision theory and game theory. They pointed out that, in other disciplines, “the concept of risk is related to choice situations involving both potentially positive and potentially negative outcome” [28,31] while in studying perceived risk in consumer behavior, however, “the focus has primarily been on potentially negative outcomes only” [28]. In the context of consumers’ E-commerce adoption behavior, when studying perceived risk, the focus is primarily on potentially negative outcome or potential losses/harm. Thus, in this study, perceived risk is defined as a person’s perception of the possibility of having negative outcome or suffering harm or losses associated with E-commerce.

The implicit uncertainty of using Internet technology in the online shopping environment has been acknowledged by researchers [27]. Perceived risk, as a conceptual construct of negative utility, has been explored by researchers in studying consumers’ E-commerce adoption behavior [10,21,27]. In the online environment, if consumers perceive huge potential losses/harm, i.e., if they perceive a high level of risk, it is likely that they will not intend to make purchases over the Internet. So, it is expected that perceived risk would negatively influence consumers’ intention to adopt E-commerce.

H3: Perceived risk will have a significant inverse effect on consumers’ E-commerce adoption intention.

In E-commerce, the translation of risk perception into E-commerce adoption intention may be moderated by product type. As discussed previously, consumers purchasing services online are involved in both the service production and consumption process. Given their involvement and likely ability to monitor and control these processes, the consumers would tend to have less fear of negative outcome and potential losses. As a result, the consumers of online services would tend to be less concerned about the risk involved. Conversely, when people purchase goods over the Internet, they tend to be more concerned about the risk involved. As the production and consumption of goods are separated, goods need to be delivered to consumers before they are consumed. This delay will create uncertainty, which may lead to concerns over negative outcome and potential losses. Thus, perceived risk plays a more important role in consumers’ purchase decision-making for goods than services. As a result, the inverse relation-
ship between perceived risk and consumers’ E-commerce adoption intention will be more sensitive for goods than services. In short, product type may magnify or moderate the inverse relationship between risk perception and consumers’ E-commerce adoption intention.

H3a: The inverse relationship between perceived risk and consumers’ E-commerce adoption intention will be stronger when people purchase goods rather than services.

Based on the above discussions, a theoretical model on consumers’ intention to adopt E-commerce is developed. It is shown in Fig. 1. Specifically, we propose that product type will moderate the perceived risk-intention, perceived ease of use-intention relationships.

4. Research design and methodology

The survey research method was used to collect data for testing our theoretical model.

4.1. Product type

Two products, namely, books (goods) and banking services (services), were chosen for this study since they are the most popular products over the Internet, as shown in the results of GVU’s WWW User Survey (source: Georgia Tech Research Corporation, USA). Internet bookstore is the specific online product business for books (goods) while Internet banking is the specific service business for banking services (services). Internet banking is defined as carrying out banking transactions over the Internet [21], including balance inquiry, account transfer, online bill payments and online investment.

GVU’s WWW User Survey could be found at http://www.gvu.gatech.edu/user_surveys (Source: Georgia Tech Research Corporation, USA).

4.2. Subjects

An experiential survey was conducted to validate the proposed model (Fig. 1). GVU’s WWW User Survey (source: Georgia Tech Research Corporation, USA) shows that a large group of Internet users are highly educated, holding college degrees. There are 62.4% of Internet users having college degree qualifications or some college education. GVU’s WWW User Survey also shows that the age group 21–25 has a large population among Internet users. As such, university students would be typical Internet users. Therefore, we chose university students as our survey subjects. The survey was administered to 308 university students from different faculties. All of the respondents were volunteers.

4.3. Constructs and questions

The constructs were developed based on existing tested questions/measures from prior research studies where possible. New questions were developed based on the marketing and information system literature if necessary. Questions pertaining to the constructs, perceived usefulness [24], perceived ease of use [30], perceived risk [4], and intention to adopt E-commerce [24], were measured on seven-point interval scales from strongly disagree (1) to strongly agree (7).

