Sustainable Online Shopping Logistics for Customer Satisfaction and Repeat Purchasing Behavior: Evidence from China

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Abstract: This study examines the impact of the quality of online shopping logistics services on customer satisfaction and in driving subsequent repeat purchasing behavior. Five hypotheses are established to represent the relationships between customer satisfaction and each factor of logistics services: quality of information, quality of order, quality of delivery, price of delivery, and customer service. The research includes surveys conducted over two months from 1 December, 2016, to 31 January, 2017, targeting mostly young Chinese customers with experience purchasing products online, thus representing e-commerce. A questionnaire was distributed to each subject in a sample of 150 Chinese customers with online shopping experience. The empirical analysis indicates that logistics service quality, and primarily the quality of delivery, has a statistically significant impact on customer satisfaction, which, in turn, has a statistically significant impact on repeat purchasing behavior. The results provide insight into the strategy behind China's rapidly growing online shopping industry, which focuses on maintaining stability through long-term customer relationship management.

Keywords: online shopping mall; logistics service; purchase intention; customer satisfaction

1. Introduction

Sustainability is becoming an increasingly important consideration in various aspects of business. With regard to logistics, recent studies show that much can be done to protect the planet by considering the efficient use of resources [1–4]. E-commerce and logistics are inseparable. Purchases made online must be shipped via the road, rail, waterway, or air. In addition to the logistics industry, online stores and home shopping channels increase traffic and affect customer convenience and reliability (and price). Customers can choose an environmentally friendly mode of delivery of goods. Shopping is already related to logistics challenges and storage, and, although all the factors that play a role cannot be listed, online retailers are certainly aware that logistics and sustainability are scientific. However, the significance of e-commerce lies in the sensitivity of stakeholders to responsibilities that go beyond the product and the company. Sustainable logistics is related to CO_2 savings. However, it also extends naturally to social and societal concerns.

Sustainability has also been gaining prominence in academic research on the supply chains owing to the extended supply chains in modern business operations. This field is one of many areas that have recently attracted attention from both scholars and practitioners. The development of the sustainable supply chain in practice has motivated scholars' investigations. Yang et al. [5] examined the main perspectives found in research on sustainable retailing in the fashion industry. They found

that the most prominent topics in the field are sustainable retailing in disposable fashion, fast fashion, slow fashion, green branding, and eco-labeling; retailing of secondhand fashion; reverse logistics in fashion retailing; and emerging retailing opportunities in e-commerce. This finding implies that research on sustainable retailing in the fashion industry in developing markets is lacking. Oláh et al. [6] argued that everyone clearly wins by applying sustainability to e-commerce. They claimed that these wins can be achieved by improving and safeguarding the quality of life by protecting the environment, preserving natural resources, and maintaining and sustaining the economy. They also concluded that a sustainable e-commerce environment leads to greater benefits, not only in terms of online business sustainability, but also in terms of policy-making and environmental protection, as companies create economic value and avoid labor unrest. Focusing on cross-border e-commerce in China, Su et al. [7] analyzed the internal structure and dynamic layout characteristics of sustainable cross-border e-commerce policy documents. Based on their analysis, they argued that governments should focus on supervising payments, transactions, and goods in the early stages of development, and should begin comprehensively supervising all aspects of the cross-border e-commerce supply chain to create a sustainable cross-border e-commerce environment.

Specifically, consumer activism is increasing, and the demand for fast and immediate delivery is growing. Sustainable logistics solutions, such as recycling and reusing delivery packaging, are affordable mechanisms for online businesses to ensure ecofriendly, same-day deliveries that satisfy their customers. Two revolutions in consumer behavior are happening simultaneously. Amazon Logistics has ensured that customers are accustomed to receiving goods within hours of placing an order. In response, businesses seeking to maintain their market share are rushing to develop on-demand delivery options. Although consumers demand that goods be delivered with imperative immediacy, they also seek to influence what brands sell. Consumer activism is increasing, and customers are currently more likely to purchase based on brand beliefs than they were three years ago.

