

國立交通大學
交通運輸研究所

碩士論文

網路書店使用店配服務消費者之顧客忠誠度

Customer Loyalty of On-line Bookstores for

Consumers of Retailing Delivery Service



指導教授： 馮正民老師

黃昱凱老師

研究生： 葉怡珊

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研究生：葉怡珊

Student : Yi-Shan Yeh

指導教授：馮正民 博士
黃昱凱 博士

Advisor : Dr. Cheng-Min Feng
Dr. Yu-Kai Huang



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學生：葉怡珊

指導教授：馮正民 教授

黃昱凱 教授

國立交通大學交通運輸研究所碩士班

摘要

隨著電子商務的成長，博客來網路書店在2006年總營收為11.5億元，其成長率達65%，而金石堂網路書店的總營收則是7億元，成長率達100%，因此上網購書已經成為一個值得注意的市場。店配服務提供消費者一個安全的取貨方式，對於不方便使用宅配服務的消費者而言，是十分方便的，大約有90%以上的消費者上網購書後會選擇使用店配服務，因此上網購物，超商取貨是台灣網路書店最主要的物流模式。

本研究使用Rasch模式來修正網站服務品質以及店配物流服務品質量表，以使模式與資料的配適度良好，此外探討台灣主要網路書店，博客來與金石堂網路書店之網站服務品質、店配物流服務品質、知覺犧牲、服務價值、顧客滿意度、轉移成本與顧客忠誠度之間的關係，進而比較這兩家網路書店的路徑結果。

研究結果發現，博客來在網站服務品質以及物流服務品質對顧客忠誠度的影響不顯著，而金石堂則是轉移成本對於顧客忠誠度的影響不顯著，這樣的結果指出，雖然博客來與金石堂同為網路書店，但他們在性質上還是有很大的差異。最後，針對研究發現，為網路書店提出一些建議以提升他們的服務品質，進而增加市佔率。

關鍵字：電子商務，網路書店，店配，服務品質，RASCH，結構方程模式

CUSTOMER LOYALTY OF ON-LINE BOOKSTORES FOR CONSUMERS OF RETAILING DELIVERY SERVICE

Student : Yi-Shan Yeh

Advisors : Dr. Cheng-Min Feng

Dr. Yu-Kai Huang

Institute of Traffic and Transportation

National Chiao Tung University

ABSTRACT

Since electronic commerce has observed considerable growth, the growth rate of BOOKS.com was 65% in 2006 and the amount of business volume was NT \$1.15 billion. In addition, the amount of business volume of KingStone on-line bookstore was 0.7 billion with 100% increase. Ordering books on the Internet is obviously becoming a significant market. Retailing delivery (RD) service provides consumers with a self pick-up approach, so it is popular for those who cannot conveniently use home delivery service. Therefore, shopping on the Internet and picking-up at convenience stores is the major logistics model for on-line bookstores in Taiwan.

This study used Rasch Model to refine the questionnaire to let the model fit the data well. It also investigates the relationships among e-service quality, logistics service quality, perceived sacrifice, service value, customer satisfaction, switching costs, and customer loyalty of the two major on-line bookstores in Taiwan, BOOKS.com and KingStone. And compare results of these on-line bookstores to find out the differences between them.

The empirical results demonstrated that the effects of e-service quality and logistics service quality to customer loyalty of BOOKS.com sample and the effect of switching costs to customer loyalty of KingStone sample are not significant. These results reveal the distinguishing characteristic of these two on-line bookstores. Finally, provide some suggestions to the managers of on-line bookstores to increase the market share.

Keywords: E-commerce, On-line bookstores, Retailing Delivery, Service quality, Rasch Model, SEM

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CHAPTER 1 INTRODUCTION

1.1 Research Background and Motivation

After decades of technological development, the Internet is now rapidly reshaping industries and changing business models (Zwick, 2002). With increased usage of the World Wide Web (WWW), on-line shopping is becoming a new trading mode and preferred by consumers. Consumers just need to surf on the Internet, browse some information, and then compare the prices of different merchandise and retailers. Compared to brick-and-mortar environments, the Internet retailers have lower operation cost, and they also offer a more flexible and convenient way for consumers to shop. On-line shopping is now established as a major trend for suppliers and consumers.

With this growth in electronic commerce (e-commerce), there are more and more consumers ordering books from on-line bookstores in Taiwan. In contrast to traditional physical bookstores, many of which have gone bankrupt, the average growth rate of on-line bookstores is 80%. For example, the growth rate of BOOKS.com was 65% in 2006 and the amount of business volume was NT \$1.15 billion, while business volume of the KingStone on-line bookstore was 0.7 billion, an increased 100%. Because of the more convenient and cheaper shopping channels, ordering books on the Internet is clearly becoming a significant market.

The Internet has changed people's consumption habits (Hsu, 2007). As more and more consumers use Web channels, companies must focus on their e-services, including all cues and encounters that occur before, during, and after transaction (Parasuraman, Zeithaml and Malhotra, 2005). Managers of companies with a Web presence are recognizing the issue of service quality as strategically important (Slywotzky and Morrison, 2001). To deliver superior service quality, managers of companies with a Web presence must first understand how consumers perceive and evaluate online customer service (Parasuraman *et al.*, 2005).

The retailing delivery (RD) system provides an easy on-line shopping process, safe payment method and quick delivery service for e-retailing (Feng and Huang, 2006). The RD service also provides consumers with a self pick-up approach for delivery of merchandise, so it is popular for those who cannot conveniently use home

delivery service. Therefore, shopping on the Internet and picking-up at convenience stores is the major logistics model for on-line bookstores in Taiwan, and more than 90% of the customers who order books from on-line bookstores will choose the RD service for their logistics way. However, the BOOKS.com provides only 7-11.com service, and the KingStone on-line bookstore provides CVS.com service which includes three families of convenience stores (Family.com, Hi-Life.com, and OKcvs.com). The retailing delivery (RD) service is very important for on-line bookstores, but these two major on-line bookstores have different RD systems. For this reason, to find out the relationship between logistics service quality and customer loyalty is an important issue for managers of on-line bookstores.

Recently, many researchers thought that the existence of switching costs may cause customers to be not loyal who are satisfied with the service, and the loyal customers may be not satisfied with the service. This study aims to use SEM to understand the relationship between website service quality, logistics service quality, switching cost and customer loyalty. It is important to understand the crucial factors in a choice of on-line bookstores for customers since this can help managers to develop strategies to increase their market share.

1.2 Research Objective

Based on the research background mentioned above, there are several objectives of this study:

1. Develop the website service quality and retailing delivery logistics service quality scales for on-line bookstores, and use Rasch model to refine the scales.
2. Use structure equation model (SEM) to investigate the relationship among e-service quality, logistics service quality, perceived sacrifice, service value, customer satisfaction, switching costs and customer loyalty.
3. Confirm the relationships among the research constructs of BOOKS.com and KingStone, and find out the differences between them.
4. Use Importance-Performance Analysis (IPA) to discuss the relations of level of customers' expected service quality (importance) and level of customers' perceived service quality (performance).
5. Provide suggestions on developing strategies for the managers of on-line bookstores to increase their market share.

1.3 Research Scope

This study is focus on Business to Customer (B2C) business model. And the purpose is to find out the crucial factors that will influence customer loyalty from customers' viewpoint.

The major research subjects of this study are the main on-line bookstores in Taiwan, BOOKS.com and KingStone on-line bookstore. To understand the opinion of customers, an on-line survey will be administered to the customers of on-line bookstores.

The research scope of this study is shown in Figure 1.1.

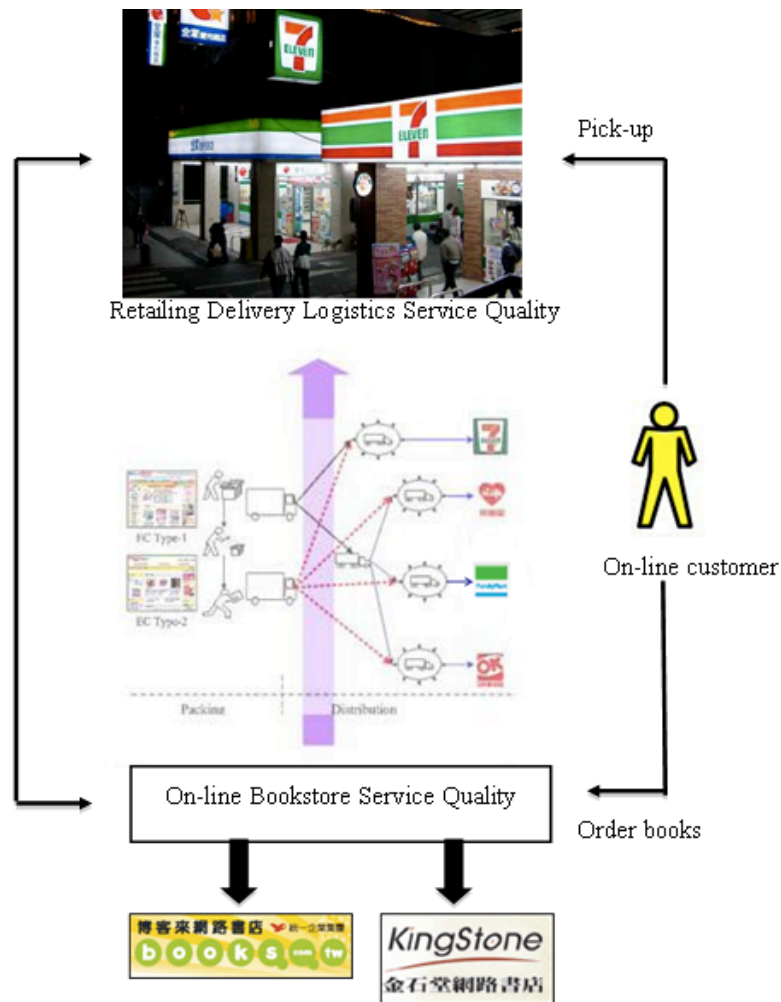


Figure 1.1 Research Scope

1.4 Research Procedure

The research procedure of this study is shown in Figure 1.2.

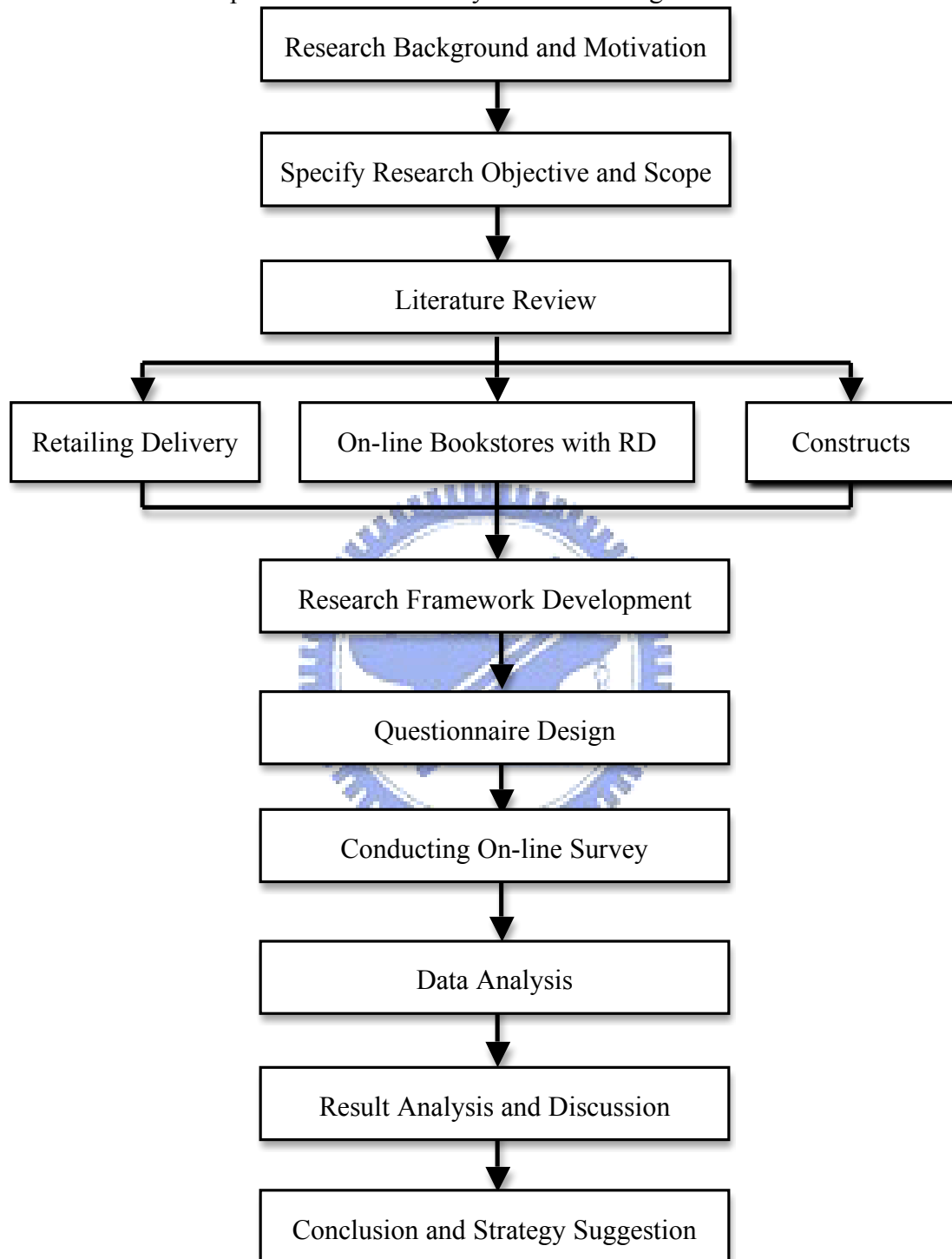


Figure 1.2 Research Procedure

Chapter1 outlines the research background, motivations, objectives and scope. The remaining of this study is organized as follows: Chapter2 describes some background about on-line bookstore and retailing delivery (RD), in addition, it also introduces the previous literature related to service quality, service value, customer satisfaction, switching costs, customer loyalty. Chapter3 presents the research framework and introduces the research methodology. Chapter4 includes the descriptive results of measurement variables and the results of data analysis. Chapter 5 is a summary of the crucial findings and contributions of this study, moreover it also discusses some limitations of this research.



CHAPTER 2 LITERATURE REVIEW

2.1 Retailing Delivery

Feng and Huang (2006) described that in the B2C environment, reliable and timely delivery are fundamental objectives for on-line shoppers. In Taiwan, there are many convenience stores, and the retailing delivery (RD) services form a new retail delivery model: “Shopping on the Internet and picking up the merchandise at convenience stores.” The retailing delivery services have made many remarkable successes.

In Taiwan, RD has been combined with e-commerce for about eight years, and it is operated by 3PL. The 3PL providers have had to improve the flow of information both internally and externally and integrate their logistics services into the retail delivery provided by convenience stores.

CVS.com (a joint venture by three families of convenience stores including Family.com, Hi-Life.com, and Okcvs.com) is an RD provider that began service in the beginning of 1999, and 7-11.com joined this market at the end of 2000. Because of its safe payment method and quick delivery, RD services by convenience stores have played an important role of the e-commerce logistics in Taiwan. The relationship of distribution centre of retailing delivery is shown in Figure 2.1.

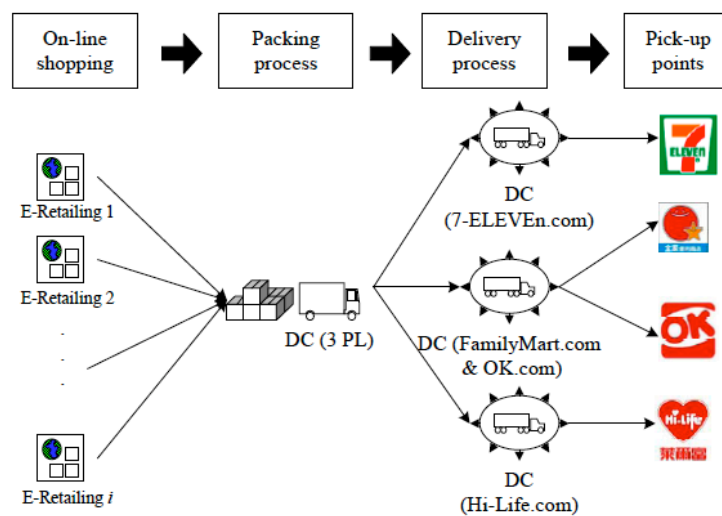


Figure 2.1 Relationship of Distribution Centre of RD
Source: Feng and Huang (2006)

The RD system provides an easy on-line shopping process, a safe payment method, convenient pick-up points and quick delivery service for E-retailing. The RD system has two specific characteristics: consumers can shop on-line even without a credit card, and it provides consumers with a self pick-up approach through convenience stores. Figure 2.2 show the details about the goods flow and information flow of retailing delivery.

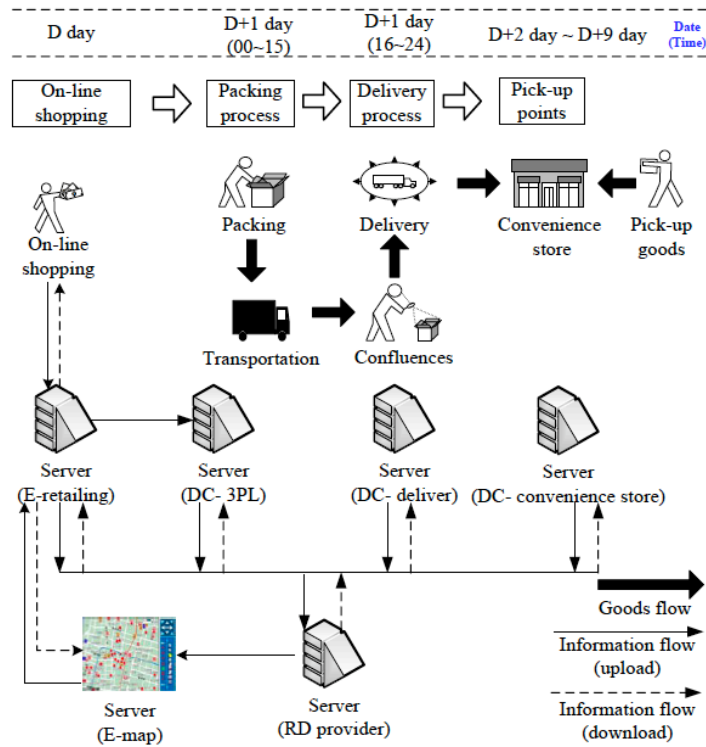


Figure 2.2 Details About the Goods Flow and Information Flow of RD

Source: Feng and Huang (2006)

Step 1 (D day): An on-line shopper chooses a convenience store to pay the money and pick-up the merchandise via the e-map website.

Step 2 (D+1 day): The E-retailer uploads the order information to 3PL. Then 3PL must finish the packing process of all orders by 3:00 pm of the D+1 day and transport the orders to the delivery centre before 4:00 pm of the D+1 day.

Step 3 (D+1 day): The delivery centre collects the orders from different e-retailers and transports the orders to the different convenience stores before 12:00 noon on the afternoon of the D+2 day.

Step 4 (D+2 day): According to the information uploaded from the convenience store delivery centre, the E-retailer will notify the customer by e-mail or cell phone about pick-up.

Step 5 (D+2 day~D+9 day): If on-line shopper picks up the goods from the convenience store, the e-retailer can download the data from the server of RD provider. If not, the RD provider will return the goods to the e-retailer after the D+9 day.