5. Data analyses and results

Partial least squares (PLS), a structural equation modeling technique, was used for data analysis in this study. PLS allows the simultaneous assessment of the measurement model (relationships between questions and constructs) within the context of the theoretical structural model (relationships among constructs) [11]. This technique is primarily intended for causal–predictive analysis in situations of low
theoretical information and is appropriate for the early stages of theory development [16]. Also, it does not require multivariate normal distribution or large sample sizes for its data [12]. Since this study was an early attempt to develop a theory on product differences in consumers’ E-commerce adoption behavior and the sample size available was not large, PLS was appropriate for this study. PLS-Graph Version 2.91 was used.

5.1. Evaluating the measurement model

Convergent and discriminant validity were assessed to establish the strength of the measurement model [15]. All constructs measured using multiple reflective questions were assessed for convergent and discriminant validity.

Convergent validity of a construct refers to the extent to which two or more attempts to measure the construct are consistent with one another [5]. Three tests were used to assess convergent validity: reliability of questions, composite reliability of constructs, and average variance extracted by constructs [13]. In addition, Cronbach’s $\alpha$ values [6] were used to establish the convergent validity of the constructs. Previous studies have suggested standard measurement for three tests. Hair et al. [15] recommended 0.5 as an indication of adequate reliability. Nunnally [26] proposed 0.8 as an indication of adequate composite reliability. Fornell and Larcker [13] suggested 0.5 as an indication of adequate variance extracted. Table 1 reveals that all constructs in this study have adequate convergent validity.

Discriminant validity refers to the extent to which measures of each construct are distinct from one another [3]. Two tests were used to assess discriminant validity. First, questions measuring each construct had to be loaded more highly on their intended construct than other constructs [29]. This was done by a factor analysis for all questions. Second, each question had to correlate more highly with other questions measuring the same construct than with other questions measuring other constructs. This was determined by comparing and seeing whether the variance extracted by each construct exceeded the shared variance between that construct and other constructs [13,14,17]. Tables 2 and 3 show that all of the constructs in this study have discriminant validity.

5.2. Evaluating the structural model

Given an adequate measurement model, the hypotheses could be tested by examining the structural model. The explanatory power of the structural model was assessed based on the amount of variance

<table>
<thead>
<tr>
<th>Construct</th>
<th>Questions</th>
<th>Reliability</th>
<th>Composite</th>
<th>Cronbach’s $\alpha$</th>
<th>Variance extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR (Perceived Risk)</td>
<td>PR1</td>
<td>0.8419</td>
<td>0.8965</td>
<td>0.8486</td>
<td>0.6848</td>
</tr>
<tr>
<td></td>
<td>PR2</td>
<td>0.7941</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PR3</td>
<td>0.7716</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PR4</td>
<td>0.8970</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU (Perceived Usefulness)</td>
<td>PU1</td>
<td>0.8607</td>
<td>0.8110</td>
<td>0.6583</td>
<td>0.5972</td>
</tr>
<tr>
<td></td>
<td>PU2</td>
<td>0.5530</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PU3</td>
<td>0.8632</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU (Perceived Ease of Use)</td>
<td>PEU1</td>
<td>0.6964</td>
<td>0.8952</td>
<td>0.8473</td>
<td>0.6828</td>
</tr>
<tr>
<td></td>
<td>PEU2</td>
<td>0.8361</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PEU3</td>
<td>0.8993</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PEU4</td>
<td>0.8594</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT (Intention to Adopt E-commerce)</td>
<td>INT1</td>
<td>0.8684</td>
<td>0.9209</td>
<td>0.8855</td>
<td>0.7444</td>
</tr>
<tr>
<td></td>
<td>INT2</td>
<td>0.8552</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INT3</td>
<td>0.8798</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>INT4</td>
<td>0.8473</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2
Results of factor analysis