In a recent study on sustainable logistics and e-commerce in Asian markets, Choi and Mai [8] investigated whether the characteristics of e-service quality positively influenced customer loyalty as one of the sustainable success factors in this growing e-commerce industry, especially in the Vietnamese market. They argued that it is crucial to promote e-trust as a vital element for the sustainable growth of the e-commerce industry. Focusing on the Taiwanese market, Moslehpour et al. [9] proposed a model that partially combines personality traits and technology acceptance model attributes to study the influences of personality characteristics and perceptions of technology on e-purchase intentions. They found that consciousness significantly influences perceived usefulness, perceived ease of use, and openness to experience. In particular, perceived ease of use had the strongest positive impact on sustainable e-purchase intentions. As in our study, Akram et al. [10] examined the Chinese market and studied the impacts of situational variables, scarcity and serendipity, on online impulse buying in the Chinese social commerce environment. The results confirmed that these situational factors positively influence online impulse buying among Chinese online shoppers in this environment. Given the growing significance of sustainable logistics, this study investigates the impact of the quality of logistics services related to online shopping on customer satisfaction and in driving subsequent repeat purchasing behavior in China.

1.1. Research Background and Objectives

The first e-commerce site was launched in China in 1998. Thereafter, online shopping malls experienced rapid growth, both quantitively and qualitatively. The business-to-consumer (B2C) online shopping mall "8848" launched the first Chinese website, marking the beginning of online shopping in the country. The development process of online shopping in China can be divided into three stages.

During the first stage, the number of Chinese Internet users was comparatively small relative to today. According to statistics issued in 2000 by China, there were only ten million Internet users. At the time, 8848 was the benchmark for online shopping malls. During this period, most Internet users primarily used e-mail, and Internet use was generally limited to reading the news. The online shopping

market was fledgling during this initial phase, and Internet users were unfamiliar with the concept of shopping using the Internet. This early stage of infrastructure development provided a few online shopping malls, and the industry struggled to grow through the conditions of early development.

Several shopping malls dominated online shopping in China. For example, Taobao (淘宝), Tianmao (天猫), DangDang (当当), and ZhuoYue (卓越) were established during this initial period. With an increase in the digital presence of S&P (Standard and Poor's) companies and online gaming businesses, the Chinese online communications market was transformed. During this phase, general changes were made to the Chinese e-commerce environment as Internet users began to perceive online purchasing as the next trend in shopping and their numbers increased.

Additionally, businesses began using business-to-business e-commerce to solicit orders and for networking opportunities in China, and the concept of "Internet vendors" was born. With these changes, the online shopping industry in China grew rapidly, thereby accumulating many capital gains.

From late 2009, traditional commerce entered the online environment in earnest, and, with the smooth inflow of capital, the e-commerce environment matured, and online shopping was popularized. In 2010, online shopping constituted 23% of all Internet usage, and the rapid development of the Chinese e-commerce market consequently fostered new enterprise. With the steady growth of the Chinese economy and the expansion of Internet usage, it is expected that this high rate of growth will continue.

Internet coverage has expanded. The number of Internet users exceeded 850 million in 2017, and users accessing the Internet on mobile devices exceeded 750 million. This increase in the proliferation of e-commerce has shown a growth rate two to three times faster than that of real GDP. By 2017, the value of e-commerce transactions exceeded CNY 2.5 billion, which is 1.5 times larger than it was in 2015.

Along with the development, evolution, and proliferation of the Internet, information and communications technology (ICT) is developing rapidly. Unprecedented numbers of transactions are taking place via e-commerce.

Businesses can use the Internet to transcend traditional marketplaces, opening them up to the world. However, the rapidly evolving environment provides new opportunities for business, and understanding online customer behavior is essential to remaining competitive and responsive to market fluctuations.

The unique services of online shopping, and particularly logistics services, should be a differentiating factor that enhances customer satisfaction and, consequently, drives repeat purchases.

Previously, customers transacted by visiting brick-and-mortar department stores, specialty stores, supermarkets, and so forth. The advent of new distribution channels has increased purchase opportunities, and the number of online shoppers is gradually increasing. Online shopping is facilitated by quick searches for information and the remote purchasing of products that are more expensive in offline stores. With the availability of products and services unrestricted by time and space, the online shopping market maintains continuous growth.

However, from a marketing perspective, many aspects of a brick-and-mortar shopping mall are difficult to translate into a recognizable online presence. Differentiating between the quality of services offered by various online shopping malls becomes a challenge, especially given the rapid growth of the online market. Compared to traditional shopping malls, online malls are limited in their understanding of customers' purchasing behaviors and in determining the perception of their online service. Furthermore, additional problems are arising, including data leaks, the stability of electronic payments, and the safety and security of deliveries.