2.2 On-line Bookstore with RD

Most on-line bookstores in Taiwan provide both home delivery and retailing delivery service. Compared to home delivery, retailing delivery service provides consumers a safe payment way, and consumers can pick up their goods whenever they are free within seven days. Therefore, “ordering books on the Internet and picking-up at convenience stores” is the major logistics model of on-line bookstores in Taiwan.

There are two RD providers in Taiwan, and on-line bookstores such as BOOKS.com and Yuan-Liou provide 7-11.com service, and others such as KingStone, ESLITE, San-Min, and Silkbook provide CVS.com service. BOOKS.com was the first on-line bookstore in Taiwan and it also was the first to provide retailing delivery service, beginning in 2000. KingStone online bookstore was set up in 1997, and it began to provide retailing delivery service later.

The procedure that combines on-line bookstores (E-Retailing) with RD system is illustrated below:

1. On-line shopping

After making an on-line purchase, customers must choose a delivery method to receive their orders. Some sites decide the delivery method (home delivery and retailing delivery) according to the typed of goods, while others allow consumers to decide the delivery method. The major on-line bookstores in Taiwan let customers choose between home delivery and retailing delivery service. In general, most customers of on-line bookstores will choose RD service to get their books.

2. Select the pick-up point

When customers choose to use retailing delivery system, the 7-11.com or the CVS.com will appear, and customers should select the pick-up point on the e-map provided by RD system.

3. Packing process

After the on-line bookstore confirms the orders, it turns over the order for goods to 3PL, and 3PL should help finish the packing process and transport the orders to the delivery centre for the convenience store which is chosen.

4. Delivery process

The delivery centre will collect the orders and transport them to different convenience stores, which are the pick-up points, and then it will report the finished order information to the on-line bookstore.

5. Pick-up goods

According to the information replied from delivery centre, the on-line bookstores will notify the customer by e-mail or cell phone message to pick-up their orders.

Generally speaking, consumers order goods on D day, and on the D+1 day 3PL will proceed to pack, and consumers can pick up their orders from the convenience store on the afternoon of the D+2 day.

2.3 Service Quality

2.3.1 Traditional Service Quality

A service is an activity or series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between the customer and the service employee and / or physical resources or goods and / or systems of the service provider, which are provided as solutions to customers problems (Gronroos, 1990). According to Parasuraman, Zeithaml and Berry (1985), there are four distinguishing characteristics of service: intangibility, inseparability, perish ability, and heterogeneity (variability):

Intangibility: Services are performances rather than objects, they cannot be seen, tested, felt, heard, or smelled before purchase.

Inseparability: Services cannot be separated from their providers.

Perish Ability: Services cannot be stored and carried forward to a future time period.

Heterogeneity: Quality of services often vary from producer to producer, from customer to customer, and from day to day.

Parasuraman, Zeithaml and Berry (1985) proposed that service quality is a function of the difference between consumer expectations and actual service performance. They developed a model for service quality by an exploratory investigation of quality in four service businesses. This model is based on the gaps

between consumers and marketers, and it is widely called “PZB model” or “GAP model”. In this study, ten dimensions about service quality were introduced, and then refined into five key dimensions names SERVQUAL in 1988 for measuring customers’ subjective perception of service quality (Table 2.1).

Table 2.1 Refined PZB Model

Original PZB Model (1985)	Refined PZB Model (1988)	Definition
Tangibles	Tangibles	Appearance of physical facilities, equipment, personnel, and communication materials.
Reliability	Reliability	Ability to perform the promised service dependably and accurately.
Responsiveness	Responsiveness	Willingness to help customers and provide prompt service.
Communication		
Credibility	Assurance	Knowledge and courtesy of employees and their ability to convey trust and confidence.
Security		
Competence		
Courtesy		
Understanding	Empathy	The firm provides care and individualized attention to its customers.
Access		

The SERVQUAL model has been criticized by some researchers because of the difficulty in replicating its dimensions. In addition, Cronin and Taylor (1992) suggested that expectations were not necessary in the measurement of service quality, thus conceptualizing their own model, called SERVPERF. There are more and more researches start to show more and more support for the exclusion of expectations in measuring service quality (Brady and Cronin, 2001; Dabholkar, Shepherd, and Thorpe, 2000; Mentzer, Flint, and Hult, 2001). The theoretical background of service quality is moving from expectancy disconfirmation to the theory of reasoned action (Collier and Bienstock, 2006). The theory of reasoned action states that individuals’ behavior can be predicted from their attitudes about the behavior and subjective norms (Ajzen and Fishbein, 1980).

2.3.2 E-Service Quality

As the Internet has remained a crucial channel for selling most types of merchandise and services, the issue of understanding electronic services has recently

received considerable attention in academic research. Rust and Lemon (2001) described Electronic service (E-Service) as “providing a superior experience to consumers with respect to the interactive flow of information”. Accordingly, on-line service can be divided into a functional dimension (what is delivered in term of service outcome) and a technical dimension (how is it delivered in term of service process), Grönroos *et al.* (2000) provided a definition of NetOffer model. Many researchers thought that the definition of e-service should include all cues and encounters that occur before, during and after the electronic service delivery (Zeithaml *et al.*, 2002; Parasuraman *et al.*, 2005).

E-Ratings, a section of a well-known magazine for rating the quality of products and services, Consumer Reports evaluates the quality of service provided on a website. There are three criteria that E-Ratings use to evaluate a website: credibility, usability and content. Similarly, BizRate.com creates a measurement based on ten dimensions to evaluate e-service quality. The “Webby Awards” from the International Academy of Digital Arts and Science also has their own criteria for evaluating the quality of a website. Final, the award for website quality given by Worldbestwebsites.com evaluates quality by five criteria. The details are shown in Table 2.2.

The five dimensions in SERVQUAL and SERVPERF models can measure service quality well in off-line environments, however, on-line services have unique characteristics that should be contained, for example, connectivity and server problems (Collier and Bienstock, 2006). There are more and more researches focus on e-service quality recently. The first definition of e-service quality is that service quality on the Internet is the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery of products and services (Zeithaml, Parasuraman, and Malhotra, 2000).

Loiacono, Watson, and Goodhue (2000) developed WebQual, a scale with 12 dimensions to improve the service quality of websites. However, this study generated information for website designers, rather than measuring service quality, so WebQual may be insufficient. Yoo and Donthu (2001) developed a scale called SITEQUAL to measure site quality on four dimensions. Since the data for developing and testing SITEQUAL were gathered from students who did not have to complete the purchasing process, it does not constitute a comprehensive assessment of a site’s service quality. By using an on-line survey, Wolfinbarger and Gilly (2003) developed a scale called eTailQ. This scale of e-service quality has four dimensions: Website design, reliability/fulfillment, privacy/security, and customer service.

Table 2.2 Practitioner Dimensions of E-Service Quality

Source: Collier and Bienstock (2006)

Website	Dimensions of E-Service Quality	
E-Ratings (www.consumerreports.org)	Credibility: privacy, security, customer service, and disclosure Usability: design and navigation in the website Content: accurate product information, personalization , and depth of categories	
Bizrate.com (www.bizrate.com)	Ease of ordering Product selection Price Website performance Product representation	Privacy policies Customer support Shipping and handling Production information On-time delivery
Webby Awards (www.webbyawards.com)	Content Structure and navigation Visual design	Functionality Interactivity Overall experience
World's Best Websites (www.worldbestwebsites.com)	Functionality: accessibility, speed and bandwidth sensitivity, HTML quality, navigation and links, and legality Design: graphic design, user friendliness, aesthetics, alignment, layout, and integration Content: purpose, human interactivity, information process, verbal expression, and attention to detail Originality: creativity, distinctiveness, and vision Professionalism: customer service, values, and focus on message Professionalism: customer service, values, and focus of message	

Furthermore, Zeithaml, Parasuraman, and Malhotra (2000, 2002) developed e-SERVQUAL for measuring e-service quality with seven dimensions, and they also split the dimensions into two separate scales in 2005. One of the scales is the core dimensions: efficiency, system availability, fulfillment, and privacy, which is named E-S-QUAL. The other scale is E-RecS-QUAL, responsiveness, compensation, and contact, focused on the recovery part. They thought that in on-line environments, gaps will exist between service expectations and perceptions, similar to the PZB model:

Information gap: The difference between customers' requirements concerning a website and management's beliefs about the requirements.

Design gap: The failure to fully incorporate knowledge about customer requirements into the structure and functioning of the website.

Communication gap: A lack of accurate understanding on the part of marketing personnel about a website's features, capabilities, and limitations.

Fulfillment gap: The overall discrepancy between a customer's requirements and experiences, and it is the only one occurring on the customer side. The overall fulfillment gap stems from a combination of the information, design, and communication gaps.

Collier and Bienstock (2006) measured service quality in E-Retailing and they developed a conceptual framework of e-service quality. This research focused not only on website interactivity or process quality but also on outcome quality and recovery quality. It consisted of three second-order dimensions and eleven first-order dimensions: privacy, design, information accuracy, ease of use, functionality, order timeliness, order accuracy, order condition, interactive fairness, procedural, and outcome fairness. In order to integrate both utilitarian and hedonic e-service quality elements, Bauer, Falk, and Hammerschmidt (2006) developed a transaction process-based scale for measuring service quality (eTransQual). The five dimensions in eTransQual are functional/design, enjoyment, process, reliability and responsiveness. The details are shown below (Table 2.3).

Table 2.3 Academic Dimensions of E-Service Quality

Study	Dimensions	Sample
WebQual (Loiacono, Watson, and Goodhue, 2000)	Information fit to task, Trust, Design, Visual appeal, Flow, Business process, Interaction, Response time, Intuitiveness, Innovativeness, Integrated communication, Substitutability	Students
SITEQUAL (Yoo and Donthu , 2001)	Ease of use, Aesthetic design, Processing speed, Interactive responsiveness	Students
eTailQ (Wolfenbarger and Gilly, 2003)	Website design, Reliability, Customer service, Privacy	Members of Harris Poll On-line Panel
E-S-QUAL and E-RecS-Qual (Zeithaml, Parasuraman, and Malhotra, 2000, 2002, 2005)	Core- Efficiency, System availability, Fulfillment, Privacy Recovery- Responsiveness, Compensation, Contact	On-line Customers of Amazon/ Walmart

Study	Dimensions	Sample
E-Service Quality (Collier and Bienstock, 2006)	<p>Process quality- Ease of use, Privacy, Design, Information accuracy, Functionality</p> <p>Outcome quality- Order timeliness, Order accuracy, Order condition</p> <p>Recovery- Interactive fairness, Procedural fairness, Outcome fairness</p>	Students
eTransQual (Bauer, Falk, and Hammerschmidt, 2006)	Functional/Design, Enjoyment, Process, Reliability, Responsiveness	On-line shopper

2.3.3 Logistics Service Quality

Logistics has been considered an aspect of service with which firms can create competitive advantage (Mentzer and Williams, 2001). Logistics service quality is a key factor of marketing, and it can create customer satisfaction. The “Seven Rs” describe the attributes that a company can offer products and services and create utility through logistics service. In other words, part of a product’s marketing offering is the company’s ability to deliver the right amount of right product at the right place at the right time in right condition at the right price with the right information (Mentzer, Flint, and Kent, 1999).

Unlike traditional logistics studies, logistics service studies not only include cycle time, on-time delivery, and inventory availability, but also any handling of individual customer requests beyond traditional service measures (Davis and Mentzer, 2006).

Mentzer, Flint, and Hult’s (2001) research in logistics service quality states that service quality perceptions are based on the dimensions of order placement and order receipt, and that is a concept of procedure. Furthermore, the authors provided nine concepts to evaluate logistics service quality (Table 2.4).

Table 2.4 Definitions of the Nine Concepts About LSQ

Source: Mentzer *et al.* (2001)

Logistics Service Quality	Definitions
Personnel contact quality	The customer orientation of the supplier's logistics contact people. Customers care about whether customer service personnel are knowledgeable, empathize with their situation, and help them resolve their problems.
Order release quantities	Product availability. Customers should be the most satisfied when they are able to obtain the quantities they desire.
Information quality	Customers' perceptions of the information provided by the supplier regarding products from which customers may choose.
Ordering procedures	The efficiency and effectiveness of the procedures followed by the supplier.
Order Accuracy	How closely shipments match customers' orders upon arrival.
Order condition	The lack of damage to orders.
Order quality	How well products work, includes how well they conform to product specifications and customers' need.
Order discrepancy handling	How well firms address any discrepancies in orders after the orders arrive.
Timeliness	Whether orders arrive at the customer location when promised. The length of time between order placement and receipt.

Most foreign and Taiwan logistics studies about e-retailing have all focused on home delivery, and develop the scale for measuring home delivery logistics service quality (Mentzer *et al.*, 2001, Collier and Bienstock, 2006). Recently, Feng and Huang (2003, 2006) aimed at retailing delivery and used AHP and SEM to analyze consumer behavior intention about on-line shopping. They measured logistics service quality on retailing delivery service for on-line shopping by five dimensions: information quality, ordering procedures, timeliness, order condition and discrepancy handling.

2.4 Perceived Sacrifice

Sacrifice is defined as what is given up or sacrificed to acquire a service/product (Zeithaml, 1988). The measured scale of the sacrifice can be described as the consumers' perceptions of the monetary and the non-monetary price when they acquire a service/product. The monetary price is evaluated by a direct measure of the dollar price of the service, and non-monetary price is evaluated by direct measures of time and effort of the service (Cronin, Bredy, and Hult, 2000).

Because risk is an inherent part of the cost of the acquisition and use of any service or product, sacrifice is described as a composite of perceived monetary price, perceived non-monetary price, and perceived risk (Cronon *et al.*, 1997).

2.5 Service Value

Zeithaml (1988) described that perceived value is conceptualized as the consumer's overall assessment of the utility of a product based on perceived of what is received and what is given. She also identified four unique definitions of the value construct by an exploratory investigation: (1) Value is low price, (2) Value is whatever I want in a product, (3) Value is equality I get for the price I pay, (4) Value is what I get for what I give. Overall, value is a trade-off between get (benefits) and give up (sacrifices) something, no matter what is given and what is received vary across consumers.

Zeithaml (1988) argued that perceived quality is directly associated with perceived value. Bolton and Drew (1991) extended Zeithaml's (1988) concept of perceived value and defined it as a function of service quality, sacrifice, and customer characteristics. The customers' perceived value differs from each other because the monetary and nonmonetary, and their preference and past experiences. Generally, service value may be defined as (Cronon *et al.*, 1997):

$$ServiceValue = f(ServiceQuality, Sacrifice)$$

Sweeney, Soutar, and Johnson (1999) extended previous research and developed a model of perceived value. The empirical results confirmed that perceived product, service quality, and perceived risk lead to perceived value in a service encounter. Therefore, the hypotheses of this study are developed:

H1: Perceived service quality will impact the perceived service value.

H1a: E-service quality will impact the perceived service value.

H1b: Logistics service quality will impact the perceived service value.

H2: Perceived sacrifice will impact the perceived service value.

2.6 Customer Satisfaction

The performance of a company leads to customer satisfaction with a product or service (Innis and Londe, 1994). Cardozo (1965) thought customer satisfaction may lead to repeat purchases, accept other products in the same product, and give favorable recommendation. Fornell (1992) also described that customer satisfaction can increase customer loyalty and decrease customer churn, reduce the costs of failing marketing and of new customer creation, improve the effectiveness of advertising, and enhance business reputation. Satisfaction is described as “an evaluation of an emotion” (Hunt, 1977).

Satisfaction is associated with fulfilled performance expectations (Swan and Combs, 1976), and there are several definitions for customer satisfaction. Oliver (1980) stated that customer satisfaction is a function of expectations and performance, and furthermore, he described that it is not only from the disconfirmation of measurement but also from the emotions of purchasing experience (1981). Fornell (1992) thought that performance is more important than expectation. Customer satisfaction generally means customer reaction to the state of fulfillment, and customer judgment of the fulfilled state (Oliver, 1997). Overall, customer satisfaction is a person’s feelings of pleasure or disappointment resulting from the comparison between perceived and expected product performance.

It is always existed two viewpoints of evaluating customer satisfaction: transaction-specific (multiple items scale) and cumulative (overall satisfaction). While transaction-specific satisfaction is identified as a post-choice evaluative judgment of a specific purchase occasion (Oliver, 1980), cumulative satisfaction is an overall evaluation of the firm’s past, current, and future performance (Oliver, 1996; Rust and Oliver 1994).

Fornell *et al.* (1996) introduced the American Customers Satisfaction Index (ACSI) model, and the empirical results showed that service quality and service value are antecedents of overall customer satisfaction. Therefore, the hypotheses of this study are developed:

H3: Perceived service quality will impact the customer satisfaction.

H3a: E-service quality will impact the customer satisfaction.

H3b: Logistics service quality will impact the customer satisfaction.

H4: Perceived service value will impact the customer satisfaction.

2.7 Switching Costs

Switching costs can be defined as the costs involved in changing from one provider to another (Heide and Weiss, 1995). When consumers decide to change the provider, they may consider if it is worth changing. The impediments of changing provider include “search costs, transaction costs, learning costs, loyal customer discounts, customer habit, emotional costs and cognitive effort, coupled with financial, social, and psychological risks on the part of the buyer” (Fornell, 1992). Therefore, when the switching costs are high for customers, they are more likely to choose to remain with their existing provider.

Burnham, Frels, and Mahajan (2003) collected number of researches and generalized eight distinct switching costs facets:

1. *Economic risk costs* (Guiltinan, 1989; Jackson, 1985; Klemperer, 1995; Samuelson and Zecjhauser, 1988)

2. *Evaluation costs* (Samuelson and Zecjhauser, 1988; Shugan, 1980)

3. *Learning costs* (Alba and Hutchinson, 1987; Eliashberg and Robertson, 1988; Guiltinan, 1989; Wernerfelt, 1985)

4. *Setup costs* (Guiltinan, 1989; Klemperer, 1995)

5. *Benefit loss costs* (Guiltinan, 1989)

6. *Monetary loss costs* (Heide and Weiss, 1995; Jackson, 1985; Klemperer, 1995; Porter, 1980; Weiss and Heide, 1993)

7. *Personal relationship loss costs* (Guiltinan, 1989; Klemperer, 1995; Porter, 1980)

8. *Brand relationship loss costs* (Aaker, 1992; Porter, 1980)

Burnham *et al.* (2003) investigated the relationships between the eight switching cost facets and organized them into three higher-order types of switching

cost: procedural switching costs, financial switching costs, and relational switching costs (see Figure 2.3). The definition of the three types of switching cost is shown in Table 2.5. And more simply, switching costs can be separated into financial and non-financial switching costs.

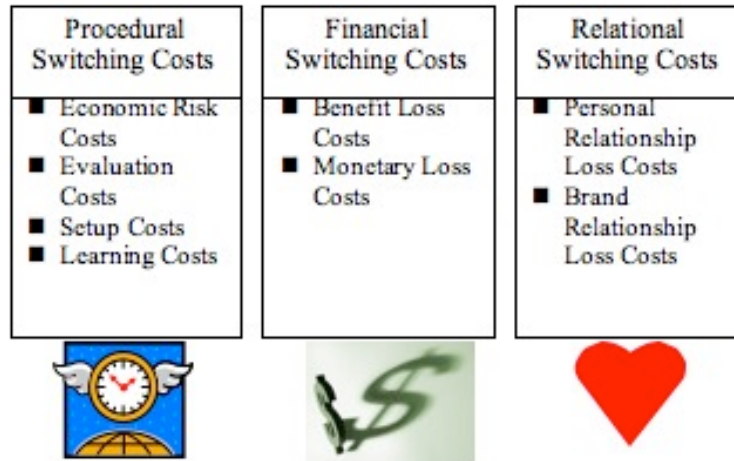


Figure 2.3 Switching Costs Typology

Source: Burnham *et al.* (2003)

Table 2.5 Definition of the Three Types of Switching Cost

Switching Costs	Definitions
Procedural switching costs	The costs that involves the expenditure of time and effort.
Financial switching costs	The costs that involves the loss of financially quantifiable resources.
Relational switching costs	The costs that involves psychological or emotional discomfort due the loss of identity and the breaking of bonds.