<table>
<thead>
<tr>
<th>Question</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR1</td>
<td>-0.118</td>
<td>-0.122</td>
<td>0.833</td>
<td>-0.005</td>
</tr>
<tr>
<td>PR2</td>
<td>-0.061</td>
<td>0.020</td>
<td>0.840</td>
<td>-0.070</td>
</tr>
<tr>
<td>PR3</td>
<td>-0.099</td>
<td>0.083</td>
<td>0.768</td>
<td>-0.085</td>
</tr>
<tr>
<td>PR4</td>
<td>-0.239</td>
<td>-0.158</td>
<td>0.819</td>
<td>-0.020</td>
</tr>
<tr>
<td>PU1</td>
<td>0.362</td>
<td>0.232</td>
<td>-0.040</td>
<td>0.634</td>
</tr>
<tr>
<td>PU2</td>
<td>0.012</td>
<td>0.124</td>
<td>-0.095</td>
<td>0.755</td>
</tr>
<tr>
<td>PU3</td>
<td>0.271</td>
<td>0.217</td>
<td>-0.015</td>
<td>0.741</td>
</tr>
<tr>
<td>PEU1</td>
<td>0.201</td>
<td>0.692</td>
<td>-0.090</td>
<td>0.062</td>
</tr>
<tr>
<td>PEU2</td>
<td>0.169</td>
<td>0.788</td>
<td>-0.067</td>
<td>0.157</td>
</tr>
<tr>
<td>PEU3</td>
<td>0.041</td>
<td>0.892</td>
<td>-0.056</td>
<td>0.170</td>
</tr>
<tr>
<td>PEU4</td>
<td>0.083</td>
<td>0.816</td>
<td>-0.135</td>
<td>0.213</td>
</tr>
<tr>
<td>INTEN1</td>
<td>0.844</td>
<td>0.070</td>
<td>-0.204</td>
<td>0.104</td>
</tr>
<tr>
<td>INTEN2</td>
<td>0.833</td>
<td>0.177</td>
<td>-0.091</td>
<td>0.110</td>
</tr>
<tr>
<td>INTEN3</td>
<td>0.859</td>
<td>0.061</td>
<td>-0.123</td>
<td>0.161</td>
</tr>
<tr>
<td>INTEN4</td>
<td>0.752</td>
<td>0.233</td>
<td>-0.146</td>
<td>0.203</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>5.076</td>
<td>2.495</td>
<td>1.786</td>
<td>1.054</td>
</tr>
<tr>
<td>Variance extracted</td>
<td>33.841%</td>
<td>16.637%</td>
<td>11.908%</td>
<td>7.026%</td>
</tr>
<tr>
<td>Cumulative variance</td>
<td>33.841%</td>
<td>50.478%</td>
<td>62.386%</td>
<td>69.413%</td>
</tr>
</tbody>
</table>

in the endogenous construct for which the model could account. Our structural models for combined dataset, goods and services could explain 30.4, 20 and 52.6% of the variance of consumers’ intention to adopt E-commerce, respectively, which greatly exceeds the 10% suggested by Falk and Miller [9] as an indication of substantive explanatory power.

After computing parameter estimates for all paths in the structural model using the entire sample, PLS employed a bootstrap resampling technique [15] to obtain the corresponding T values for all paths (Table 4). Each Hypothesis (H1–H3) corresponded to a path in the structural model for the combined dataset (Fig. 2). Support for each hypothesis could be determined based on the sign (positive or negative) and statistical significance for its corresponding path [19]. The acceptable T value would be 2.326 with a significance level of 0.01.

**Table 3**
Shared variance (variance extracted) among constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>PR</th>
<th>PU</th>
<th>PEU</th>
<th>INT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR</td>
<td>(0.685)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>0.033</td>
<td>(0.597)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEU</td>
<td>0.026</td>
<td>0.205</td>
<td>(0.683)</td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>0.112</td>
<td>0.226</td>
<td>0.114</td>
<td>(0.744)</td>
</tr>
</tbody>
</table>

**Table 4**
Results of hypotheses test (note: *P < 0.01)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Structure Model for Goods</th>
<th>Structure Model for Services</th>
<th>Structure Model for Combined Datasets</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>3.6715*</td>
<td>4.9390*</td>
<td>6.8598*</td>
</tr>
<tr>
<td>H2</td>
<td>1.7982</td>
<td>3.0554*</td>
<td>2.4021*</td>
</tr>
<tr>
<td>H3</td>
<td>-4.4838*</td>
<td>-1.0895</td>
<td>-5.368*</td>
</tr>
</tbody>
</table>

Note: Hypotheses in **bold** were supported.