The Internet has enabled online malls to reinforce their representative global distribution, but the fastest growing online shopping market remains that of China. According to statistics released by China's 艾瑞咨询, the number of Chinese Internet users reached 668 million in 2016, making it the largest Internet-using country in the world. Included in this figure are 350 million people (48.9% of the

total) who purchase online. Trade through online shopping reached RMB 18.5 billion, and the growth rate of e-commerce is faster than that of traditional distribution channels.

The number of online shopping malls entering the Chinese market is increasing annually. Conventional Chinese businesses are transforming their distribution models from offline trading to online shopping mall markets. It is therefore imperative for businesses to ascertain the aspects of online shopping that their customers find appealing and the relationships between their customers' interests, their satisfaction levels, and their repeat purchasing behaviors.

In summary, businesses need to develop their ability to maintain steady customer relations in line with the rising expectations for quality in online shopping logistics. The cases of customer dissatisfaction resulting from damage related to online purchasing are increasing. Therefore, online malls need to continually improve their logistics services to retain customers.

Although e-commerce studies are actively being conducted in foreign countries, a few studies on online shopping in China exist. This increases the risk of failure for foreign businesses in China, owing to the country's dissimilar business environment and varying cultural characteristics. E-commerce research conducted in China has been limited to that on account payments, Internet safety, and credit queries. Thus, the need for research on the logistics service quality of online shopping in China is increasing. This study analyzes the influence of logistics services on Chinese customers' satisfaction levels and their repurchase intentions.

1.2. Research Methodologies and Contents

The objective of this study is to measure the impact of logistics services on customer satisfaction and repurchase intentions in China. Accordingly, it combines both reference and empirical research. First, based on the literature, this study theoretically examines online shopping, its development, logistics service quality, customer satisfaction, and intention to repurchase in China. Through a subsequent analysis, online shopping mall services are categorized based on logistics quality factors. These include the quality of information, quality of order, quality of delivery, quality of customer service, and price of delivery, which constitute the variables under study. The literature guides the establishment of the models for the hypotheses used in this empirical research.

This study posits five hypotheses representing the relationships between customer satisfaction and each logistics service factor: quality of information, quality of order, quality of delivery, price of delivery, and customer service. This study puts forth one additional hypothesis on the effects of these factors on repurchase intention, bringing the total number of hypotheses to six.

The collated data underwent an empirical analysis using SPSS 18.0. To test the reliability of specific data, reliability analyses were performed. To test the hypotheses, a correlation analysis and a regression analysis were performed.

This paper is divided into five sections. Section 1, the introduction, describes the objectives of this research, the methodologies used, and the contents of the paper. Section 2 examines theories supporting this study, the online shopping malls used in the research, the status of online shopping in China, the quality of logistics services, and previous literature on logistics service quality. It also organizes the concepts of customer satisfaction and repeat purchasing behavior based on the existing literature. Section 3 presents the models and research hypotheses. Section 4 discusses the empirical analysis of the hypotheses based on the collated questionnaires. Section 5 summarizes the research results and concludes the paper.

1.3. Research Limitations

The limitations of this research are as follows. First, the Internet service infrastructure differs between regions, and the quantity of large-scale logistics businesses is insufficient to represent all of China. Additionally, the specific services provided by each logistics company vary. It is possible that the influences of some factors on logistics service quality are not identified in this research.

Second, the research on customer satisfaction and the logistics services of online shopping malls in China is lacking. Therefore, this research proceeds without sufficient verification of the validity of the literature. Thus, a theoretical and systematic model for integration and analysis should be developed.

Third, this research limited the study subjects to young people living in China, which might yield interpretive errors. Furthermore, owing to the limited geographical range and number of respondents, the sample may not be statistically representative of the population.

Fourth, the respondents to the questionnaire answered from their personal perspectives. Thus, subjective opinions on online shopping may influence the responses to certain questions. Future research should include survey methods (e.g., in-depth interviews) that closely monitor the real-time intentions and actions of respondents, which would help to validate the results.