2.8 Customer Loyalty

Customer loyalty is described as a consumer’s overall attachment or deep commitment to a product, service, brand, or organization (Oliver, 1999). The difference between customer loyalty and behavior intention is that customer loyalty has with a focus on repeat purchasing.

Oliver (1997) developed a framework for loyalty and separated loyalty into four distinct, sequential phases. Harris and Goode (2004) collected and analyzed data from two surveys of on-line customers and the results supported the contention that there are four sequential levels of loyalty:

Cognitive loyalty (1st level): It refers to the existence of beliefs that a brand is preferable to others, and it is also called “loyalty based on brand belief”.

Affective loyalty (2nd level): It reflects a favorable attitude or liking based on satisfied.

Conative loyalty (3rd level): It constitutes the development of behavioral intentions characterized by a deeper level of commitment.

Action loyalty (4th level): It relates to the conversion of intentions to action, accompanied by a willingness to overcome impediments to such action.

It is generally accepted that loyalty consists of two dimensions: attitudinal and behavioral loyalties (Koo, 2006). The attitudinal loyalty dimension is measured by psychological commitment to the target object, and the behavioral loyalty is measured as a proportion of purchase of a specific brand (Caruana, 2002).

Zeithaml *et al.* (1996) argued that superior service quality leads to favorable behavioral intentions. Cronin *et al.* (2000) described an empirical assessment of the effects of quality, satisfaction, and value on consumers' behavioral intentions in six service industries. They reviewed the literature, and presented three competing models based on different research objectives (Figure 2.4). The first model called “Value Model” is based on the service value literature, where value is suggested to lead directly to favorable behavioral outcomes. The second one is “Satisfaction Model” which is derived from the satisfaction literature and defines customer satisfaction as the major and direct determinant of behavioral intentions. The third model called “Indirect Model” is come from the literature on relationships between service quality, satisfaction, and behavioral intentions. This model shows that the relationship between service quality and behavioral intention is indirect.

In order to get a more pragmatic understanding of the relationships among service quality, service value, customer satisfaction, and behavioral intentions, Cronin *et al.* (2000) developed the fourth model called “Research Model”. They found that service quality, service value, and satisfaction are directly associated with behavioral intention. In addition, service quality and service value are indirectly related to behavioral intentions (i.e., $SQ \rightarrow SV \rightarrow BI$, $SQ \rightarrow SAT \rightarrow BI$, and $(SV \rightarrow SAT \rightarrow BI)$).

Brady, Knight, Cronin, Tomas, Hult, and Keillor (2005) identified four service evaluation models that are generally used to depict the antecedents to behavioral intentions. The four models include Value Model, Service Quality Model, Satisfaction Model, and Comprehensive Model (Figure 2.5). These models

are somewhat different from the models described in 2000. Brady *et al.* tested these models by multinational and multi-industry samples, and the result showed that the comprehensive model best captures the identified relationships.

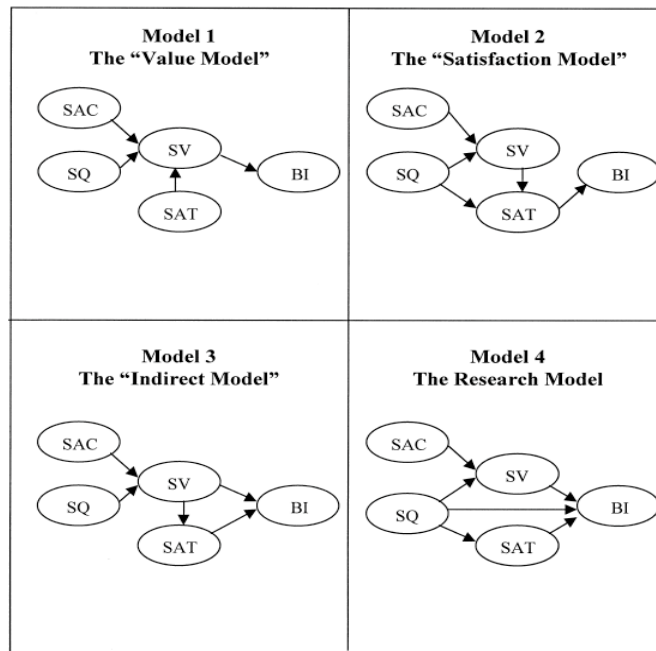


Figure 2.4 Four competing models
Source: Cronin *et al.* (2000)

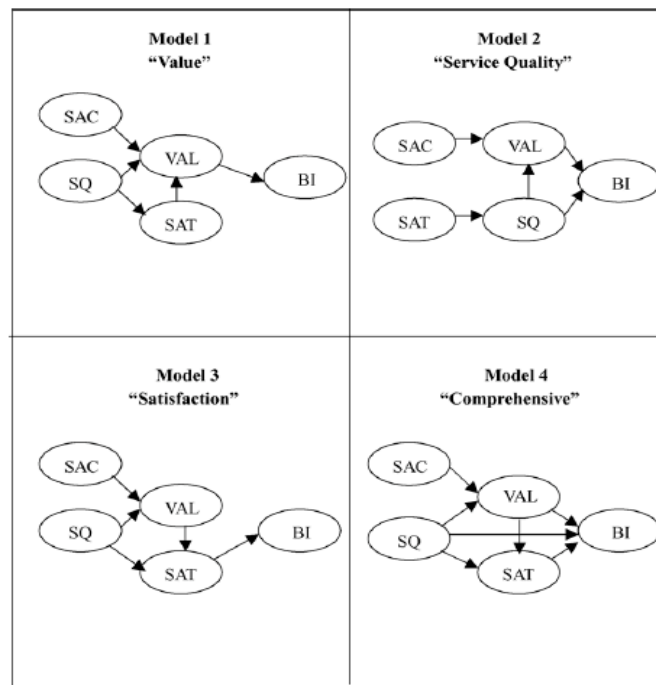


Figure 2.5 Four Service Evaluation Models
Source: Brady *et al.* (2005)

Harris and Goode (2004) also developed a framework of service quality, trust, value, satisfaction, and loyalty, and tested this model by surveying customers in two on-line markets, Books.com and Flights.com. Their research supported associations between service quality and value, service quality and satisfaction, value and loyalty, and satisfaction and loyalty.

The hypotheses of this study are developed:

H5: Perceived service quality will impact the customer loyalty.

H5a: E-service quality will impact the customer loyalty.

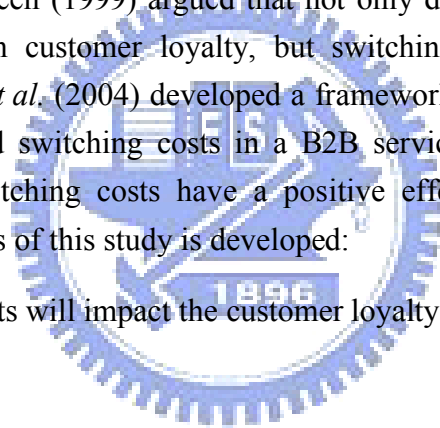
H5b: Logistics service quality will impact the customer loyalty.

H6: Perceived service value will impact the customer loyalty.

H7: Customer satisfaction will impact the customer loyalty.

Methlie and Nysveen (1999) argued that not only does customer satisfaction have a great impact on customer loyalty, but switching costs may also affect customer loyalty. Lam *et al.* (2004) developed a framework linking customer value, satisfaction, loyalty, and switching costs in a B2B service setting. The empirical results showed that switching costs have a positive effect on customer loyalty. Therefore, the hypothesis of this study is developed:

H8: Switching costs will impact the customer loyalty.



CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

This chapter first introduces the conceptual framework and hypotheses to be tested in this research. Then the construct measurements of research constructs, including e-service quality, logistics service quality, perceived sacrifice, service value, customer satisfaction, switching costs and customer loyalty are presented. Finally, the research methods, including questionnaire development, sampling plan, data collection, and data analysis techniques are described.

3.1 Conceptual Framework

According to research background and motivation, the purposes of this study are to integrate relevant literature and to develop a comprehensive research framework to identify the relationships among key constructs. Figure 3.1 shows the conceptual framework of this study.

The literature review in chapter two shows that all of the research constructs such as service quality, perceived sacrifice, service value, customer satisfaction, switching costs, and customer loyalty have direct effects on each other. This study first divided service quality of on-line bookstores into two parts, e-service quality about the websites (on-line bookstores) and logistics service quality about retailing delivery (RD) service. The comprehensive model of four service evaluation models proposed by Brady *et al.* (2005) is used to depict the antecedents to customer loyalty. Furthermore, switching costs is also a critical antecedent to customer loyalty. If a customer is not satisfied with one on-line bookstore, and the costs of switching to another on-line bookstore are low, the customer will not be loyal. In other words, if the switching costs are high, the unsatisfied customer may not change to other on-line bookstores, but will remain loyal to the original on-line bookstore. Therefore, switching costs are added to the research model.

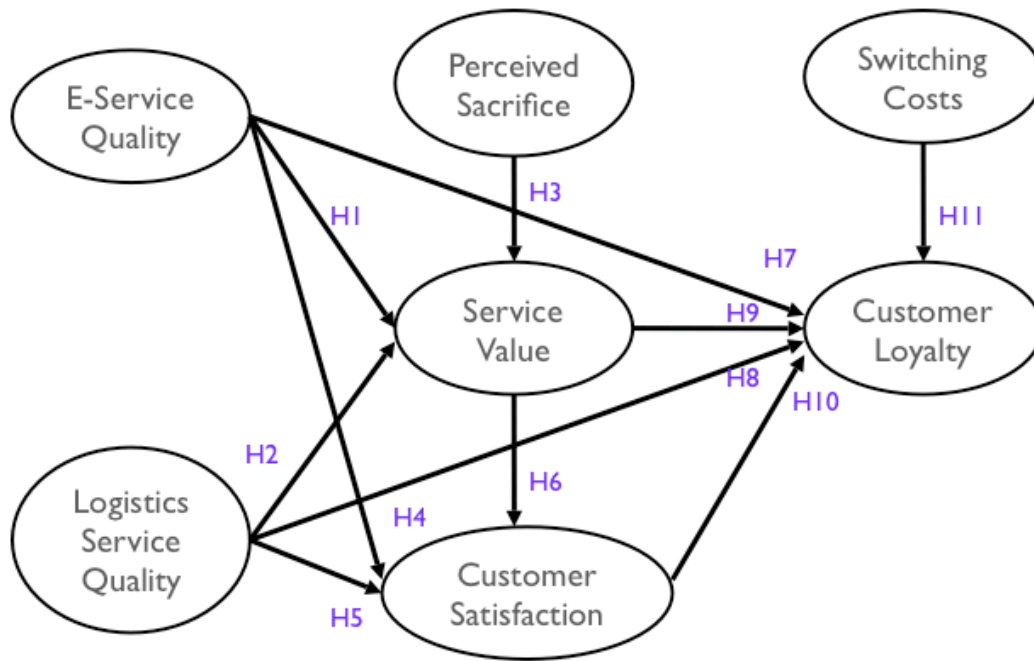


Figure 3.1 Conceptual Framework

3.2 Research Hypotheses

Based on literature review in chapter two and the conceptual framework, numerous hypotheses were developed in this study:

- H1: E-service quality of on-line bookstores has a significant positive effect on perceived service value.
- H2: Logistics service quality of retailing delivery has a significant positive effect on perceived service value.
- H3: Perceived sacrifice has a significant positive effect on perceived service value.
- H4: E-service quality of on-line bookstores has a significant positive effect on customer satisfaction.
- H5: Logistics service quality of retailing delivery has a significant positive effect on customer satisfaction.
- H6: Perceived service value has a significant positive effect on customer satisfaction.

H7: E-service quality of on-line bookstores has a significant positive effect on customer loyalty.

H8: Logistics service quality of retailing delivery has a significant positive effect on customer loyalty.

H9: Perceived service value has a significant positive effect on customer loyalty.

H10: Customer satisfaction has a significant positive effect on customer loyalty.

H11: Switching costs has a significant positive effect on customer loyalty.

3.3 Construct Measurement

For the purposes of this study, the following seven major constructs are defined in this section: (1) E-Service Quality, (2) Logistics Service Quality, (3) Perceived Sacrifice, (4) Service Value, (5) Customer Satisfaction, (6) Switching Costs, and (7) Customer Loyalty. The measurement items of these constructs are adopted and modified according to previous researches, and all of them using Likert 5-point scales rating from “strongly disagree = 1” to “strongly agree = 5”.

3.3.1 E-Service Quality

According to Collier and Bienstocks (2006), process quality of e-service quality is customers' quality evaluations based on the interactive process that takes place on the Internet. Then e-service quality in this study is defined as the interaction of a customer and an on-line bookstore when the customer entered the on-line bookstore to order books, and that is the website service quality provided by the on-line bookstores. Moreover, Collier and Bienstocks (2006) used five dimensions to measure process quality, and hence this study adopts and modifies the definitions of these five dimensions, described as follows.

(1) Ease of use, the on-line bookstore's ability to enable customers to find information or enact a transaction with the least amount of effort; (2) Privacy, the on-line bookstore will not share information with third parties unless the customer gives permission; (3) Design, the visual appearances and audible applications of the on-line bookstore; (4) Information, information provided by the on-line bookstore regarding products or services is sufficient and accurate; (5) Functionality, the on-line bookstore's ability to execute customer commands and provide customers the function of choosing.

To measure customers' perceptions of this construct, 27 questionnaire items are employed. These 27 items are mainly adopted and modified based on the studies of Collier and Bienstocks (2006) and of Parasuraman, Zeithaml, and Malhotra (2005), and they are categorized into the above-mentioned five dimensions. Table 3.1 displays the questionnaire items for e-service quality.

3.3.2 Logistics Service Quality

Logistics service quality is customers' quality evaluations of delivery, and it is similar to the definition of outcome quality by Collier and Bienstocks (2006), customers' evaluations of how the products or services are delivered. Then logistics service quality in this study is defined as how the books or services are delivered after the customers have ordered books, and that is the service quality about retailing delivery service provided by the on-line bookstores.

To measure customers' perception of logistics service quality, 15 questionnaire items are adopted and modified according to the studies of Mentzer, Flint, and Hult (2001), Collier and Bienstocks (2006), and Feng and Huang (2003, 2006). These 15 items are categorized into four dimensions described as follows.

(1) Information Quality, the information provided by the RD provider regarding delivery is sufficient and accurate; (2) Timeliness, whether the books or services are received within the expected amount of time; (3) Order Condition, how closely the books or services match customers' order, and the lack of damage to the books; (4) Personnel Contact Quality, whether the staff of convenience stores are knowledgeable and have a good manner. Table 3.1 displays the questionnaire items for logistics service quality.

3.3.3 Perceived Sacrifice

According to Zeithaml (1988), the definition of perceived sacrifice in this study is what is given up or sacrificed when ordering books in the on-line bookstore, and including monetary and non-monetary costs. To measure customers' perception of sacrifice, this study adopts 3 questionnaire items based on Cronin *et al.* (2000). Table 3.1 displays the questionnaire items for perceived sacrifice.

3.3.4 Service Value

Following Zeithaml (1988), service value in this study is defined as the overall assessment of utility of books or services based on perceived of what is received and what is given, and this is a trade-off between benefits and sacrifices. To measure customers' perception of service value, 3 questionnaire items are employed,

and these items are adopted based on the study of Dodds, Mornoe, and Grewal(1991). Table 3.1 displays the questionnaire items for service value.

3.3.5 Customer Satisfaction

Following Oliver (1981), customer satisfaction in this study is defined as customers' overall evaluation of their feelings after ordering books in the on-line bookstore. There are 3 questionnaire items used to measure customers' perception of satisfaction, and these items are according to the studies of Cronin *et al.* (2000) and Tsai *et al.* (2006). Table 3.1 displays the questionnaire items for customer satisfaction.

3.3.6 Switching Costs

According to Heide and Weiss (1995), the definition of switching costs in this study is the costs involved in changing from the original on-line bookstore to another, including both financial and non-financial costs. To measure customers' perception of switching costs, this study adopts 5 questionnaire items based on the studies of Burnham *et al.* (2003) and Feng and Huang (2006). Table 3.1 displays the questionnaire items for switching costs.

3.3.7 Customer Loyalty

According to Oliver (1999), customer loyalty in this study is defined as the overall attachment or deep commitment to the on-line bookstore, including repeat purchasing and recommendation. In addition, the 4 questionnaire items are used to measure customers' perception of loyalty, and these items are based on the studies of Collier and Bienstocks (2006) and Parasuraman, Zeithaml, and Malhotra (2005). Table 3.1 displays the questionnaire items for customer loyalty.

3.4 Questionnaire Design

First, to understand respondents' experience of ordering books in the on-line bookstore, 7 questionnaire items are employed. Then, as discussed in section 3.3, a 60-items survey questionnaire is developed to measure the research constructs in this study: "e-service quality (27 items)," "logistics service quality (15 items)," "perceived sacrifice (3 items)," "service value (3 items)," "customer satisfaction (3 items)," "switching costs (5 items)," and "customer loyalty (4 items)." All of these

items using Likert 5-point scales. Besides, the demographics of the respondents are also contained.

Table 3.1 Measurements of Research Constructs

Constructs	Measurement Items	Literature Based
E-Service Quality	<u>Ease of Use</u> I can find the books what I need by using search engine easily. The site records all the books I have ever browsed, and it allows me to browse them again conveniently. The hyperlinks make it convenient to browse the books that interest me. The shopping procedure is easy to understand. It enables me to complete a transaction quickly. The site is simple to use.	PZM(2005) Collier and Bienstock (2006) Dadize <i>et al.</i> (2005) Bauer, Falk, and Hammerschmidt (2006)
	<u>Privacy</u> There are special measures for protecting information about my on-line transaction. My personal information will not be stolen or disclosed. Advertisements will not be mailed to me without my permission The site has passed a security review and has the secure symbols.	
	<u>Design</u> The site is attractively designed and is visually pleasing. The display of objectives and graphics is appealed. The site can provide most of the covers of books, and it makes the pages look more orderly. The text and graphics are clear and easy to understand.	
	<u>Information</u> The information about books is accurate. The site provides information about new books. The site provides information about best-selling books. The information about books is sufficient. The site will send an e-mail or message to me to confirm my book order. I can follow the conditions of my orders. The site provides complete illustrations for returning and changing books.	
	<u>Functionality</u> The site loads its pages quickly. It provides the functions for interaction. It gives me numerous options of merchandise other than books. It provides numerous premiums, like bonuses and e-coupon. It gives me numerous options for payment. It gives me numerous options for delivery.	