Fig. 2. Structural model for combined dataset.
Perceived usefulness had a significant positive effect on consumers’ intention to adopt E-commerce. Consumers who perceived a higher level of usefulness of E-commerce tended to be more willing to adopt it. Thus, H1 was supported. Perceived ease of use had a significant positive effect on consumers’ intention to adopt E-commerce. It was found that the higher level of perceived ease of use, the greater was the willingness of consumers to adopt E-commerce. Thus, H2 was supported. Perceived risk had a significant inverse effect on consumers’ intention to adopt E-commerce. Consumers who perceived a lower level of risk tended to be more willing to adopt E-commerce. Thus, H3 was supported.

Figs. 3 and 4 depict the structural models for goods and services, respectively. Hypotheses on product differences (H2a and H3a) could be tested by statistically comparing corresponding path coefficients in these structural models. H2a was tested by statistically comparing the path coefficient from perceived ease of use to intention to adopt E-commerce in the structural model for goods with the corresponding path coefficients in the structural models for services. H3a was tested by statistically comparing the path coefficient from perceived risk to intention to adopt E-commerce in the structural model for goods with the corresponding path coefficients in the structural models for services. These statistical comparisons were carried out using the procedure suggested by Wynne Chin presented in the research work of Mark Keil et al. [19].

Results showed that the path coefficient from perceived ease of use to intention to adopt E-commerce in the structural model for services was significantly stronger than the corresponding path coefficient in the structural model for goods ($t = 14.4418$, $P < 0.01$) (Fig. 5). As hypothesized, services yield a significantly stronger positive relationship between perceived ease of use and intention to adopt E-commerce than goods. Thus, H2a was supported.

Results showed that the path coefficient from perceived risk to intention to adopt E-commerce in the structural model for goods was significantly stronger than the corresponding path coefficient in the structural model for services ($t = 18.834$, $P < 0.01$). As hypothesized, goods yield a significantly stronger positive relationship between perceived risk and intention to adopt E-commerce than services. Thus, H3a was supported.
6. Discussions and implications

6.1. Discussion of findings

In this study, a theoretical model on consumers’ intention to adopt E-commerce has been formulated and empirically tested. The results reveal that perceived usefulness and perceived ease of use will positively influence consumers’ E-commerce adoption intention while perceived risk will negatively influence consumers’ E-commerce adoption intention.

Most importantly, product type has significant moderating effects on the relationship between perceived risk and consumers’ intention to adopt E-commerce, and the relationship between perceived ease of use and consumers’ intention to adopt E-commerce. The significant moderating effect of product type on the relationship between perceived risk and consumers’ E-commerce adoption intention shows that consumers’ intention to adopt E-commerce is influenced by perceived risk more strongly for goods than services. The significant moderating effect of product type on the relationship between perceived ease of use and consumers’ E-commerce adoption intention suggests that consumers’ intention to adopt E-commerce is influenced by perceived ease of use more strongly for services than goods.

Comparing different moderating effects of goods and services on consumers’ E-commerce adoption behavior, we could derive from the above discussions the following results. In product businesses (goods), the high level of perceived risk may be the main reason that consumers do not adopt E-commerce while in service businesses (services), the low level of perceived ease of use may be the major cause that consumers do not adopt E-commerce. Thus, in product businesses (goods), perceived risk should be given particular attention while in service businesses (services), perceived ease of use should be given particular attention. The implications of this observation for practitioners in product and service businesses are discussed in the following sections.