2. Theoretical Background

2.1. Online Shopping

2.1.1. Online Shopping Malls

Online shopping malls differ from offline shopping malls in that they are electronic retail markets that provide e-commerce to individual customers and businesses. Online shopping is also called virtual shopping or electronic shopping. Online shopping malls can be referred to as online retail shops, virtual shops, online storefronts, or online shopping malls. This paper uses the term "online shopping malls" to define the e-commerce environment.

Physical space is not a consideration for online shopping malls. Wherever there is Internet connectivity, customers can communicate with other shoppers and purchase through market transactions, which are managed by information systems. In other words, online shopping is the process of acquiring information, services, and products via Internet purchases. B2C transactions are the most representative form of e-commerce. Online shopping malls use websites to facilitate direct product ordering, account settlement, and direct-to-consumer delivery.

E-commerce enables the sale of products to Internet users around the world. Customers can compare the product price and quality and can purchase products at a reduced rate, owing to the lack of costs inherent in the traditional distribution chain of brick-and-mortar stores. For business owners, the operational costs of online shopping malls are lower, and there is no limit to operational hours, geography, or physical space. The reduced operational costs mean that products can be sold at lower prices, owing to factors such as the elimination of rental fees. However, the volume of information available on the Internet means that customers can find it difficult to locate their exact product of choice. Additionally, the challenges faced by online shopping malls are compounded by inefficient processes related to after-sales service and repeat purchases.

Hoffman and Novak [11] defined online shopping malls as "the gatherings of online stores with diverse products." Online shopping malls manage their own online marketing and use the Internet to store information on business websites, including product prices and features.

Business websites can use multimedia to accompany the companies' product specifications. Jarvenpaa et al. [12] defined online shopping malls as information systems that facilitate communication between market participants and that assist the conduct of trade via a communications network between mutually convenient geographies. It is a virtual environment in which the products and services are bought and sold, and it is changing traditional market structures, the developments in lifestyle, and the evolution of broader social structures. E-commerce directly impacts the distribution, finance, and service industries.

Shankar et al. [13] defined several differentiating factors between online shopping malls and traditional, brick-and-mortar shopping malls, including the construction of Internet websites that provide information and prices on products. It is a virtual store that allows customers to browse through the contents, pay accounts, and arrange product delivery. In addition, Hennig-Thurau et al. [14] defined

online shopping as a form of e-commerce involving B2C transactions that are managed by information systems and communication networks.

2.1.2. Online Shopping Mall Categories

Online shopping malls can be categorized according to their purpose, as they can function as either comprehensive shopping malls or as specialized shopping malls, depending on the types of products and services they represent. Leanne et al. [15] categorized them further into comprehensive (multiple type) and specialized shopping malls (single type), according to the range of product categories they represent.

Comprehensive shopping malls (multiple type) is a term for online shopping malls that market products from a variety of online retailers, such as department stores and mass-market stores. The products from various stores are listed together, displayed on the shopping mall's website, and accessed via a single drop-down menu. The concept behind comprehensive online shopping malls is to mirror the scope, availability, and variety of products that might be found in traditional, brick-and-mortar shopping malls. According to Gome et al. [16], the success of comprehensive shopping malls with broad target markets depends on each of the customer's brand awareness. However, revenue can be made sustainable by satisfying a multitude of customer demands. To secure the online capacity to facilitate multiple transactions, a comprehensive online shopping mall must secure its reputation and build a loyal customer base. As a result, comprehensive online shopping malls require a relatively high initial investment fee.

In China, www.taobao.com, www.tmall.com, www.jingdong.com, www.dangdang.com, and www.yhd.com are examples of comprehensive online shopping malls.

Jang [17] defined specialized shopping malls (single type) as online shopping malls that tend to offer specialized products which are more than a large range of products and that provide specialized information accordingly. These malls offer categories of products such as clothing, cosmetics, computers, fancy goods, and books. They also provide in-depth information on products and offer price advantages compared with comprehensive shopping malls. Accordingly, the most important success factors for specialized online shopping malls are their degree of specialty and their affiliations with specialized partner companies that supply professional products. In general, the term "specialized online shopping malls" refers to shopping malls that sell products in commercial categories, such as clothing, fancy goods, cosmetics, books, albums, computers, and related components. Notably, although specialized shopping malls may lack delivery accuracy, reliability, safety and speed, they are increasing in number because they satisfy specialized tastes. The representative specialized shopping malls in China include www.bj.jumei.com, www.lefeng.com, www.suning.com, and www.yougo.com.