Constructs	Measurement Items	Literature Based
Logistics Service Quality	<u>Information Quality</u> The e-map interface lets me choose a pick-up point conveniently. It gives me numerous options to choose the pick-up point. The information of convenience stores on the e-map is accurate. After my books arrived at the convenience store, it will send a message to remind me to pick up the books.	Mentzer, Flint, and Hult (2001) Collier and Bienstock (2006) Feng and Huang (2006)
	<u>Timeliness</u> When I use an e-map, the information is processed quickly. Time between ordering books and receiving books is short. Books arrive on the date promised.	
	<u>Order Condition</u> It reliably delivers my books to the convenience store I chose. When I pick-up the books I ordered, the bar code information is accurate and can be read. Damage rarely occurs during transportation of my books. The books I received are undamaged.	
	<u>Personnel Contact Quality</u> When I pick up, the convenience store staff can quickly find the books I ordered. When I pick up, the convenience store staffs have good manners. The convenience store staffs have good manners even though they are busy. When there is a problem with delivery, the convenience store staff can immediately tell me what to do.	
Perceived Sacrifice	I think the prices charged for ordering books from this on-line bookstore are reasonable. I think ordering books in this on-line bookstore does not take much time. I think ordering books in this on-line bookstore is easy.	Cronin <i>et al.</i> (2000)
Service Value	I think that the service provided by this on-line bookstore compared to the price I had to pay is acceptable. I think that it is more worthwhile to use this on-line bookstore than others. Compared to the price, I think the service provided by this on-line bookstore is very valuable.	Dodds <i>et al.</i> (1991)
Customer Satisfaction	In general, the service from this on-line bookstore conformed to my expectations. In general, I am satisfied with the service that this on-line bookstore provided. Shopping on this on-line bookstore is a wise decision.	Cronin <i>et al.</i> (2000) Tsai <i>et al.</i> (2006)

Constructs	Measurement Items	Literature Based
Switching Costs	<p>I am used to choosing the same on-line bookstore to order books.</p> <p>I feel troublesome about some procedures for joining a new on-line bookstore to order books.</p> <p>If I choose another on-line bookstore, the pick-up place is not convenient for me.</p> <p>If I choose another on-line bookstore, I will lose some premiums.</p> <p>If I choose another on-line bookstore, I need to spend some effort to know the service well.</p>	<p>Burnham <i>et al.</i> (2003)</p> <p>Feng and Huang (2006)</p>
Customer Loyalty	<p>I will recommend this on-line bookstore to my friends.</p> <p>If I want to buy books, I will choose this on-line bookstore first.</p> <p>I am willing to do other business in this on-line bookstore.</p> <p>Compare to other on-line bookstores, I prefer this on-line bookstore.</p>	<p>PZM(2005)</p> <p>Collier and Bienstock (2006)</p>

3.5 Sampling Plan

The research sample in this study was people who have previously ordered books from on-line bookstores, specifically BOOKS.com and KingStone, and then picked up their books at convenience stores. The sampling was conducting by on-line surveys to collect sample data from the target population. The on-line survey generates raw data automatically in a database, and it can save much time and avoid human mistakes when coding data.

3.6 Data Analysis Procedure and Methods

In order to investigate the objectives and test the hypotheses of this study, SPSS and AMOS software were used to help us analyze the collected data. Furthermore, freeware ConstructMap was also employed to reduce the questionnaire items.

3.6.1 Rasch Model

Rasch model is a method for analyzing data from assessments to measure things such as abilities, attitudes, and personality traits. Rasch model is the most basic and the simplest model of item response theory (IRT), and is firstly proposed by Georg Rasch in 1960. Rasch model has only two ingredients, one ability parameter B_n for each person n and one difficulty parameter D_i for each item i . These parameters are used to determine the probability of person n succeeding on

item i through log-odds. The equation below considered only dichotomous responses:

$$\ln \frac{P(1|B_n, D_i)}{P(0|B_n, D_i)} = B_n - D_i$$

where, $P(1|B_n, D_i)$ is the probability of a “Yes” response to item i and $P(0|B_n, D_i)$ is the probability of a “No” response. When $B_n > D_i$, the probability of a “Yes” response is more than 50%. When $B_n = D_i$, the probability of a “Yes” response is 50%. When $B_n < D_i$, the probability of a “Yes” response is less than 50%.

In Rasch model, the estimation of the parameter B_n and D_i will not be affected by each other. And this mathematical property is called “test-free” and “person-free” or “sample-free” measurement. It implies that the difficulty parameter of an item does not depend on the ability distribution of the sample, and the ability parameter of a person does not depend on the set of test items (Prieto, Alonso, and Lamarca, 2003).

In addition to dichotomous responses, Rasch model has been modified to be applicable to polytomous rating-scale instrument, such as Likert scales. The Polytomous Rasch model views one multinomial-choice problem as several binary choice problems and it can be divided into two different models, Rating Scale Model (RSM) and Partial Credit Model (PCM). The rating scale model is used for instruments in which the definition of the rating scale is the same for all items, while the partial credit model is used when the definition of the rating scale differs from one item to another (Chang and Wu, 2008).

In rating scale model, it modified the original difficulty parameter D_i to D_{ix} , and that represents the threshold of rating category $x-1$ to category x of item i . Therefore, the log-odds of the probability that a person responds in category x for item i , compared with category $x-1$ can be represented:

$$\ln \frac{P_{nix}}{P_{ni(x-1)}} = B_n - D_{ix}$$

The partial credit model is similar to the rating scale model except that each item i has its own threshold parameters F_{ix} , for each category. So the parameter D_{ix} is refined:

$$D_{ix} = D_i + F_{ix}$$

and the partial credit model becomes

$$\ln \frac{P_{nix}}{P_{ni(x-1)}} = B_n - D_i - F_{ix}$$

Outfit (outlier-sensitive fit) and Infit (information-weighted fit) statistics are the most widely used diagnostics Rasch fit statistics. The comparison is with an estimated value that is near to or far from the expected value. They are reported as Mean-Squares (MNSQ), that is, the chi-square statistics divided by their degrees of freedom. If X is an observation, E is the expected value based on Rasch parameter estimates, and σ^2 is the variance of expectation, then the squared standardized residual is:

$$z^2 = (X - E)^2 / \sigma^2$$

The Mean-Square Outfit statistics is obtained by the summed squared standardized residual with divided by total observation number N :

$$\text{Mean-Square Outfit} = \frac{\sum(z^2)}{N}$$

In addition to the Outfit statistics, the Infit statistics weights the squared residual by its variance σ^2 . It can be calculated as:

$$\text{Mean-Square Infit} = \frac{\sum(z^2 \sigma^2)}{\sum(\sigma^2)}$$

Furthermore, the Outfit and Infit can be expressed as normalized residuals (Zstd) via a transformation into a t-statistic with an approximate unit normal distribution. The usually acceptable criteria of the fit statistics are $0.7 \leq \text{Mean-Square} \leq 1.3$ and $-2 \leq \text{Zstd} \leq 2$.

3.6.2 Structural Equation Model

Structural equation model (SEM) is also called causal model, causal analysis, simultaneous equation model, analysis of covariance structures, path analysis, and confirmatory factor analysis. SEM is used to explain the relationships between a set of latent (unobserved) constructs, each measured by one or more observed variables (Reisinger and Turner, 1999). The observed variables can be directly measured, but the latent variables are not directly observed like attitudes, customer satisfaction, perception of value or quality.

SEM is a multivariate technique combining aspects of multiple and factor analysis. When using SEM, latent variables can be separated into “exogenous” (independent) variables and “endogenous” (dependent) variables, and there existing several linear regression equations that describe how the endogenous variables depend on the exogenous variables. SEM encourages confirmatory rather than exploratory modeling, so it is critical that all construct of SEM must be directed by theory for model development and modification.

SEM is characterized by two components: the measurement model and the structural model. SEMs are most often represented graphically. Figure 3.2 show a graphical example of a SEM:

1. *Measurement model* represents the relationship between observed variables and latent variables including the relationship between latent endogenous construct and measured dependent variable, and the relationship between latent exogenous construct and measured independent variable. The equations are shown below:

$$y = \lambda_y * \eta + \varepsilon$$

$$x = \lambda_x * \xi + \delta$$

Where x - measured independent variable

y - measured dependent variable

ξ - latent exogenous construct explained by x -variables

η - latent endogenous construct explained by y -variables

δ - error for x -variable

ε - error for y -variable

λ - correlation between measured variables and all latent constructs

2. *Structural model* includes the relationships among the latent constructs including exogenous construct and endogenous construct. The equation is shown below:

$$\eta = \beta * \eta + \gamma * \xi + \zeta$$

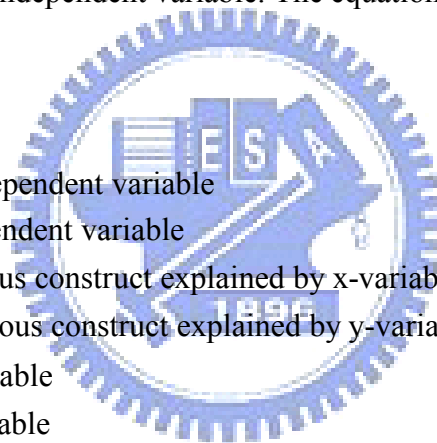
Where η - latent endogenous construct

ξ - latent exogenous construct

β - correlations between endogenous latent constructs η

γ - correlation between latent constructs ξ (exogenous) and η (endogenous)

ζ - structural error term



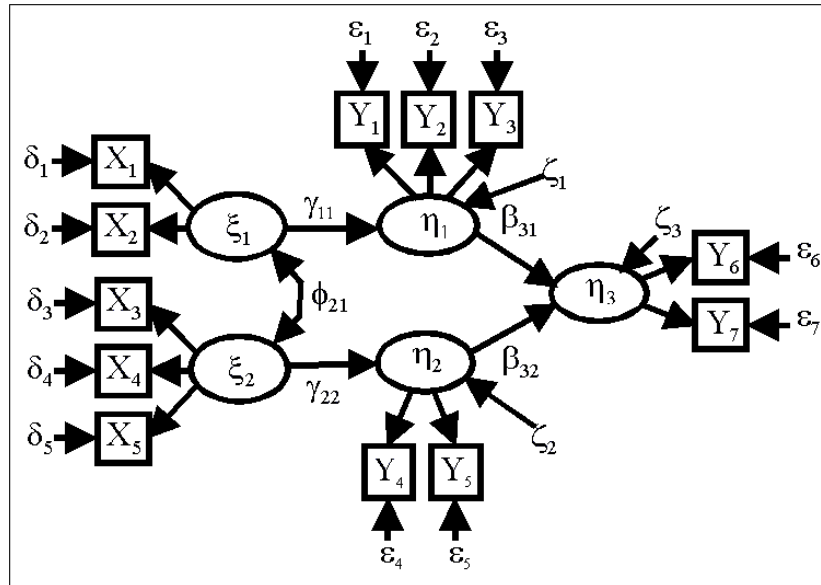


Figure 3.2 A Graphical Example of SEM

Source: <http://www.gsu.edu/~mkteer/sem2.html>

Goodness-of-fit tests are used to determine whether the model should or should be rejected. A number of goodness-of-fit indexes are used to evaluate the overall fit, the comparative fit to a base model, and model parsimony. The recommended level of the goodness-of-fit indexes are shown in Table 3.2.

Table 3.2 Goodness-of-Fit Measures for Overall Model Fit

Goodness-of-Fit Index	Recommended Level	Description
Chi-square Statistic (χ^2)	$P > 0.05$	The most fundamental measure of overall fit.
Root Mean Square Residual (RMR)	< 0.05	The average residuals between observed and estimated input matrices.
Root Mean Square Error of Approximation (RMSEA)	< 0.08	It is less affected by sample size than χ^2 and it has been better than RMR.
Goodness of Fit (GFI)	> 0.9	A descriptive goodness-of-fit measure ranged from 0 to 1.
Adjusted Goodness of Fit (AGFI)	> 0.9	It adjusts the GFI for the number of degrees of freedom expended in estimating the model parameters.
Normal Fit Index (NFI)	> 0.9	It assesses fit by comparing the tested model with a null model, and its range is from 0 to 1.
Nonnormed Fit Index (NNFI)	> 0.9	It involves the degree of freedom, and it can exceed the 0 to 1 range.
Comparative Fit Index (CFI)	> 0.9	It is used in small samples.

CHAPTER 4 RESEARCH ANALYSIS AND RESULTS

In this chapter, the descriptive results of sample distribution would be presented, and the reliability and validity of the measurement scales would be verified. The structural equation modeling for the BOOKS.com sample and KingStone sample are also demonstrated to analyze the overall relationships among research constructs. The direct and indirect effects of these constructs would be including, too. Finally, importance-performance analysis of e-service quality and logistics service quality for BOOKS.com sample and KingStone sample are also presented.

4.1 Descriptive Analysis

The preliminary analyses were conducted in this section to provide information about the characteristics of respondents and the results of research variables.

4.1.1 Data Collection

The data was gathered through an on-line questionnaire survey that can be obtained at CVS.com, Shopping99.com, and the KingStone on-line bookstore. The final survey yielded a total of 3132 valid questionnaires. There was no missing data among the 3132 questionnaires, and all of them were usable.

4.1.2 Characteristics of Respondents

Table 4-1 and Table 4-2 present characteristics of the total sample (n=3132), which includes two major parts, the experiences of ordering books in the on-line bookstores and the demographics of the respondents.

Table 4-1 shows that about 65% of the respondents may choose KingStone first and BOOKS.com second, and it shows that almost 95% of the respondents like to choose KingStone and BOOKS.com before any others. Furthermore, more than 90% of the respondents spend less than NT1000 dollars to buy books each time, and most of them prefer paper bag packaging.

Table 4.1 Profiles of the Sample (Part I)

Classification	Frequency	Percentage (%)
The on-line bookstore that is the most frequently visited.		
KingStone	2022	64.6
BOOKS.com	950	30.3
Others	160	5.1
The on-line bookstore that is the second frequently visited.		
KingStone	968	30.9
BOOKS.com	1585	50.6
Others	579	18.5
The history of ordering books in on-line bookstores and picking up books at convenience stores.		
More than 5 years	560	17.9
3 - 5 years	839	26.8
2 - 3 years	587	18.7
1 - 2 years	500	16
0.5 - 1 year	294	9.4
Less than six months	352	11.2
The average frequency of ordering books in on-line bookstores.		
1 week	147	4.7
1 - 2 weeks	237	7.6
2 - 4 weeks	484	15.5
1 - 2 months	908	29
2 - 3 months	405	12.9
3 - 6 months	515	16.4
More than 6 months	436	13.9
The average amount of money that spent in on-line bookstore one time.		
Less than 250 dollars	281	9
251 - 500 dollars	1474	47.1
501 - 1000 dollars	1074	34.3
1001 - 1500 dollars	207	6.6
1501 - 2000 dollars	55	1.8
2001 - 2500 dollars	15	0.5
More than 2501 dollars	26	0.8
The types of books that are most frequently bought (choice multiple).		
Philology	1933	61.7
Finance and economics	575	18.4
Life & Arts	1048	33.5
Comics & Graphic Novels	706	22.5
Children's Books	451	14.4
Science & Humanism	333	10.6
Education	1033	33
Mind & Health	629	20.1

Classification	Frequency	Percentage (%)
The preferable packaging.		
Paper bag	2064	65.9
Plastic bag	793	25.3
Others	275	8.8

Table 4-2 shows that more than 75% of the respondents are female. More than 75% of the respondents are 19-40 years old while less than 2% of the respondents are over 51 years old. Most respondents (71.5%) are single, and most respondents (67.1%) have a Bachelors degree. Furthermore, more than half of the respondents are students or employees of a company, and more than 55% of the respondents live in northern Taiwan.

Table 4.2 Profiles of the Sample (Part II)

Classification	Frequency	Percentage (%)
Gender		
Male	756	24.1
Female	2376	75.9
Age		
Less than 15 years old	126	4
16 - 18 years old	330	10.5
19 - 22 years old	503	16.1
23 - 29 years old	959	30.6
30 - 40 years old	928	29.6
41 - 50 years old	237	7.6
More than 51 years old	49	1.6
Marital Status		
Single	2239	71.5
Married (have kids)	691	22.1
Married (no kids)	169	5.4
Others	33	1.1
Education		
Junior high school or less	138	4.4
Senior high school	501	16
College/University	2103	67.1
Graduate school or more	390	12.5
Occupation		
Student	1027	32.8
Housekeeping	153	4.9
Soldier	14	0.4
Government Employee	131	4.2
Teacher	189	6
Professional	100	3.2
Freelancer	128	4.1

Classification	Frequency	Percentage (%)
Employee of A Company	649	20.7
Manufacturing	103	3.3
Information Technologist	147	4.7
Retailing	45	1.4
Others	446	14.2
Income (N.T dollars per month)		
Less than 5000 dollars	918	29.3
5001 - 10000 dollars	292	9.3
10001 - 20000 dollars	302	9.6
20001 - 30000 dollars	589	18.8
More than 30001 dollars	1031	32.9
Area		
Northern Taiwan	1750	55.9
Central Taiwan	590	18.8
Southern Taiwan	686	21.9
Eastern Taiwan	78	2.5
Offshore Taiwan	6	0.2
Others	22	0.7

4.1.3 Measurement Results of Research Variables

Table 4-3 provides descriptive statistics (means and standard deviations) of questionnaire items for the research variables. There are 27 items of e-service quality, 15 items of logistics service quality, 3 items of perceived sacrifice, 3 items of service value, 3 items of customer satisfaction, 5 items of switching costs, and 4 items of customer loyalty.

For the construct of e-service quality, respondents tend to perceive positive evaluations of the research items with most of mean scores over 4 in a five-Likert-type scale. In addition, the mean scores of the items of logistics service quality are over 4.19. These results show that the respondents have very positive evaluations of the research items.

For the construct of perceived sacrifice, respondents tend to have a high level of agreement on the measurement items with mean scores over 4.11 in a five-Likert-type scale. In addition, the mean score of the items of service value are over 4.16, and the results mean that the respondents have a high level of agreement on the measurement items. For the construct of customer satisfaction, the results indicate that the respondents are satisfied with the on-line bookstore they chose with mean scores of all 3 items greater than 4.23 in a five-Likert-type scale.

Furthermore, the mean scores of 5 items of switching costs vary from 3.22 to 4.14, and the results mean that the respondents do not perceive a high barrier in

switching to another on-line bookstore. Finally, for the construct of customer loyalty, respondents tend to evaluate the measurement items with favorable opinions with mean scores over 4.14 in a five-Likert-type scale.