6.2. Implications for practitioners

6.2.1. Implications for product businesses

Given that goods are perceived to be intangible in the E-commerce environment, it is obvious that consumers would have to look for evidence of quality in means other than the physical inspection of the goods on offer. For this reason, they will draw inferences about the quality of goods from the presentation of websites. The task of the companies is therefore to ‘manage the evidence’ and ‘tangibilize the intangibility’ [23]. This suggests that for product businesses, companies should design more effective websites so as to improve the presentation of goods at the website and make the virtual experience of consumers more pleasant. At the same time, business processes and transactions should be designed to reduce the delay in delivery of goods to consumers in order to satisfy the consumers’ need to derive quicker satisfaction from the goods that they have purchased. By thus reducing the uncertainty that consumers may have about the goods and the online purchasing processes, businesses will be increasing consumers’ intention to adopt E-commerce.

Product businesses in the E-commerce environment would also do well to address the particular type of risk that consumers are likely to perceive with online purchases of goods. In general, consumers in the online environment will perceive different types of risk, namely, financial risk, social risk, time risk, physical risk, performance risk, psychological risk, privacy risk and security risk. But with goods, the risk that consumers tend to perceive is mostly likely linked to the uncertainty caused by the delay of delivery and the difficulty to predict the quality of goods. Consumers worry about whether they will get what they want. So with goods, performance risk would significantly influence consumers’ E-commerce adoption intention. To reduce the performance risk perceived by consumers, companies should have a well-designed return policy so that consumers may be assured that they could return the ordered products and get back their payments if they feel that they have not received what they want. At the same time, to reduce the performance risk perceived by consumers, the delay of delivery should be reduced.

Indeed, perceived risk plays a very important role in E-commerce. In order to get customers to transact or shop online, companies should pay more attention and allocate more resources to risk reduction activities.

6.2.2. Implications for service businesses

Consumers are involved in the production and
consumption of services due to the inseparability dimension of services. In the E-commerce environment, the implication of inseparability is complicated by the lack of social presence, i.e., the sellers of services are not available to consumers at the point in time when consumers are making their purchases. Thus consumers have to complete the transactions without any help from service providers. Consumers may therefore find it difficult to purchase services online, leading to a decrease in their intention to adopt E-commerce. In response, companies need to standardize their online transactions so as to make the transactions of services as simple as possible for consumers. At the same time, companies should also design more effective websites that offer clear and understandable help instructions so as to provide sufficient support to consumers for their completion of transactions and consumption of services. By boosting consumers’ perception of the ease of use of online services, businesses can increase consumers’ intention to adopt E-commerce.

6.3. Limitations of this study and implications for future research

As with any survey research work, we need to be cautious when generalizing the results of this study for several reasons. First, this study focuses on two specific products, namely, books (goods) and banking services (services), so attempts to generalize the results to other products (goods and services) should be done cautiously. Second, results obtained using student subjects may be somewhat different from results obtained using general consumers, who are the major group of E-commerce users. Future studies can extend the results of this study by investigating different product classes and different groups of consumers.

7. Conclusion

This study has made some novel contributions to the knowledge of consumers’ E-commerce adoption behavior. First, it investigates product type as a potential key to understanding the role of perceived ease of use in consumers’ E-commerce adoption decisions. It also reveals that product type makes a difference to the role of perceived risk as a determinant of E-commerce adoption behavior. Importantly, the differences that are linked to product type have great implications for practitioners in both product and service businesses. Second, the illustrations of the moderating impact of product type (a product factor) on consumers’ intention to adopt E-commerce add a product dimension to existing knowledge on consumers’ E-commerce adoption behavior. This has great implications for academic researches.

With advances in Internet technology and the increasing popularity of the Internet, E-commerce may become an important part of an individual’s life. Different effects of goods and services on consumers’ E-commerce adoption behavior suggest that companies in product businesses and service businesses should design different strategies in order to keep and get more customers in an increasingly competitive environment.

References