2.1.3. Online Shopping Mall Characteristics

Technically, online shopping malls are the realm of electronic commerce. However, they also provide channels for digital marketing. Although online shopping malls are used either for e-commerce or for digital marketing, the two purposes are similar because they both signify transactions via computers connected to the Internet.

Compared with offline shopping malls, online malls possess four significant advantages. First, customers save time by avoiding having to visit a brick-and-mortar store. Access to a computer and an Internet connection means that products can be bought without time or space constraints. Second, products can be searched for and found with ease. Wei [18] found that online shopping increases the possibility of acquiring products that were previously difficult to attain because it facilitates transactions for both foreign and domestic products. Using only a few product keywords and with the optional selection of categories and subcategories, customers can easily search for and find their products of choice. Third, products are, in general, cheaper when purchased online. Virtual stores save on the operational costs of brick-and-mortar stores because they pay lower worker wages and rental costs. Thus, their prices can be discounted relative to those of offline stores. Fourth, customers can search for

various products for comparison purposes. Price comparison sites condense product information to compare the offerings of different shopping malls, making online shopping a quick and convenient way to purchase.

As a result of these relative advantages, the number of online shopping malls is increasing, and online shopping is becoming a significant factor in driving the overall Internet use.

However, online shopping also has disadvantages. These include problems related to information security, the logistics of exchanges and refunds, and the complications involved in delivering products from multiple sources to a single customer. Niranjanamurthy et al. [19] stated that shopping search engines and comparison websites help customers find cheaper prices. Although this satisfies certain customers, retailers find it restrictive because of the filtering of the customer's consideration set. Some customers prefer the tactile and sensory experience of products when deciding on a purchase, which cannot be provided by e-commerce. Additionally, customers and businesses both need to be wary of credit card fraud. Some have predicted that fraud will lead to the demise of online business. Customers run risks, such as identity fraud, because their personal details are captured by e-commerce websites. Businesses run the risk of phishing attacks and other forms of security fraud. Thus, online shopping is significantly affecting individual customers and businesses.

2.2. Online Shopping Development Processes and Status in China

2.2.1. The Chinese Online Shopping Industry

The number of Internet users in China is growing, and most people are now familiar with the Internet. Each year, the advantages of the Internet are driving customers to consider online shopping. According to Anderson and Srinivasan [20], the early stages of the Internet revealed problems with the security of private information as well as general reservations about online shopping. These have since been resolved, and the upward trajectory of online shopping continues.

The statistical data issued by 中國互聯網信息中心 (China Internet Network Information Center; CNNIC) show that the number of Chinese Internet users in December 2015 reached 688 million. This represented 56,260,000 new Internet users compared with December 2014. Internet coverage reached 50.3%, with an increase of 2.4% over the same period.

In 2015, the sum of e-commerce transactions in China was CNY 3.2 trillion (approximately USD 439 billion), indicating an annual increase of 23.3%. Subsequently, the sales revenues generated by online shopping in 2014 totaled CNY 2.45 trillion (approximately USD 357 billion), indicating an annual increase of 32.4%. In 2016, online shopping transactions totaled CNY 3.6 trillion (approximately USD 524 billion), indicating an annual increase of 19.2%.

According to data issued in December 2016 by iResearch (Ire Consulting), B2C transactions are becoming a benchmark of rapid growth through the increase in online purchasing. An examination of the internal structures of online shopping malls reveals that the proportion of B2C transactions is gradually increasing, making these transactions the future driving force behind online shopping in China.

2.2.2. Online Shopping in China

On 10 May, 2003, Taobao 淘宝网 (www.taobao.com), an online retail distribution company, was established by the Alibaba Group. Taobao is the largest online shopping mall in Asia, but the first appearance of www.taobao.com in China did not alter much for consumers.

Today, one-third of purchase transactions in China's domestic retail industry take place online, with the remainder served by brick-and-mortar department stores and discount stores.

According to their published statistics, taobao.com had 550 million members in 2015. Every day, 60 million customers visit the site, and nearly 800 million new products are registered. On average, 50 thousand new products and services are bought per minute from taobao.com.