Table 4.3 Descriptive Analysis of Research Variables

Items	Description	Mean	Std. Dev.
E-Service Quality			
ESQ1	I can find the books what I need by using search engine easily.	4.41	0.692
ESQ2	The site records all the books I have ever browsed, and it allows me to browse them again conveniently.	4.22	0.808
ESQ3	The hyperlinks make it convenient to browse the books that interest me.	4.25	0.739
ESQ4	The shopping procedure is easy to understand.	4.47	0.65
ESQ5	It enables me to complete a transaction quickly.	4.48	0.656
ESQ6	The site is simple to use.	4.45	0.677
ESQ7	There are special measures for protecting information about my on-line transaction.	4.29	0.881
ESQ8	My personal information will not be stolen or disclosed.	4.14	1.064
ESQ9	Advertisements will not be mailed to me without my permission	4.15	0.882
ESQ10	The site has passed a security review and has the secure symbols.	4.34	0.756
ESQ11	The site is attractively designed and is visually pleasing.	4.17	0.767
ESQ12	The display of objectives and graphics is appealed.	4.14	0.783
ESQ13	The site can provide most of the covers of books, and it makes the pages look more orderly.	4.22	0.794
ESQ14	The text and graphics are clear and easy to understand.	4.23	0.766
ESQ15	The information about books is accurate.	4.28	0.77
ESQ16	The site provides information about new books.	4.29	0.734
ESQ17	The site provides information about best-selling books.	4.29	0.727
ESQ18	The information about books is sufficient.	4.15	0.869
ESQ19	The site will send an e-mail or message to me to confirm my book order.	4.47	0.713
ESQ20	I can follow the conditions of my orders.	4.47	0.686
ESQ21	The site provides complete illustrations for returning and changing books.	4.34	0.773
ESQ22	The site loads its pages quickly.	4.11	0.887
ESQ23	It provides the functions for interaction.	3.94	0.908
ESQ24	It gives me numerous options of merchandise other than books.	4.09	0.864
ESQ25	It provides numerous premiums, like bonuses and e-coupon.	4.25	0.899
ESQ26	It gives me numerous options for payment.	4.42	0.723
ESQ27	It gives me numerous options for delivery.	4.44	0.726
Logistics Service Quality			
LSQ1	The e-map interface lets me choose a pick-up point conveniently.	4.41	0.747
LSQ2	It gives me numerous options to choose the pick-up point.	4.42	0.725
LSQ3	The information of convenience stores on the e-map is accurate.	4.42	0.722
LSQ4	After my books arrived at the convenience store, it will send a message to remind me to pick up the books.	4.41	0.793

Items	Description	Mean	Std. Dev.
LSQ5	When I use an e-map, the information is processed quickly.	4.27	0.821
LSQ6	Time between ordering books and receiving books is short.	4.31	0.811
LSQ7	Books arrive on the date promised.	4.4	0.736
LSQ8	It reliably delivers my books to the convenience store I chose.	4.58	0.61
LSQ9	When I pick-up the books I ordered, the bar code information is accurate and can be read.	4.53	0.628
LSQ10	Damage rarely occurs during transportation of my books.	4.42	0.752
LSQ11	The books I received are undamaged.	4.41	0.787
LSQ12	When I pick up, the convenience store staff can quickly find the books I ordered.	4.33	0.784
LSQ13	When I pick up, the convenience store staff have good manners.	4.33	0.767
LSQ14	The convenience store staff have good manners even though they are busy.	4.27	0.814
LSQ15	When there is a problem with delivery, the convenience store staff can immediately tell me what to do.	4.19	0.88
Perceived Sacrifice			
SAC1	I think the prices charged for ordering books from this on-line bookstore are reasonable.	4.11	0.804
SAC2	I think ordering books in this on-line bookstore does not take much time.	4.25	0.761
SAC3	I think ordering books in this on-line bookstore is easy.	4.38	0.69
Service Value			
VAL1	I think that the service provided by this on-line bookstore compared to the price I had to pay is acceptable.	4.25	0.745
VAL2	I think that it is more worthwhile to use this on-line bookstore than others.	4.16	0.77
VAL3	Compared to the price, I think the service provided by this on-line bookstore is very valuable.	4.2	0.767
Customer Satisfaction			
SAT1	In general, the service from this on-line bookstore conformed to my expectations.	4.27	0.715
SAT2	In general, I am satisfied with the service that this on-line bookstore provided.	4.28	0.721
SAT3	Shopping on this on-line bookstore is a wise decision.	4.23	0.748
Switching Costs			
SC1	I am used to choosing the same on-line bookstore to order books.	4.14	0.88
SC2	I feel troublesome about some procedures for joining a new on-line bookstore to order books.	3.75	1
SC3	If I choose another on-line bookstore, the pick-up place is not convenient for me.	3.22	1.091
SC4	If I choose another on-line bookstore, I will lose some premiums.	3.88	0.983
SC5	If I choose another on-line bookstore, I need to spend some effort to know the service well.	3.64	1.038

Items	Description	Mean	Std. Dev.
Customer Loyalty			
LOY1	I will recommend this on-line bookstore to my friends.	4.27	0.76
LOY2	If I want to buy books, I will choose this on-line bookstore first.	4.35	0.734
LOY3	I am willing to do other business in this on-line bookstore.	4.14	0.812
LOY4	Compare to other on-line bookstores, I prefer this on-line bookstore.	4.27	0.772

4.1.4 Characteristics of the Two Sample

According to section 4.1.2, in the total sample (n=3132), 2022 respondents chose KingStone on-line bookstore most frequently, and 950 respondents may chose BOOKS.com most frequently. To compare the relationships among the research constructs of these two major on-line bookstores, this study adopted the sample of BOOKS.com and KingStone. In order to make these two sample sizes equal, about 45% of the KingStone respondents were chosen, and the final sample sizes for BOOKS.com and KingStone are 950 and 942.

Table 4.4 presents characteristics of the two samples ($n_1=950$ and $n_2=942$). These two samples are similar to the total sample, with most being female, 19-40 years old, and single. Furthermore, more than half of the respondents live in northern Taiwan.

Table 4.4 Profiles of the Two Samples

Classification	BOOKS.com ($n_1=950$)		KingStone ($n_2=942$)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Gender				
Male	223	23.5	214	22.7
Female	727	76.5	728	77.3
Age				
Less than 15 years old	34	3.6	46	4.9
16 - 18 years old	101	10.6	103	10.9
19 - 22 years old	173	18.2	150	15.9
23 - 29 years old	306	32.2	297	31.5
30 - 40 years old	263	27.7	266	28.2
41 - 50 years old	60	6.3	70	7.4
More than 51 years old	13	1.4	10	1.1
Marital Status				
Single	693	72.9	685	72.7
Married (have kids)	191	20.1	203	21.5
Married (no kids)	54	5.7	45	4.8
Others	12	1.3	9	1

Classification	BOOKS.com (n ₁ =950)		KingStone (n ₂ =942)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Education				
Junior high school or less	39	4.1	54	5.7
Senior high school	151	15.9	133	14.1
College/University	618	65.1	656	69.6
Graduate school or more	142	14.9	99	10.5
Occupation				
Student	341	35.9	317	33.7
Housekeeping	43	4.5	47	5
Soldier	5	0.5	4	0.4
Government Employee	38	4	35	3.7
Teacher	56	5.9	57	6.1
Professional	31	3.3	31	3.3
Freelancer	34	3.6	44	4.7
Employee of Company	184	19.4	199	21.1
Manufacturing	27	2.8	24	2.5
Information Technologist	44	4.6	51	5.4
Retailing	11	1.2	14	1.5
Others	136	14.3	119	12.6
Income (N.T dollars per month)				
Less than 5000 dollars	317	33.4	287	30.5
5001 - 10000 dollars	97	10.2	83	8.8
10001 - 20000 dollars	87	9.1	84	8.9
20002 - 30000 dollars	150	15.8	191	20.3
More than 30001 dollars	299	31.5	297	31.5
Area				
Northern Taiwan	506	53.3	528	56.1
Central Taiwan	188	19.8	184	19.5
Southern Taiwan	225	23.7	198	21
Eastern Taiwan	22	2.3	27	2.9
Offshore Taiwan	3	0.3	0	0
Others	6	0.6	5	0.5

4.2 Questionnaire Reduction

When all e-service quality and logistics service quality items are included in the measurement model, the model would not fit the data well. To overcome this problem, a Rasch model is employed to reduce the number of the measurement items. Rasch model can evaluate the unidimensionality of a scale by the pattern of item goodness-of-fit statistics. This study adopted the partial credit model (PCM)

and performed it on a sub-sample (n=787), and the criteria of $0.7 \leq \text{Infit MNSQ} \leq 1.3$ and $0.7 \leq \text{Outfit MNSQ} \leq 1.3$ to reduce the measurement items. Successive Rasch model is performed until a final set of items satisfied the model fit requirements.

Item fit was assessed for the nine subscales (Ease of Use, Privacy, Design, Information, and Functionality for E-Service Quality & Information Quality, Timeliness, Order Condition, and Personnel Contact Quality for Logistics Service Quality). The misfitting items (fit <0.7 and fit >1.3) were removed from the individual scales and the Rasch model re-run until no further misfit was observed. After the first stage of item removing, the item fit of remaining items for E-Service Quality and Logistics Service Quality total scale was also assessed. The misfitting items were also removed until no further improvement in fit requirements was found. The item measures and fit statistics of the two-stage Rasch model are provided in Table 4.5 and Table 4.6.

Table 4.5 describes that the Rasch analysis of the 27 items of the E-Service Quality showed 6 misfitting items. Two items were identified as misfitting from the analysis of the Ease of Use, namely ESQ4 (“The shopping procedure is easy to understand”) and ESQ5 (“It enables me to complete a transaction quickly”). For the Privacy scale, there is no misfitting item. One item from the Design scale demonstrated misfit (ESQ13, “The site can provide most of the covers of books, and it makes the pages look more orderly”), and one item from the Information scale demonstrated redundancy (ESQ20, “I can follow the conditions of my orders”). In addition, for the Functionality scale, there is one misfitting item, namely ESQ26 (“It gives me numerous options for payment”). Finally, one item was identified as misfitting from the remaining E-Service Quality scale, namely ESQ8 (“My personal information will not be stolen or disclosed”). All items from the scales presented good fit when misfitting items had been removed.

Table 4.5 Item location and fit for E-Service Quality

Items	Five Subscales for ESQ				ESQ Total Scale			
	Measure	S.E.	Infit MNSQ	Outfit MNSQ	Measure	S.E.	Infit MNSQ	Outfit MNSQ
Ease of Use								
ESQ1	-0.28	0.048	0.75	0.74	-1.173	0.045	0.9	0.91
ESQ2	0.336	0.044	1.10	1.04	-0.178	0.042	1.19	1.32
ESQ3	0.049	0.047	0.90	0.87	-0.904	0.044	1.02	1.06
ESQ4	-0.198	0.049	0.39	0.38	--	--	--	--
ESQ5	-0.125	0.049	0.35	0.35	--	--	--	--
ESQ6	-0.104	--	1.09	1.13	-0.422	0.045	0.8	0.82

Items	Five Subscales for ESQ				ESQ Total Scale			
	Measure	S.E.	Infit MNSQ	Outfit MNSQ	Measure	S.E.	Infit MNSQ	Outfit MNSQ
Privacy								
ESQ7	-0.058	0.043	0.71	0.61	0.342	0.040	1.08	1.22
ESQ8	0.569	0.040	0.94	0.81	0.853	0.036	1.43	1.67
ESQ9	0.139	0.044	1.03	0.99	0.486	0.040	1.12	1.31
ESQ10	-0.650	--	1.12	1.24	-0.478	0.043	0.98	0.96
Design								
ESQ11	0.047	0.046	0.90	0.89	0.074	0.043	1.08	1.12
ESQ12	0.016	0.046	0.80	0.77	0.047	0.043	0.98	0.97
ESQ13	-0.106	0.046	0.59	0.56	--	--	--	--
ESQ14	-0.064	--	1.18	1.20	0.060	0.043	0.92	0.89
Information								
ESQ15	0.110	0.044	0.92	0.92	0.146	0.043	0.86	0.84
ESQ16	-0.018	0.045	1.01	0.96	-0.028	0.044	0.96	0.94
ESQ17	-0.200	0.046	1.05	1.03	-0.408	0.044	0.97	0.97
ESQ18	0.5457	0.042	1.07	1.09	0.462	0.041	1.04	1.01
ESQ19	-0.375	0.046	0.93	0.90	-0.313	0.044	0.77	0.76
ESQ20	-0.275	0.046	0.67	0.70	--	--	--	--
ESQ21	0.025	--	1.05	1.06	0.074	0.042	0.82	0.85
Functionality								
ESQ22	0.154	0.040	1.02	0.98	0.603	0.040	1.05	1.1
ESQ23	0.443	0.040	0.98	0.95	0.905	0.041	1.04	1.08
ESQ24	0.088	0.041	1.11	1.06	0.535	0.041	1.14	1.18
ESQ25	-0.060	0.040	0.85	0.83	0.383	0.040	1.16	1.19
ESQ26	-0.607	0.044	0.25	0.21	--	--	--	--
ESQ27	-0.624	--	1.11	1.15	-0.214	--	0.9	1.1

*Infit/Outfit <0.7 and Infit/Outfit > 1.3 are highlighted in bold.

**Table shows final item locations for scales when misfitting items have been removed, as well as initial fit statistics and parameters for those misfitting items.

Table 4.6 shows that the Rasch analysis of the 15 items of the Logistics Service Quality presented 3 misfitting item. For the Information Quality scale there were no misfitting items. In addition, one item was identified as misfitting from the Timeliness scale (LSQ5, “When I use an e-map, the information is processed quickly”), and one item from the Order Condition scale demonstrated redundancy (LSQ10, “Damage rarely occurs during transportation of my books”). For the Personnel Contact Quality scale, one item was identified as misfitting (LSQ14, “The convenience store staff have good manners even though they are busy.”). From the remaining Logistics Service Quality scale, no misfitting items were demonstrated. All items from the scales showed good fit after misfitting items had been removed.

Table 4.6 Item location and fit for Logistics Service Quality

Items	Four Subscales for LSQ				LSQ Total Scale			
	Measure	S.E.	Infit MNSQ	Outfit MNSQ	Measure	S.E.	Infit MNSQ	Outfit MNSQ
Information Quality								
LSQ1	0.06	0.05	1.04	0.96	-0.02	0.04	1.18	1.20
LSQ2	-0.16	0.05	1.02	0.92	-0.28	0.04	1.16	1.12
LSQ3	-0.06	0.05	1.09	0.97	-0.16	0.04	1.21	1.19
LSQ4	0.16	--	0.95	1.05	0.09	0.04	1.28	1.32
Timeliness								
LSQ5	0.14	0.04	0.67	0.55	--	--	--	--
LSQ6	0.11	0.04	1.01	0.90	0.38	0.04	1.16	1.18
LSQ7	-0.25	--	1.19	1.37	0.00	0.04	1.02	1.06
Order Condition								
LSQ8	-0.168	0.045	1.03	0.88	-0.44	0.05	1.24	1.18
LSQ9	-0.25	0.045	0.92	0.80	-0.59	0.05	1.19	1.14
LSQ10	0.22	0.04	0.29	0.28	--	--	--	--
LSQ11	0.42	--	1.03	1.19	0.16	0.04	0.93	1.03
Personnel Contact Quality								
LSQ12	-0.12	0.05	0.87	0.82	0.17	0.04	0.84	0.89
LSQ13	-0.23	0.05	0.74	0.7	0.07	0.04	0.72	0.75
LSQ14	-0.01	0.05	0.68	0.66	--	--	--	--
LSQ15	0.35	--	1.24	1.3	0.61	--	0.92	0.91

*Infit/Outfit <0.7 and Infit/Outfit > 1.3 are highlighted in bold.

**Table shows final item locations for scales when misfitting items have been removed, as well as initial fit statistics and parameters for those misfitting items.

4.3 Reliability and Validity Analyses

4.3.1 Reliability Test

In this section, the reliability of research constructs was also tested. Reliability refers to the consistency of a measure, whereas internal consistency is that the individual items of a scale should be measuring the same construct and be highly interrelated. The most commonly ways of testing internal consistency are computing Cronbach's alpha and item-to-total correlation. When the item-to-total correlation is above 0.4 and the reliability coefficient alpha value is above 0.7, the items demonstrate high internal consistency and hence reliability of each dimension (Nunnally and Bernstein, 1994). This study adopted the total sample (n=3132) to test if the measure scales are reliable.

Table 4.7 shows the internal consistency for all research constructs. All items within a factor or a construct have a high coefficient of item-to-total correlation

(0.421 – 0.873), and this suggests a high degree of internal consistency for each dimension. Furthermore, the Cronbach's alpha value of each construct is high (0.787 – 0.926), which confirms the consistency of the measurement variables.

Table 4.7 Results of Reliability Tests

Items	Description	Item-to-Total Correlation	Cronbach's alpha
E-Service Quality – Ease of Use			
ESQ1	I can find the books what I need by using search engine easily.	0.665	0.953
ESQ2	The site records all the books I have ever browsed, and it allows me to browse them again conveniently.	0.639	
ESQ3	The hyperlinks make it convenient to browse the books that interest me.	0.723	
ESQ6	The site is simple to use.	0.621	
E-Service Quality – Privacy			
ESQ7	There are special measures for protecting information about my on-line transaction.	0.65	0.802
ESQ9	Advertisements will not be mailed to me without my permission	0.578	
ESQ10	The site has passed a security review and has the secure symbols.	0.731	
E-Service Quality – Design			
ESQ11	The site is attractively designed and is visually pleasing.	0.752	0.86
ESQ12	The display of objectives and graphics is appealed.	0.777	
ESQ14	The text and graphics are clear and easy to understand.	0.679	
E-Service Quality – Information			
ESQ15	The information about books is accurate.	0.729	0.894
ESQ16	The site provides information about new books.	0.779	
ESQ17	The site provides information about best-selling books.	0.761	
ESQ18	The information about books is sufficient.	0.705	
ESQ19	The site will send an e-mail or message to me to confirm my book order.	0.637	
ESQ21	The site provides complete illustrations for returning and changing books.	0.693	
E-Service Quality – Functionality			
ESQ22	The site loads its pages quickly.	0.668	0.837
ESQ23	It provides the functions for interaction.	0.711	
ESQ24	It gives me numerous options of merchandise other than books.	0.634	
ESQ25	It provides numerous premiums, like bonuses and e-coupon.	0.581	
ESQ27	It gives me numerous options for delivery.	0.613	

Items	Description	Item-to-Total Correlation	Cronbach's alpha
Logistics Service Quality – Information Quality			
LSQ1	The e-map interface lets me choose a pick-up point conveniently.	0.837	0.889
LSQ2	It gives me numerous options to choose the pick-up point.	0.866	
LSQ3	The information of convenience stores on the e-map is accurate.	0.829	
LSQ4	After my books arrived at the convenience store, it will send a message to remind me to pick up the books.	0.53	
Logistics Service Quality – Timeliness			
LSQ6	Time between ordering books and receiving books is short.	0.745	0.851
LSQ7	Books arrive on the date promised.	0.745	
Logistics Service Quality – Order Condition			
LSQ8	It reliably delivers my books to the convenience store I chose.	0.733	0.817
LSQ9	When I pick-up the books I ordered, the bar code information is accurate and can be read.	0.744	
LSQ11	The books I received are undamaged.	0.57	
Logistics Service Quality – Personnel Contact Quality			
LSQ12	When I pick up, the convenience store staff can quickly find the books I ordered.	0.771	0.879
LSQ13	When I pick up, the convenience store staff have good manners.	0.814	
LSQ15	When there is a problem with delivery, the convenience store staff can immediately tell me what to do.	0.724	
Perceived Sacrifice			
SAC1	I think the prices charged for ordering books from this on-line bookstore are reasonable.	0.611	0.832
SAC2	I think ordering books in this on-line bookstore does not take much time.	0.751	
SAC3	I think ordering books in this on-line bookstore is easy.	0.726	
Service Value			
VAL1	I think that the service provided by this on-line bookstore compared to the price I had to pay is acceptable.	0.775	0.898
VAL2	I think that it is more worthwhile to use this on-line bookstore than others.	0.792	
VAL3	Compared to the price, I think the service provided by this on-line bookstore is very valuable.	0.828	
Customer Satisfaction			
SAT1	In general, the service from this on-line bookstore conformed to my expectations.	0.85	0.926
SAT2	In general, I am satisfied with the service that this on-line bookstore provided.	0.873	
SAT3	Shopping on this on-line bookstore is a wise decision.	0.826	

Items	Description	Item-to-Total Correlation	Cronbach's alpha
Switching Costs			
SC1	I am used to choosing the same on-line bookstore to order books.	0.421	0.787
SC2	I feel troublesome about some procedures for joining a new on-line bookstore to order books.	0.56	
SC3	If I choose another on-line bookstore, the pick-up place is not convenient for me.	0.605	
SC4	If I choose another on-line bookstore, I will lose some premiums.	0.553	
SC5	If I choose another on-line bookstore, I need to spend some effort to know the service well.	0.685	
Customer Loyalty			
LOY1	I will recommend this on-line bookstore to my friends.	0.775	0.89
LOY2	If I want to buy books, I will choose this on-line bookstore first.	0.803	
LOY3	I am willing to do other business in this on-line bookstore.	0.687	
LOY4	Compare to other on-line bookstores, I prefer this on-line bookstore.	0.775	

4.3.2 Validity Assessment

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. In addition to the reliability test, the validity for the variables was explored by confirmatory factor analysis (CFA). Standardized factor loading and t-value are estimated to display validity, and the average variance extracted is also estimated to display validity. If the item is significant at the 0.01 level and the average variance extracted is greater than 0.5, the convergent validity can be assessed. This study employed the total sample (n=3132) to test if the measure scales are valid.

1. E-Service Quality

In this construct, there were five factors including Ease of Use, Privacy, Design, Information, and Functionality. A second-order CFA is used for validity analysis. Figure 4.1 depicts the path diagram of this second-order CFA for E-service quality. The fit measure of RMR is below the recommended cutoff value of 0.05. Although the values of GFI and AGFI are less than 0.9, the NFI, NNFI, and CFI values are greater than 0.9. Thus the measurement model fits the data well.

Table 4.8 shows that all standardized factor loadings are greater than 0.4, and all of the items are significant at the 0.01 level. All composite reliability values greater than 0.8 and all average variance extracted values exceed the threshold of 0.5. These results described that E-Service Quality has good validity.

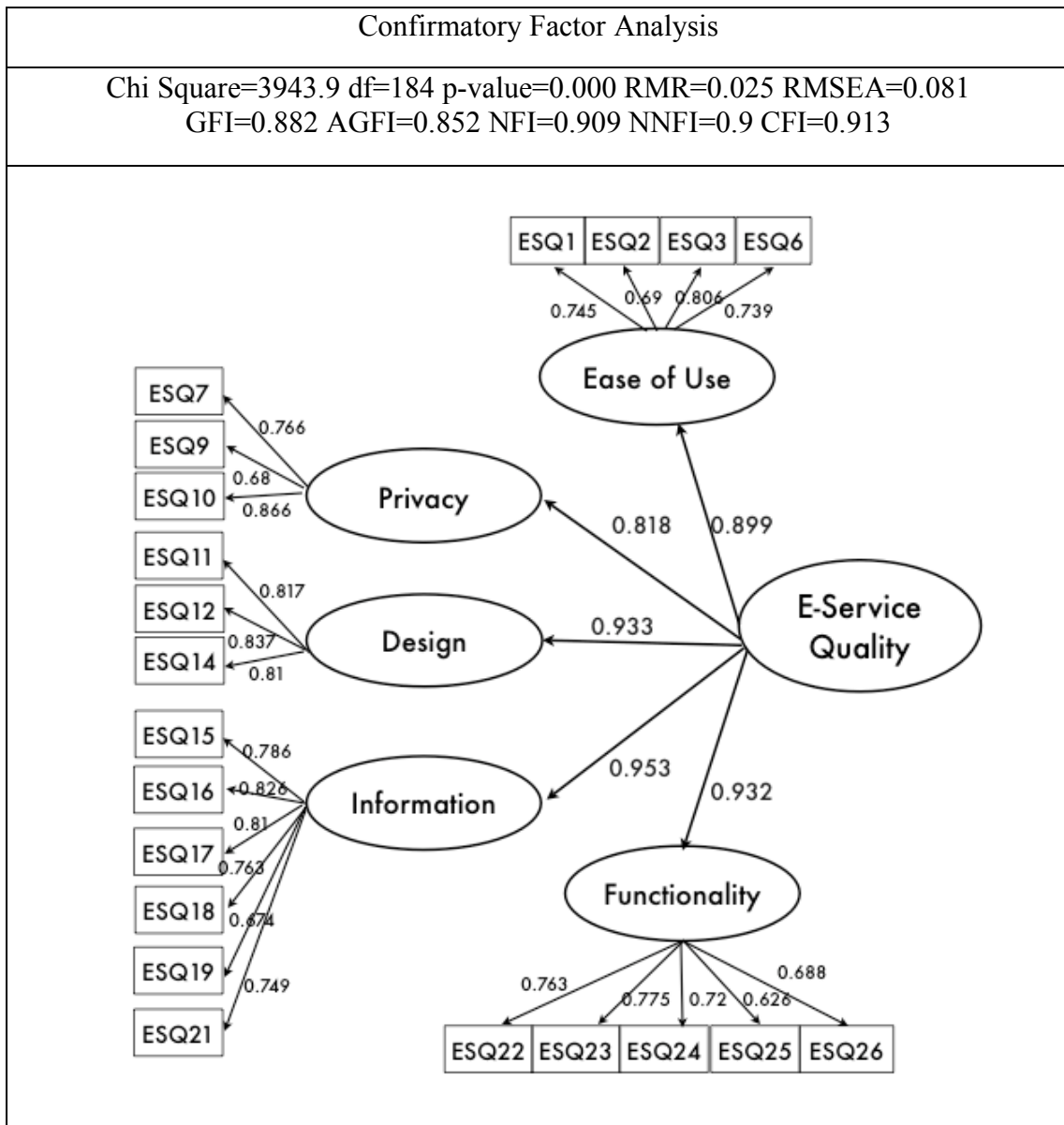


Figure 4.1 Confirmatory Factor Analysis of E-Service Quality

Table 4.8 Confirmatory Factor Analysis of E-Service Quality

Factor	Loading	Item	Loading	Composite Reliability	Average Variance Extracted	Cronbach's alpha
Ease of Use	0.899	ESQ1	0.745	0.8336	0.5567	0.831
		ESQ2	0.69			
		ESQ3	0.806			
		ESQ6	0.739			
Privacy	0.818	ESQ7	0.766	0.8166	0.5997	0.802
		ESQ9	0.68			
		ESQ10	0.866			

Factor	Loading	Item	Loading	Composite Reliability	Average Variance Extracted	Cronbach's alpha
Design	0.933	ESQ11	0.817	0.8615	0.6747	0.86
		ESQ12	0.837			
		ESQ14	0.81			
Information	0.953	ESQ15	0.786	0.8967	0.5923	0.894
		ESQ16	0.826			
		ESQ17	0.81			
		ESQ18	0.763			
		ESQ19	0.674			
		ESQ21	0.749			
Functionality	0.932	ESQ22	0.763	0.8398	0.5133	0.837
		ESQ23	0.775			
		ESQ24	0.72			
		ESQ25	0.626			
		ESQ27	0.688			

2. Logistics Service Quality

Similar to E-Service Quality, this construct has four factors including, Information Quality, Timeliness, Order Condition, and Personnel Contact Quality, and a second-order CFA was applied for examining validity. Figure 4.2 shows the path diagram of this second-order CFA for logistics service quality. The fit measures like RMR, GFI, NFI, NNFI, and CFI are all above the recommended level, so the measurement model fits the data well.

Table 4.9 presents that all items have standardized factor loadings greater than 0.4, and all them are significant at the 0.01 level. The values of composite reliability are greater than 0.8 and all average variance extracted values exceed 0.6. These results described that Logistics Service Quality has good validity.

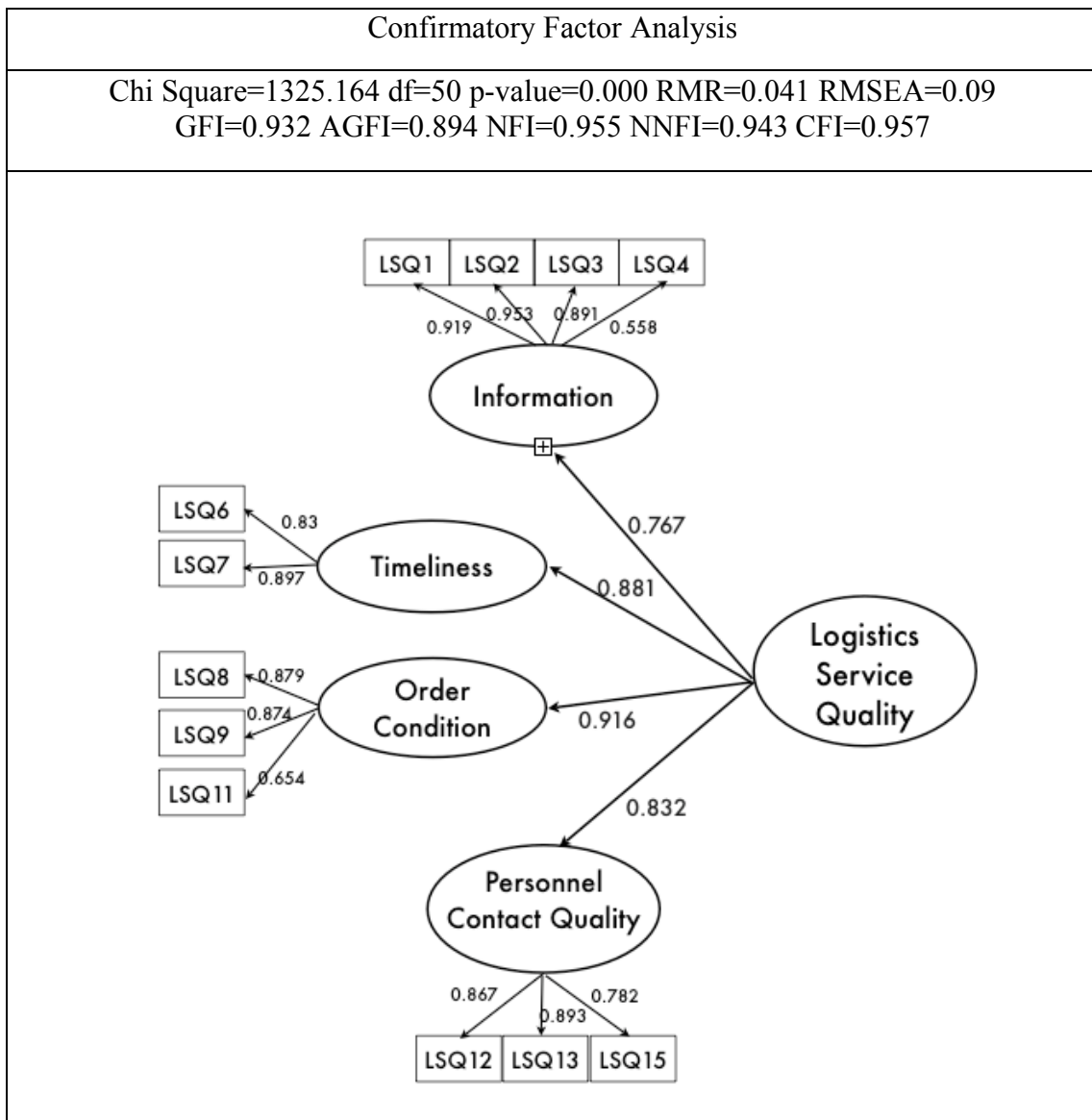


Figure 4.2 Confirmatory Factor Analysis of Logistics Service Quality

Table 4.9 Confirmatory Factor Analysis of Logistics Service Quality

Factor	Loading	Item	Loading	Composite Reliability	Average Variance Extracted	Cronbach's alpha
Information Quality	0.767	LSQ1	0.919	0.9062	0.7145	0.889
		LSQ2	0.953			
		LSQ3	0.891			
		LSQ4	0.558			
Timeliness	0.881	LSQ6	0.83	0.8548	0.7468	0.851
		LSQ7	0.897			
Order Condition	0.916	LSQ8	0.879	0.8483	0.6547	0.817
		LSQ9	0.874			
		LSQ11	0.654			

Factor	Loading	Item	Loading	Composite Reliability	Average Variance Extracted	Cronbach's alpha
Personnel Contact Quality	0.832	LSQ12	0.867	0.885	0.7202	0.879
		LSQ13	0.893			
		LSQ15	0.782			

Other constructs such as Perceived Sacrifice, Service Value, Customer Satisfaction, Switching Costs, and Customer Loyalty were examined by first-order CFA. Table 4.10 demonstrates that all standardized factor loadings are greater than 0.4, and all items are significant at the 0.01 level. Composite reliability values for all constructs are greater than 0.7, and all values of average variance extracted are greater than 0.5 except the construct of Switching Costs (0.436). Since the value of average variance extracted of Switching Costs is somewhat less than the cutoff value (0.5), it is not far from the threshold, the construct still has adequate validity.

Table 4.10 Confirmatory Factor Analysis of Other Constructs

Construct	Item	Loading	Composite Reliability	Average Variance Extracted	Cronbach's alpha
Perceived Sacrifice	SAC1	0.723	0.8508	0.6565	0.832
	SAC2	0.847			
	SAC3	0.854			
Service Value	VAL1	0.84	0.8987	0.7476	0.898
	VAL2	0.842			
	VAL3	0.91			
Customer Satisfaction	SAT1	0.907	0.9272	0.8095	0.926
	SAT2	0.926			
	SAT3	0.865			
Switching Costs	SC1	0.461	0.7894	0.436	0.787
	SC2	0.643			
	SC3	0.7			
	SC4	0.631			
	SC5	0.816			
Customer Loyalty	LOY1	0.835	0.8928	0.6766	0.89
	LOY2	0.882			
	LOY3	0.725			
	LOY4	0.84			

4.4 Structural Equation Modeling

The purpose of this study is to examine the relationships among e-service quality, logistics service quality, perceived sacrifice, service value, customer satisfaction, switching costs, and customer loyalty in the context of on-line bookstores. Furthermore, it compares the relationships among these constructs in BOOKS.com with KingStone on-line bookstore to find the differences between them. To achieve these goals, structural equation modeling (SEM) was performed using AMOS to test the hypotheses in the research model. The BOOKS.com sample ($n_1=950$) and KingStone sample ($n_2=942$) were both employed for SEM.

4.4.1 Model Test

The overall model fit of BOOKS.com sample and KingStone sample are shown in Table 4.11. The chi-square of the model for BOOKS.com sample is 5358.935 with 1204 degree of freedom at significant level of 0.000. The value of chi-square/df is 4.451, and it falls below the upper limit of 5.00. Although the RMR value exceeds the threshold value of 0.05, the RMSEA value is below the threshold value of 0.08. Other fit indices like GFI, AGFI, NFI, NNFI, and CFI are less than the recommended level of 0.9. These results also show that the model may not fit the BOOKS.com sample data well enough. Though these indices are not far from 0.9, the results can be accepted.

The chi-square value for the KingStone sample is significant at the 0.00 level, and the chi-square/df is 4.678 which is below the limit of 5.00. Although the value of RMR is not acceptable, the RMSEA value is less than the threshold. Other indices are below the recommended level, and these results describe that the model may not fit the KingStone sample very well. Though the fit indices are not far from the recommended level, the results still can be accepted.

Table 4.11 Overall Model Fit of Research Model for BOOKS.com Sample and KingStone Sample

Fit Measures	Criteria	Results of BOOKS.com	Acceptability	Results of KingStone	Acceptability
Chi-square (df)	P>0.05	5358.935 (1204)	Not Accepted	5632.361 (1204)	Not Accepted
Chi-square/df	<5.00	4.451	Accepted	4.678	Accepted
RMR	<0.05	0.136	Not Accepted	0.145	Not Accepted
RMSEA	<0.08	0.06	Accepted	0.063	Accepted
GFI	>0.9	0.803	Not Accepted	0.793	Not Accepted
AGFI	>0.9	0.783	Not Accepted	0.772	Not Accepted
NFI	>0.9	0.849	Not Accepted	0.854	Not Accepted
NNFI	>0.9	0.872	Not Accepted	0.874	Not Accepted
CFI	>0.9	0.879	Not Accepted	0.881	Not Accepted

For the BOOKS.com sample, Table 4.12 displays that all standardized factor loadings are within the recommended range (between 0.50 and 0.95) except LSQ4 and SC1, and all of them are significant at 0.05 level. Since the factor loadings of LSQ4 (0.475) and SC1 (0.419) are not far from the lower level of 0.5, the results can be accepted. Table 4.2 also shows that the composite reliability of all constructs are greater than the suggested value of 0.7 and the average variance extracted of all constructs are over 0.5 except for Switching Costs (0.4208). Moreover, each construct has large coefficients of Cronbach's alpha, indicating that the research model for BOOKS.com sample achieves superior fit for internal structure.

And for the KingStone sample, Table 4.13 also shows that all standardized factor loadings are between 0.50 and 0.95 except for Information and SC1 and all of them are significant at the 0.05 level. Since the factor loadings of Information (0.954) and SC1 (0.442) are not far from the recommended range, the results can be accepted. Furthermore, Table 4.13 presents that the composite reliability of all constructs are over 0.7 and the average variance extracted for all constructs exceed the suggested value of 0.5 except for Switching Costs (0.4526). In addition, the coefficients of Cronbach's alpha for each construct is greater than 0.7, indicating the research model for the KingStone sample achieves superior fit for internal structure.