The payment system introduced and managed by Alibaba is a third-party transactional platform called Alipay (支付宝). First, the buyer sends the payment funds to Alipay. Then, once product delivery has been confirmed, Alipay pays their suppliers. This process guarantees the security of transactions [21]. Man [22] stated that almost 47 million people are registered with Alipay and that Alipay processes approximately 800,000 online purchases every day, amounting to USD 21 million. Another feature of Taobao is that it offers free delivery. As the online shopping industry in China is still emerging, Taobao offers free delivery to encourage purchases via its online platform. Free delivery relieves the burden of additional costs to the product purchase price, driving Taobao brand awareness and market dominance.

Owing to its popularity and reputation, many companies opt to sell their products through Taobao rather than establishing an individual web presence. Taobao offers its customers a degree of confidence in the reliability of the products sold via its platform, and this confidence serves to break down the barriers to product trials experienced by new product entrants to the traditional market.

2.3. Quality of Logistics Service

Previous Studies on Logistics Service Quality

A previous study [23] established the main factors that determine the quality of a logistics service related to online shopping: quality of the order, quality of delivery, customer service, and the delivery price. McDougall and Levesque [24] examined the quality of the logistics service provided by CATV Home Shopping, confirming that the quality of employees, the accuracy of the delivery service, the punctuality of delivery, customer service, and the condition of the delivered product statistically significantly impact customer satisfaction.

Park [25] performed an empirical analysis on the correlation between information quality and logistics quality and connected each logistics service quality factor to customer satisfaction. Additionally, the study examined the impact of customer satisfaction with the logistics service on customer loyalty.

Lee et al. [26] concluded that logistics service quality is primarily influenced by the speed of delivery, accuracy of the delivery system, safety of delivery, ease of delivery, and personability of the delivery person. By examining the logistics service factors of an online clothing shop, the study found that the degree of customer satisfaction is influenced by the speed of delivery, safety of delivery, and personability of the deliveryman.

Ho [27] examined the effects of online communication on the quality of logistics services and the effects of product quality and logistics services on customer satisfaction and the credibility of online shopping malls.

Yoon [28] concluded that the quality of the order, the quality of delivery, customer service, and the delivery price are factors that affect the overall quality of a logistics service. The study examines the impact each of these factors has on logistics service quality, as well as the relationship between the perceived value of logistics and customer satisfaction and loyalty.

Based on this theoretical background, scholars in this field commonly propose that the factors impacting logistics service quality are as follows: order cycle, product availability, order size limitations, convenience of the ordering process, order detail, the condition of the delivered product, and the return policy. The eight-stage model of Liang and Huang [29] has been reorganized, and the previous stages of order, payment, delivery, and after-sale service are modified to order quality, delivery quality, and customer service. Thus, this study establishes the determinants of logistics service quality by adding information quality and delivery price to the factors previously identified by academic research.

2.4. Customer Satisfaction and Repeat Purchasing

2.4.1. Customer Satisfaction

Customer satisfaction is one of the most widely studied concepts in the field of consumer behavior. Many studies use consumer satisfaction as a parameter and a result variable.

Customer satisfaction refers to the marketing technique that focuses on the satisfaction that customers experience when they purchase a product or a service [30]. It involves the quality and performance of the purchased product as well as the service and after-sales service provided by the shop assistant.

Customer satisfaction is a customer's degree of actual satisfaction after purchasing relative to the anticipated satisfaction. The greater the customer satisfaction, the greater the likelihood of repeat purchasing behavior. In the United States, companies use this parameter to quantify the degree of customer satisfaction and compare products. In summary, customer satisfaction is the degree to which a product or a service satisfies the expectations and demands of its consumer. It is a condition governing customer loyalty and repeat purchasing. The definition of customer satisfaction can vary according to different perspectives on the topic.

Hun [31] stated that customer satisfaction refers to "how customers feel favorable or unfavorable sentiments during the process of buying, comparing, selecting, and evaluating a product or a service."

Srivastava [32] explained that customer satisfaction is the customers' conscious evaluation and judgment, after using a product or a service, of whether the quality was appropriate or whether it fit the purpose of use.

Koivumaki [33] stated that customer satisfaction has a significant relationship with an online shopping mall and the trust customers feel toward the mall and that this trust is a factor connecting customer satisfaction to customer loyalty.