Table 4.12 Fit of Internal Structure of Research Model for BOOKS.com Sample

Constructs	Factors	Factor Loading	Items	Factor Loading	Average Variance Extracted	Composite Reliability	Cronbach's alpha
E-Service Quality	Ease of Use	0.876	ESQ1	0.75	0.8087	0.9547	0.948
			ESQ2	0.618			
			ESQ3	0.772			
			ESQ6	0.737			
	Privacy	0.799	ESQ7	0.783			
			ESQ9	0.627			
			ESQ10	0.872			
	Design	0.936	ESQ11	0.798			
			ESQ12	0.807			
			ESQ14	0.832			
	Information	0.95	ESQ15	0.792			
			ESQ16	0.821			
			ESQ17	0.813			
			ESQ18	0.768			
ESQ19			0.688				
ESQ21			0.747				
Functionality	0.927	ESQ22	0.762				
		ESQ23	0.72				
		ESQ24	0.724				
		ESQ25	0.557				
		ESQ26	0.69				
		ESQ27	0.69				
Logistics Service Quality	Information Quality	0.8	LSQ1	0.903	0.7125	0.9081	0.926
			LSQ2	0.942			
			LSQ3	0.871			
			LSQ4	0.475			
	Timeliness	0.903	LSQ6	0.817			
			LSQ7	0.871			
	Order Condition	0.875	LSQ8	0.903			
			LSQ9	0.899			
			LSQ11	0.575			
	Personnel Contact Quality	0.793	LSQ12	0.85			
LSQ13			0.884				
LSQ15			0.78				
Perceived Sacrifice	---	---	SAC1	0.595	0.5914	0.8089	0.787
			SAC2	0.885			
			SAC3	0.798			

Constructs	Factors	Factor Loading	Items	Factor Loading	Average Variance Extracted	Composite Reliability	Cronbach's alpha
Service Value	---	---	VAL1	0.778	0.6712	0.8595	0.891
			VAL2	0.822			
			VAL3	0.856			
Customer Satisfaction	---	---	SAT1	0.864	0.7565	0.9031	0.924
			SAT2	0.889			
			SAT3	0.856			
Switching Costs	---	---	SC1	0.419	0.4208	0.7779	0.774
			SC2	0.636			
			SC3	0.677			
			SC4	0.655			
			SC5	0.798			
Customer Loyalty	---	---	LOY1	0.813	0.5748	0.8433	0.877
			LOY2	0.799			
			LOY3	0.678			
			LOY4	0.735			

Table 4.13 Fit of Internal Structure of Research Model for KingStone Sample

Constructs	Factors	Factor Loading	Items	Factor Loading	Average Variance Extracted	Composite Reliability	Cronbach's alpha
E-Service Quality	Ease of Use	0.908	ESQ1	0.76	0.8255	0.9593	0.956
			ESQ2	0.747			
			ESQ3	0.825			
			ESQ6	0.741			
	Privacy	0.821	ESQ7	0.759			
			ESQ9	0.697			
			ESQ10	0.874			
	Design	0.931	ESQ11	0.805			
			ESQ12	0.84			
			ESQ14	0.794			
	Information	0.954	ESQ15	0.788			
			ESQ16	0.838			
			ESQ17	0.826			
			ESQ18	0.765			
			ESQ19	0.681			
Functionality	0.923	ESQ21	0.741				
		ESQ22	0.753				
		ESQ23	0.785				
		ESQ24	0.71				
		ESQ25	0.71				
			ESQ27	0.718			

Constructs	Factors	Factor Loading	Items	Factor Loading	Average Variance Extracted	Composite Reliability	Cronbach's alpha
Logistics Service Quality	Information Quality	0.761	LSQ1	0.919	0.7256	0.9132	0.938
			LSQ2	0.961			
			LSQ3	0.91			
			LSQ4	0.606			
	Timeliness	0.893	LSQ6	0.838			
			LSQ7	0.894			
	Order Condition	0.914	LSQ8	0.885			
			LSQ9	0.887			
			LSQ11	0.659			
	Personnel Contact Quality	0.831	LSQ12	0.85			
LSQ13			0.891				
LSQ15			0.739				
Perceived Sacrifice	---	---	SAC1	0.706	0.6644	0.8548	0.844
			SAC2	0.864			
			SAC3	0.865			
Service Value	---	---	VAL1	0.745	0.6638	0.855	0.887
			VAL2	0.82			
			VAL3	0.874			
Customer Satisfaction	---	---	SAT1	0.88	0.7589	0.9042	0.927
			SAT2	0.883			
			SAT3	0.85			
Switching Costs	---	---	SC1	0.442	0.4526	0.7991	0.797
			SC2	0.612			
			SC3	0.764			
			SC4	0.66			
			SC5	0.821			
Customer Loyalty	---	---	LOY1	0.812	0.6165	0.8646	0.89
			LOY2	0.835			
			LOY3	0.671			
			LOY4	0.812			

4.4.2 Path Results

There are eleven direct paths in the research model. Table 4.12 shows the results of these paths for the two samples. In the BOOKS.com sample, except for the paths of E-Service Quality to Customer Loyalty and Logistics Service Quality to Customer Loyalty, each relationship between paired constructs is positive and significant. And in the KingStone sample, all paths are positive and significant except for the path of Switching Costs to Customer Loyalty. And Figure 4.3 and 4.4 also show the path results for the two samples.

Table 4.14 Path Results of Research Model for BOOKS.com Sample and KingStone Sample

	BOOKS.com		KingStone	
	Standardized Estimate	t-value	Standardized Estimate	t-value
E-Service Quality -> Service Value	0.358**	10.573	0.253**	7.953
Logistics Service Quality -> Service Value	0.317**	9.494	0.4**	11.648
Perceived Sacrifice -> Service Value	0.375**	10.275	0.394**	11.502
E-Service Quality -> Customer Satisfaction	0.071**	2.805	0.098**	4.243
Logistics Service Quality -> Customer Satisfaction	0.141**	5.515	0.142**	5.562
Service Value -> Customer Satisfaction	0.789**	23.162	0.797**	24.769
E-Service Quality -> Customer Loyalty	-0.013	-0.541	0.107**	4.471
Logistics Service Quality -> Customer Loyalty	0.031	1.284	0.085**	3.206
Service Value -> Customer Loyalty	0.158**	2.848	0.124*	1.96
Customer Satisfaction -> Customer Loyalty	0.773**	12.702	0.693**	9.962
Switching Costs -> Customer Loyalty	0.087**	3.766	0.019	0.815

Note: **t-value > 2.58; p-value < 0.001 and *t-value > 1.96; p-value < 0.05

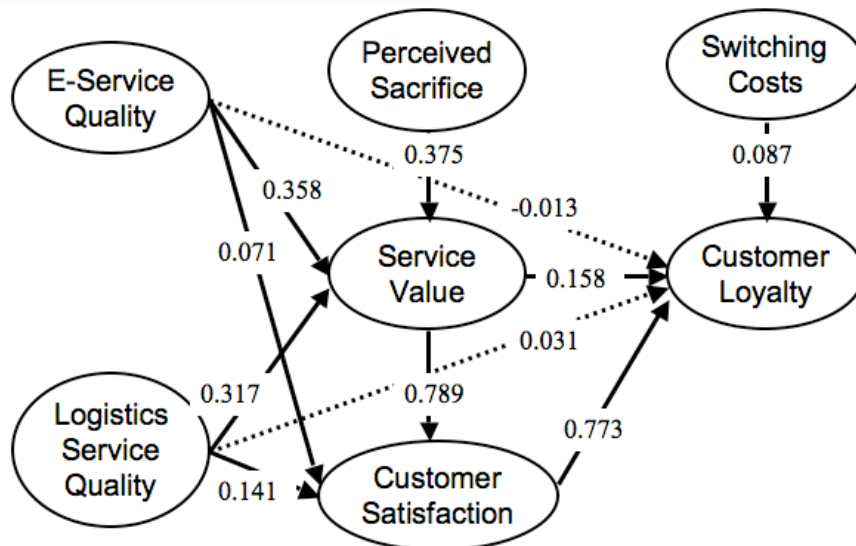


Figure 4.3 Path Results of Research Model for BOOKS.com Sample

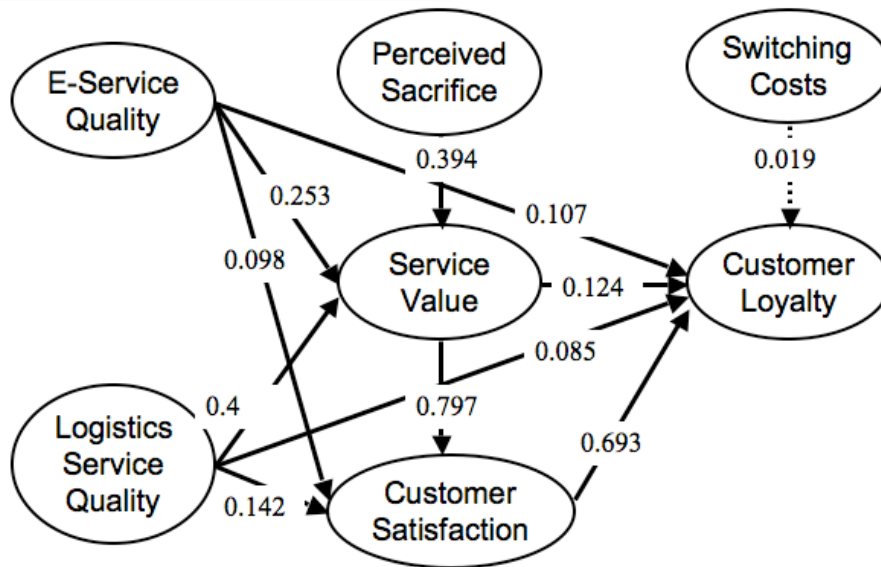


Figure 4.4 Path Results of Research Model for KingStone Sample

4.4.3 Effects Analysis

Three kinds of effects including direct effect, indirect effect, and total effect between research constructs were analyzed. Total effect is the sum of direct and indirect effects. And Table 4.13 shows these three kinds of effects between the constructs for BOOKS.com sample and KingStone sample.

◆ Direct Effects

In the BOOKS.com sample, e-service quality, logistics service quality, and perceived sacrifice have direct effect only on service value (0.358, 0.317, and 0.375). Besides, service value exhibits a stronger direct influence on customer satisfaction than e-service quality and logistics service quality do ($0.789 > 0.071$; $0.789 > 0.141$). Moreover, customer satisfaction has greater impact on customer loyalty than service value and switching costs do ($0.773 > 0.158$; $0.773 > 0.087$).

In the KingStone sample, e-service quality, logistics service quality, and perceived sacrifice have direct effect only on service value (0.253, 0.4, and 0.394). Besides, service value exhibits a stronger direct influence on customer satisfaction than e-service quality and logistics service quality do ($0.797 > 0.098$; $0.797 > 0.142$). Customer satisfaction has greater impact on customer loyalty than e-service quality, logistics service quality, and service value do ($0.693 > 0.107$; $0.693 > 0.085$; $0.693 > 0.124$).

Table 4.15 Path Effects of Research Constructs for BOOKS.com Sample and KingStone Sample

Constructs	BOOKS.com			KingStone		
	Direct Effects	Indirect Effects	Total Effects	Direct Effects	Indirect Effects	Total Effects
Service Value						
E-Service Quality	0.358	--	0.358	0.253	--	0.253
Logistics Service Quality	0.317	--	0.317	0.4	--	0.4
Perceived Sacrifice	0.375	--	0.375	0.394	--	0.394
Customer Satisfaction						
E-Service Quality	0.071	0.283	0.353	0.098	0.202	0.3
Logistics Service Quality	0.141	0.25	0.392	0.142	0.319	0.461
Perceived Sacrifice	--	0.296	0.296	--	0.314	0.314
Service Value	0.789	--	0.789	0.797	--	0.797
Customer Loyalty						
E-Service Quality	-0.013	0.33	0.33	0.107	0.239	0.346
Logistics Service Quality	0.031	0.353	0.353	0.085	0.369	0.455
Perceived Sacrifice	--	0.288	0.288	--	0.267	0.267
Service Value	0.158	0.61	0.768	0.124	0.553	0.677
Customer Satisfaction	0.773	--	0.773	0.693	--	0.693
Switching Costs	0.087	--	0.087	0.019	--	0

Note: Effects not significant at 0.05 level are highlight in bold.

◆ Indirect Effects

E-service quality, logistics service quality, and perceived sacrifice have indirect effects on customer satisfaction via service value (i.e., ESQ→VAL→SAT; LSQ→VAL→SAT; SAC→VAL→SAT). And e-service quality, logistics service quality, perceived sacrifice, and service value have indirect effects on customer loyalty through service value and customer satisfaction.

In the BOOKS.com sample, the indirect effects of e-service quality, logistics service quality, and perceived sacrifice on customer satisfaction are 0.283, 0.25, and 0.296. The indirect effects of e-service quality on customer loyalty are aggregation of standardized coefficients from 3 indirect routes: (1) ESQ→VAL→LOY (0.057); (2) ESQ→SAT→LOY (0.055); (3) ESQ→VAL→SAT→LOY (0.218). Therefore, the indirect effects of e-service quality on customer loyalty are 0.33. In addition, the indirect effects of logistics service quality, perceived sacrifice, and service value on customer loyalty are 0.353 (LSQ→VAL→LOY; LSQ→SAT→LOY; LSQ→VAL→SAT→LOY), 0.288 (SAC→VAL→LOY; SAC→SAT→LOY; SAC→VAL→SAT→LOY), and 0.61 (VAL→SAT→LOY).

And in the KingStone sample, the indirect effects of e-service quality, logistics service quality, and perceived sacrifice on customer satisfaction are 0.202, 0.319, and 0.314. Besides, the indirect effects of e-service quality, logistics service quality, perceived sacrifice, and service value on customer loyalty are 0.239, 0.369, 0.267, and 0.553.

◆ Total Effects

For the BOOKS.com sample, in regard to the impact on customer satisfaction, service value (0.789) has superior total effect effects than e-service quality (0.283), logistics service quality (0.25), and perceived sacrifice (0.296). Likewise, service value (0.768) and customer satisfaction (0.773) exhibit higher total effects on customer loyalty than e-service quality (0.33), logistics service quality (0.353), perceived sacrifice (0.288), and switching costs (0.087). For the KingStone sample, results of the total effects for customer satisfaction and customer loyalty are similar to the BOOKS.com sample. These findings highlight the importance of the intermediate role of service value and customer satisfaction in the research model.

4.5 Importance-Performance Analysis

Importance-Performance Analysis (IPA) is a simple and useful technique for identifying those attributes of a product or service that are most in need of improvement or that are candidates for possible cost-saving conditions without significant detriment to overall quality. The application of IPA, introduced by Martilla and James (1977) is well documented and has shown the capability to provide service managers with valuable information for both satisfaction measurement and the efficient allocation of resources in an easily applicable format.

IP maps highlight the relative positions of attributes in matrix format, with the importance values on the vertical axis and performance values on the horizontal axis. E-service quality and logistics service quality questionnaire items are classified into quadrants as shown in the graph: quadrant I (improvement reinforcement area), quadrant II (maintenance reinforcement area), quadrant III (secondary improvement area) and quadrant IV (over-emphasized area).

Figures 4.5 and 4.6 show the IP maps of e-service quality and logistics service quality for BOOKS.com sample. As shown in Figure 4.5, most of the e-service quality items fall in quadrants II (keep up the good work) and III (low priority), and only a few are in quadrants I (concentrate here) and IV (possible overkill). Therefore, BOOKS.com should maintain the advantage of quadrant II, and their

resource allocation should be changed from quadrant IV to quadrant I (ESQ18-information, ESQ22-functionality, and ESQ25-functionality). And as Figure 4.6 shows, most of the logistics service quality items fall in quadrants III and IV, and others are in quadrants I (LSQ11-order condition and LSQ15-personnel contact quality) and II (LSQ7-timeliness and LSQ8-order condition). The 7-11.com RD service provided by BOOKS.com should maintain the advantage of quadrant II, and their resource allocation should be changed from quadrant IV to quadrant I .

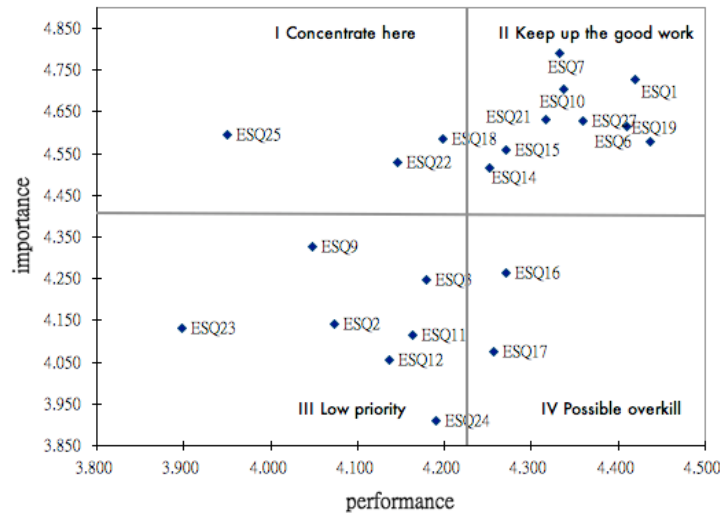


Figure 4.5 Importance-Performance Map of E-Service Quality for BOOKS.com Sample

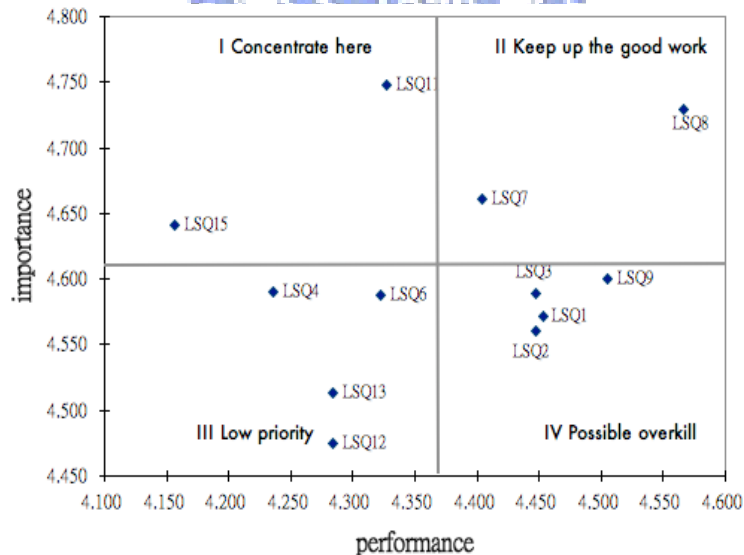


Figure 4.6 Importance-Performance Map of Logistics Service Quality for BOOKS.com Sample

Figures 4.7 and 4.8 show the IP maps of e-service quality and logistics service quality for the KingStone sample. As shown in Figure 4.7, most of the e-service quality items fall in quadrants II, III, and IV, and a few are in quadrant I (ESQ7-privacy, ESQ14-design, ESQ18-information, and ESQ22-functionality). Therefore, KingStone on-line bookstore should maintain the advantage of quadrant II, and some of their resource allocation should be shifted from quadrant IV to quadrant I. And as Figure 4.8 shows, the CVS.com RD service provided by KingStone on-line bookstore should maintain its advantage of quadrant II (LSQ4-information quality, LSQ8-order condition, LSQ9-order condition, and LSQ11-order condition), and their resource allocation should be changed from quadrant IV to quadrant I (LSQ6-timeliness, LSQ7-timeliness, and LSQ15-personnel contact quality).

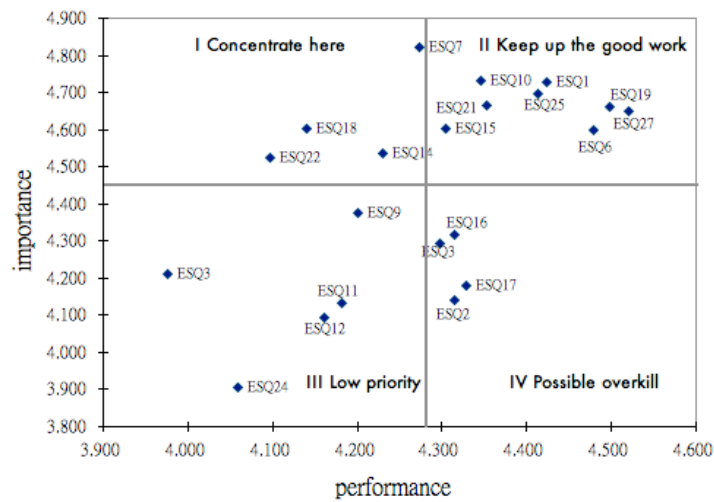


Figure 4.7 Importance-Performance Map of E-Service Quality for KingStone Sample

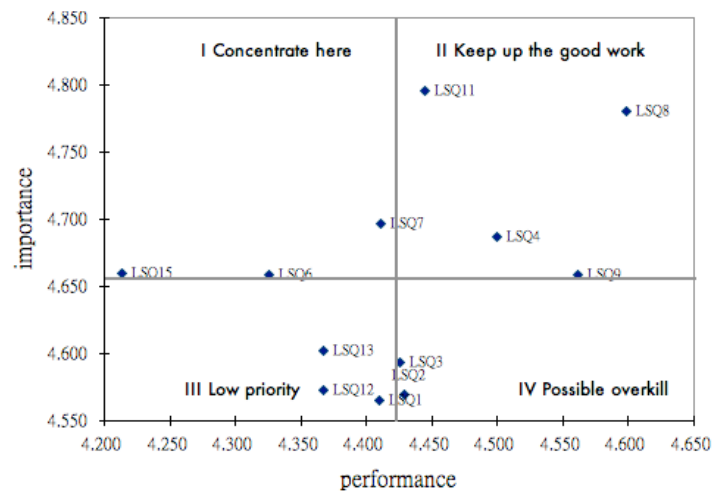


Figure 4.8 Importance-Performance Map of Logistics Service Quality for KingStone Sample

CHAPTER 5 CONCLUSIONS AND SUGGESTIONS

This chapter summarizes the results of the empirical study as well as some managerial in the first section. Finally, suggestions and limitations of this research for future research are provided in the last part of this chapter.