Wu and Huang [34] explained that customer satisfaction with an online shopping mall correlates with the satisfaction that customers experience through service quality.

Jung [35] defined customer satisfaction as the feeling that customers experience after a positive transaction. In terms of online shopping, customer satisfaction is the comprehensive evaluation of the customers' purchasing experiences from an online shopping mall.

Rather than defining customer satisfaction as the gratification of customers through several transactions over a period, Hyeon and Hyun [36] defined customer satisfaction as the result of cumulative transactions. In other words, customer satisfaction is defined as the cumulative conclusions of the evaluation of multiple individual transactions.

Lee and Joshi [37] defined customer satisfaction as surpassing a customer's expectations of a transaction. Service quality is perceived, whereas satisfaction is an experience that is determined by the emotional processes involved throughout the transaction. Thus, customer satisfaction with a purchase transaction is related to the quality of the purchased item as well as to customer sentiments concerning the transaction process. Consumers therefore may or may not be satisfied regardless of the quality of the product/s in question.

Ho [38] used the characteristics of online shopping to conclude that reliability, tangibility, responsiveness, differentiability, and security are the factors that determine logistics service quality. The author argues that these quality factors positively influence customer satisfaction and repurchase intentions.

Liu et al. [39] empirically proved that the factors in logistics service quality exert significant influence on customer satisfaction and that they have a statistically significant impact on repeat purchasing behavior and customer recommendations.

This study defines customer satisfaction as the evaluation by customers based on their online shopping experience of purchasing a product or a service. The research posits that customer satisfaction is an important influencing factor in a customer's intention to repurchase and examines customer satisfaction as an important determinant of repeat purchasing behavior.

2.4.2. Intention to Repurchase

The intention to repurchase generally refers to the "willingness of customers to rebuy certain products, services, or information in the future," which is affected by a customer's satisfaction or dissatisfaction. The intention to repurchase signifies the possibility of the repurchase of a certain product or service or a higher likelihood of spontaneous purchase by other customers. Maintaining original customers is economical compared with securing new customers, and the intention to repurchase signifies a higher likelihood of repeat purchasing. Thus, businesses must consider building foundations for long-term consumer demand [40].

Satisfied customers tend to continuously buy the same product and are less sensitive to the price incentives of rival companies. Word of mouth also plays a pivotal role in increasing profits. The intention to repurchase determines the likelihood of future repeat use of the same product, customer satisfaction, repeat purchasing behavior, and customer retention, and these factors directly correlate with one another.

Dlacic et al. [41] stated that a customer's intention to repurchase after purchasing a product or service can be affected by the experience of dissatisfaction or discontentment through the transaction.

Customer discontentment brings about behaviors that, through word of mouth, influence other potential customers who are considering buying the same product or service.

Srivastava and Sharma [42] stated that the intention to repurchase is determined by whether customer reviews concerning a product or service in an online shopping mall are positive or negative. They predicted that if customer evaluations of a product or service are positive, the intention to repurchase will increase, and if they are negative, the repurchase intention will decrease.

3. Research Model and Research Hypotheses

3.1. Research Model

This research analyzes the relationship between the quality of Chinese online shopping malls' logistics services and customer satisfaction. Customer satisfaction can be measured by applying the findings of previous studies to online shopping and by establishing the determinants of logistics service quality.

The model shown in Figure 1 is used to examine the influence of the quality factors for online shopping malls' logistics services on customer satisfaction and repeat purchasing behavior.
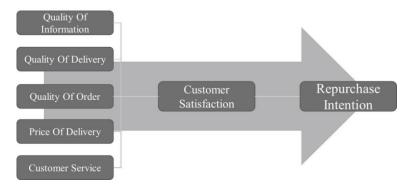

Figure 1. Research model.

3.2. Research Hypotheses

Online shopping logistics services are valid from order placement to final product delivery. Additionally, the factors that influence service at the order stage can affect service at the time of delivery and, ultimately, impact customer satisfaction.