5.1 Research Conclusions

The main objective of this study is to investigate the relationships among e-service quality, logistics service quality, perceived sacrifice, service value, customer satisfaction, switching costs and customer loyalty of on-line bookstores regarding retailing delivery service. Furthermore, we compare the relationships among these constructs in BOOKS.com sample with KingStone sample, and then determine the differences between these two on-line bookstores. Based on the data analyses discussed in chapter four, the results of research hypotheses are summarized in Table 5.1.

For the BOOKS.com sample, the analysis finds that all hypotheses are supported at the 0.05 significance level except for hypothesis seven and eight. That is e-service quality of on-line bookstores and logistics service quality of retailing delivery have no significant effect on customer loyalty for the BOOKS.com sample. For the KingStone sample, the analysis finds that hypothesis one to ten are supported at the 0.05 significance level, and hypothesis eleven is not supported. And that is switching costs have no significant effect on customer loyalty for the KingStone sample.

Table 5.1 Summary of Hypotheses Testing

Research Hypotheses		Results	
		BOOKS.com	KingStone
H1	E-service quality of on-line bookstores has a significant positive effect on perceived service value.	Supported	Supported
H2	Logistics service quality of retailing delivery has a significant positive effect on perceived service value.	Supported	Supported
H3	Perceived sacrifice has a significant positive effect on perceived service value.	Supported	Supported

Research Hypotheses		Results	
		BOOKS.com	KingStone
H4	E-service quality of on-line bookstores has a significant positive effect on customer satisfaction.	Supported	Supported
H5	Logistics service quality of retailing delivery has a significant positive effect on customer satisfaction.	Supported	Supported
H6	Perceived service value has a significant positive effect on customer satisfaction.	Supported	Supported
H7	E-service quality of on-line bookstores has a significant positive effect on customer loyalty.	Not Supported	Supported
H8	Logistics service quality of retailing delivery has a significant positive effect on customer loyalty.	Not Supported	Supported
H9	Perceived service value has a significant positive effect on customer loyalty.	Supported	Supported
H10	Customer satisfaction has a significant positive effect on customer loyalty.	Supported	Supported
H11	Switching costs has a significant positive effect on customer loyalty.	Supported	Not Supported

As the results, hypothesis seven and eight are supported in the KingStone sample, but not supported in the BOOKS.com sample. And hypothesis eleven is supported in the BOOKS.com sample, but not supported in the KingStone sample. These differences between BOOKS.com sample and KingStone sample of the hypotheses testing may indicate their distinguishing characteristic. BOOKS.com is the oldest, best known and popular on-line bookstore in Taiwan, and it controls the largest market share. Furthermore, it was the first on-line bookstore that provides retailing delivery service. On the other side, KingStone was originally a physical bookstore, and it established its on-line bookstore in 1997. Consequently, the KingStone on-line bookstore is less popular with customers than the BOOKS.com on-line bookstore. In order to increase its market share, KingStone on-line bookstore must compete with BOOKS.com, and should do some services much better than it.

Because BOOKS.com is well-known and powerful, it may be the first choice for many customers. Compared to the KingStone on-line bookstore, its website service quality and the retailing delivery service quality may be less important and the effects to customer loyalty may be not so direct as KingStone. In addition, KingStone on-line bookstore is the second brand for customers. In order to increase its customer loyalty, KingStone should emphasize the website service quality and retailing delivery service quality, and should provide these services much better than BOOKS.com. The above-mention may explain why hypothesis seven and eight are supported in KingStone sample, but not supported in BOOKS.com sample.

When switching costs are high, they can help maintain the loyalty of unsatisfied customers; and when they are low, satisfied customers may be less loyal.

In general, higher switching costs may have a significant positive effect on customer loyalty, and this is supported in the BOOKS.com sample but not in the KingStone sample. One aspect to the influence of switching costs on customer loyalty is “Alternative Attractiveness”, and it may have a negative effect on customer loyalty. Alternative Attractiveness refers to customer perceptions regarding the extent to which viable competing alternatives are available in the marketplace (Jones *et al.*, 2000).

For the KingStone on-line bookstore, the main competitor in Taiwan is BOOKS.com, the most powerful on-line bookstore. To customers of KingStone, when the costs of changing to other on-line bookstores are high, they should be loyal to it. But when considering alternative attractiveness, BOOKS.com is very attractive to them for it is the first brand of on-line bookstores. Because BOOKS.com may be very attractive to customers of KingStone, even though the switching costs are high, they may think BOOKS.com is another choice for them and think about changing from KingStone to BOOKS.com. On the contrary, even though KingStone is the main competitor for BOOKS.com, it is not as attractive to customers as BOOKS.com. That may explain why hypothesis eleven is supported in BOOKS.com sample, but not supported in the KingStone sample.

5.2 Managerial Implications

The results of this study have implications for managers of on-line bookstores like BOOKS.com and KingStone. Firstly, in order to retain customers and create positive perceptions of on-line bookstore services, the on-line bookstore operators are suggested to improve website service quality, RD logistics service quality, perceived value, and customer satisfaction collectively rather than improve only one variable. It is an incomplete strategy to consider only one variable and ignore the effects of the others.

Secondly, this study also supports the ideas that e-service quality, logistics service quality, sacrifice, and service value have indirect effects on customer loyalty of on-line bookstores. This finding highlights the importance of the intermediate role of service value and customer satisfaction in on-line bookstore service. Managers are recommended to consider both direct and indirect relationships because the indirect path may generate a great impact on desired consequences. Therefore, on-line bookstores should clarify the disparities between direct and indirect relationships before developing strategy.

Thirdly, managers of on-line bookstores need to be aware that the customer experience in the shopping or delivery process can have an effect on customer loyalty directly or indirectly. On-line bookstores managers should understand that the website is like the layout and dynamics of a brick-and-mortar bookstore. If a customer goes to a physical bookstore and discovers that books he wants is hard to find, products have wrong price, or information about books is insufficient, then the customer will be unsatisfied and will likely not return to the bookstore. Thus the e-service quality of on-line bookstores contains five concepts such as ease of use, privacy, design, information, and functionality. If customers think that an on-line bookstore's website is hard to use, is poorly designed, or posts inaccurate information, then they are likely to change to other on-line bookstores.

In addition, this study considers retailing delivery logistics service of on-line bookstores. When customers use retailing delivery service for on-line shopping, they will concern with user-friendly e-map mechanism, products received on time, the condition of delivery, and the manner of the staff of convenience stores. Thus the logistics service quality of retailing delivery service for on-line bookstores is composed of four concepts, including information quality, timeliness, order condition, and personnel contact quality. Managers need to be concerned with all details of how an order is delivered, and this means paying close attention to how, when, and where a package is delivered. Furthermore, how the staff of convenience stores treats customers when they picking up their orders is also an important part of retailing delivery services.

Additionally, the Importance-Performance attributes of e-service quality and logistics service quality for the BOOKS.com and the KingStone samples were also examined. The key results for BOOKS.com are that the website should focus on information (provide more information about books for customers) and functionality (fast loading of pages and offer more premium choices, like bonuses and e-coupons). And the retailing delivery provider should focus on order condition (receive undamaged books) and personnel contact quality (improve convenience store staffs' knowledge about delivery). BOOKS.com managers can use these findings to improve the website service quality and retailing delivery logistics service quality.

Besides, the key results for KingStone on-line bookstore are that the website should put focus on design (text and graphics should be clear and easy to understand) information (provide more information about books for customers) and functionality (fast loading of pages). And the retailing delivery provider should focus on timeliness (fast and reliable delivery of books) and personnel contact quality (improve convenience store staffs' knowledge about delivery). KingStone on-line

bookstore managers can use these findings to improve the website service quality and retailing delivery logistics service quality.

5.3 Research Limitations and Suggestions

Although the empirical findings are useful and may contribute to the existing literature by further validation, there are some limitations of this research that should be considered when interpreting its findings.

Firstly, this study was based on an on-line survey from a sample of on-line bookstore customers. However, the questionnaire items may be too more for respondents that may cause them to tire of responding. Besides, it is extremely difficult to know exactly what the characteristics of the population who have ordered books on-line and picked them up at convenience stores are. We cannot know whether the respondent is exactly the buyer who ordered books and picked up himself or just someone helping the buyer. Furthermore, the sample is somewhat skewed in favor of female, single, northerner, better-educated consumers. It is recommended for future sampling plan to gather similar sample size of each classification.

Secondly, this study separates the service quality of on-line bookstores into two parts, e-service quality and logistics service quality. Furthermore, the effect of switching costs to customer loyalty only considered with direct effect. It may cause the research model did not fit the data as well as expected. Since the research model of this study did not include all possible variables and all possible paths that affect consumer decision-making for services. For future studies, it is recommended to refine the decision-making variables and then develop a similar composite model to fit the data better.

Thirdly, this study did not discuss the on-line bookstores' after-sales service, including returning and exchanging books. It also did not mention service recovery when customers occurring service failures. It is an important part of on-line shopping services. Furthermore, this study did not discuss information flow and cash flow either. Thus, the future work is suggested covering these kinds of segments to increase the completeness of research regarding on-line bookstores services.

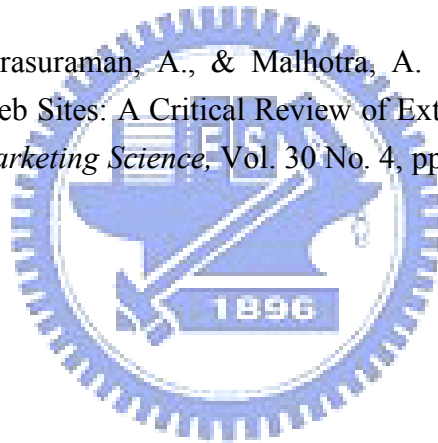
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APPENDIX

Dear Respondents :

Firstly, we appreciate your help in completing the questionnaire. This is a questionnaire about “ order books in on-line bookstores and pick-up at convenience stores”. The purpose of this questionnaire is to understand the relationships among website service quality, logistics service quality, and customer loyalty. This questionnaire is purely for academic research and no personal information will be made public. We deeply appreciate you taking time to complete the questionnaire.

Thank you!

Institute of Traffic & Yransportation,
National Chiao Tung University
Advisors: Dr. Cheng-Min Feng
Dr. Yu-Kai Huang
Researcher: Yi-Shan Yeh

Part One : The experiences of ordering books in on-line bookstores

1、 Which on-line bookstore would you visit the most frequently?

- KingStone BOOKS.com PChome ESLITE San-Min
CWBOOK.com SoIdea SILKBOOK.com Yuan-Liou Others

2、 Which on-line bookstore would you visit the second frequently?

- KingStone BOOKS.com PChome ESLITE San-Min
CWBOOK.com SoIdea SILKBOOK.com Yuan-Liou Others

3、 How long did you use on-line bookstores to order books and pick-up the orders at convenience stores?

- More than 5 years 3 - 5 years 2 - 3 years 1 - 2years
 0.5 - 1 year Less than six months

4、 how the average frequency did you order books in on-line bookstores one time?

- 1 week 1 – 2 weeks 2 – 4 weeks 1 – 2 months 2 - 3 months
3 – 6 months More than 6 months

5、How the average amount of money did you spend in on-line bookstore one time?

- Less than 250 dollars
 251 – 500 dollars
 501 – 1000 dollars
 1001 – 1500 dollars
 1501 – 2000 dollars
 2001 – 2500 dollars
 More than 2501 dollars

6、Which types of books did you order the most frequently?(choice multiple)

- Philology
 Finance and economics
 Life & Arts
 Comics & Graphic Novels
 Children’s Books
 Science & Humanism
 Education
 Mind & Health

7、Which type of packing would you prefer?

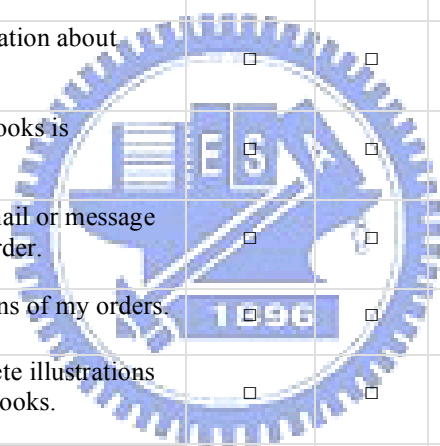
- Paper bag
 Plastic bag
 Others

Part Two : The website service quality of on-line bookstores

According to your experiences of ordering books in on-line bookstores, how the important level of these items?

	Very Important	Important	Common	Not Important	Not Very Important
1. I can find the books what I need by using search engine easily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. The site records all the books I have ever browsed, and it allows me to browse them again conveniently.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The hyperlinks make it convenient to browse the books that interest me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The shopping procedure is easy to understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. It enables me to complete a transaction quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. The site is simple to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. There are special measures for protecting information about my on-line transaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. My personal information will not be stolen or disclosed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Advertisements will not be mailed to me without my permission.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. The site has passed a security review and has the secure symbols.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. The site is attractively designed and is visually pleasing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. The display of objectives and graphics is appealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. The site can provide most of the covers of books, and it makes the pages look more orderly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The text and graphics are clear and easy to understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. The information about books is accurate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. The site provides information about new books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. The site provides information about best-selling books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. The information about books is sufficient.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. The site will send an e-mail or message to me to confirm my book order.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I can follow the conditions of my orders.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. The site provides complete illustrations for returning and changing books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. The site loads its pages quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. It provides the functions for interaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. It gives me numerous options of merchandise other than books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. It provides numerous premiums, like bonuses and e-coupon.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. It gives me numerous options for payment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. It gives me numerous options for delivery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



According to your experiences of ordering books in on-line bookstores, how the satisfied level of these items for the most and second frequently used on-line bookstores?

the most frequently used on-line bookstore						the second frequently used on-line bookstore				
Strongly Agree	Agree	Common	Disagree	Strongly Disagree		Strongly Agree	Agree	Common	Disagree	Strongly Disagree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. I can find the books what I need by using search engine easily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. The site records all the books I have ever browsed, and it allows me to browse them again conveniently.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. The hyperlinks make it convenient to browse the books that interest me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. The shopping procedure is easy to understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. It enables me to complete a transaction quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. The site is simple to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. There are special measures for protecting information about my on-line transaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. My personal information will not be stolen or disclosed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Advertisements will not be mailed to me without my permission.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. The site has passed a security review and has the secure symbols.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. The site is attractively designed and is visually pleasing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. The display of objectives and graphics is appealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. The site can provide most of the covers of books, and it makes the pages look more orderly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. The text and graphics are clear and easy to understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15. The information about books is accurate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. The site provides information about new books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17. The site provides information about best-selling books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18. The information about books is sufficient.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19. The site will send an e-mail or message to me to confirm my book order.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. I can follow the conditions of my orders.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21. The site provides complete illustrations for returning and changing books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22. The site loads its pages quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23. It provides the functions for interaction.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. It gives me numerous options of merchandise other than books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25. It provides numerous premiums, like bonuses and e-coupon.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26. It gives me numerous options for payment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. It gives me numerous options for delivery.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Three : The logistics service quality of retailing delivery provided by on-line bookstores.

According to your experiences of ordering books in on-line bookstores and picking up at convenience stores, how the important level of these items?

	Very Important	Important	Common	Not Important	Not Very Important
1. The e-map interface lets me choose a pick-up point conveniently.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. It gives me numerous options to choose the pick-up point.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The information of convenience stores on the e-map is accurate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. After my books arrived at the convenience store, it will send a message to remind me to pick up the books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. When I use an e-map, the information is processed quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Time between ordering books and receiving books is short.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Books arrive on the date promised.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. It reliably delivers my books to the convenience store I chose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. When I pick-up the books I ordered, the bar code information is accurate and can be read.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Damage rarely occurs during transportation of my books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. The books I received are undamaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. When I pick up, the convenience store staff can quickly find the books I ordered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. When I pick up, the convenience store staff have good manners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. The convenience store staff have good manners even though they are busy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. When there is a problem with delivery, the convenience store staff can immediately tell me what to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

According to your experiences of ordering books in on-line bookstores and picking up at convenience stores, how the satisfied level of these items for the most and second frequently used on-line bookstores?

the most frequently used on-line bookstore						the second frequently used on-line bookstore				
Strongly Agree	Agree	Common	Disagree	Strongly Disagree		Strongly Agree	Agree	Common	Disagree	Strongly Disagree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. The e-map interface lets me choose a pick-up point conveniently.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. It gives me numerous options to choose the pick-up point.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. The information of convenience stores on the e-map is accurate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. After my books arrived at the convenience store, it will send a message to remind me to pick up the books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. When I use an e-map, the information is processed quickly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Time between ordering books and receiving books is short.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Books arrive on the date promised.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. It reliably delivers my books to the convenience store I chose.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. When I pick-up the books I ordered, the bar code information is accurate and can be read.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Damage rarely occurs during transportation of my books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. The books I received are undamaged.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. When I pick up, the convenience store staff can quickly find the books I ordered.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. When I pick up, the convenience store staff have good manners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. The convenience store staff have good manners even though they are busy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15. When there is a problem with delivery, the convenience store staff can immediately tell me what to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Four : The perceived sacrifice and switching costs

Please mark the items aim for the on-line bookstore you most frequently chose.

	Strongly Agree	Agree	Common	Disagree	Strongly Disagree
I think the prices charged for ordering books from this on-line bookstore are reasonable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think ordering books in this on-line bookstore does not take much time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think ordering books in this on-line bookstore is easy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am used to choosing the same on-line bookstore to order books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel troublesome about some procedures for joining a new on-line bookstore to order books.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I choose another on-line bookstore, the pick-up place is not convenient for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If I choose another on-line bookstore, I will lose some premiums.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I choose another on-line bookstore, I need to spend some effort to know the service well.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part Four : The service value, customer satisfaction, and customer loyalty

Please mark the items aim for the on-line bookstores you most and second frequently chose.

the most frequently used on-line bookstore						the second frequently used on-line bookstore				
Strongly Agree	Agree	Common	Disagree	Strongly Disagree		Strongly Agree	Agree	Common	Disagree	Strongly Disagree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I think that the service provided by this on-line bookstore compared to the price I had to pay is acceptable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I think that it is more worthwhile to use this on-line bookstore than others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Compared to the price, I think the service provided by this on-line bookstore is very valuable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In general, the service from this on-line bookstore conformed to my expectations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In general, I am satisfied with the service that this on-line bookstore provided.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Shopping on this on-line bookstore is a wise decision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I will recommend this on-line bookstore to my friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If I want to buy books, I will choose this on-line bookstore first.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I am willing to do other business in this on-line bookstore.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Compare to other on-line bookstores, I prefer this on-line bookstore.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Personal Information

■ Gender

- Male Female

■ Age

- Less than 15 years old 16 - 18 years old 19 – 22 years old
 23 – 29 years old 30 – 40 years old 41 – 50 years old
 More than 51 years old

■ Marital Status

- Single Married (have kids) Married (no kids) Others

■ Education

- Junior high school or less Senior high school College/University
 Graduate school or more

■ Occupation

- Student Housekeeping Soldier Government Employee Teacher
 Professional Freelancer Employee of Company Manufacturing
 Information Technologist Retailing Others

■ Income (N.T dollars per month)

- Less than 5000 dollars 5001 - 10000 dollars 10001 - 20000 dollars
 20002 - 30000 dollars More than 30001 dollars

■ Area

- Northern Taiwan Central Taiwan Southern Taiwan Eastern Taiwan
 Offshore Taiwan Others