Mentzer et al. [43] proposed nine factors that influence logistics service quality: quality of employees, quality of information, process of ordering, omission of order, conditions of order, accuracy

of order, quality of order, punctuality, and management of order inconsistency. Zhang et al. [44] suggested that the four factors that affect logistics services are quality of order, quality of delivery, delivery price, and customer service. Cho [45] proposed the convenience of ordering, quality of service agents, offering of delivery information, and punctuality of delivery as key factors. This study posits that the quality of information and punctuality as the determinants of logistics service quality, following Mentzer et al. [43], and it includes the quality of order and quality of delivery, following Zhang et al. [44] and Cho [45].

Moon and Jung [46] examined the aspects of service quality for online shopping malls (i.e., product, price advantage, quality of order, quality of delivery, ease of interface, shopping-related information, and after-sale service) on customer satisfaction and intention to repurchase and the effects of these aspects on customers' dissatisfaction behaviors.

This research proposes hypotheses based on the research model shown in Figure 1 to empirically analyze the influence of logistics service quality factors on customer satisfaction, and, consequently, the influence of customer satisfaction on the intention to repurchase.

The quality of the information of an online shopping mall refers to the ease and accessibility of the product search and location. Additionally, reliable information on product specifications, visual images, and accompanying product descriptions must be present to facilitate customer purchase decisions. By shopping offline, users might obtain product and delivery information through a store assistant. However, without such store assistants online, the quality of information significantly influences customer satisfaction.

The quality of order refers to whether customer expectations and demands before purchase are consistent with the final product upon delivery. The quality of order can increase or decrease customer satisfaction depending on the fulfillment of certain demands and expectations, such as the operation of a purchased product, whether it matches the intended use, or if the customer's expectations are met.

E-commerce offers convenience and inexpensive delivery. However, although customers may assume that the delivery fees are included in the invoice price, additional fees for shipping may be required after purchase. In this case, the final purchase price online can match or be higher than the offline price. Additionally, the price of delivery can vary between locations and conditions.

Customer service entails the after-sales support or other logistics services performed on behalf of the customer upon completion of a transaction. Owing to problems, such as incorrect product specifications, customers may request a refund or to return goods. However, most online shopping malls do not provide an after-sales service. This study defines customer service as a reflection of returns, refunds, and customer opinions. As the literature confirmed, customers avoid online shopping because of its reputation for poor after-sales service. Accordingly, this study posits customer service as an important factor influencing customer satisfaction.

Customer satisfaction refers to the customers' response according to their level of gratification. It is the consumers' judgment of whether the features or consumption of a product or service have led to pleasurable satiation. This study establishes a model that examines the influence of service quality and customer satisfaction on the intention to repurchase.

The research employed to verify the hypotheses finds that customer satisfaction statistically and significantly impacts intentions to repurchase.

3.3. Definition of Variable Manipulation and Measurement

Before setting forth the objectives of this research, it is necessary to establish definitions for the manipulation and measurement of the influences of the variables. To verify the model used, each selected variable should have a conceptual definition as well as a measurable definition for its manipulation. Specific definitions for the manipulation of each variable are presented in Table 1.

Table 1. Educational attainment in Hanoi and HCMC (Ho Chi Minh City), total and by gender (in %).

Research Variable	Component	Definition
Service Quality	Information Quality	The information provided by the internet shopping extent that customers may recognize and reliable
	Order Procedure	The order process is clear, easy to use
	Accuracy	Orders until the appointment extent to which the product is delivered to customer
	Order Accuracy	The degree to which the customers's orderd product arrives
	Order Quality	The extent to which the customer has ordered products match the machine or purchase order detail
	Customer Service	After purchasing goods over the internet to consumers in the online shopping mall is about A/S support and other after sales serivces
	Logistic Service Quality	Logistics services relating to all the problems in the process of shipping goods
	Delivery Cost	Among commodity prices consumers actually feel associated with shipping logistics service cost
Customer Satisfaction		Overall satiafaction with the goods or services provided by the internet shopping mall
Repurchase Intention		Consumers are likley to continue to use and repeat in the current service provider future behavior and customer loyalty

4. Hypothesis Testing and Analysis Results

4.1. Analysis of Observation Data

This study conducted surveys over two months, from 1 December, 2016 to 31 January, 2017 primarily among young Chinese customers with experience purchasing products online as representatives of electronic commerce. The survey questionnaires are presented in Supplementary Materials. Additionally, the sample firms were selected from a list of logistics companies registered with the Ministry of Communications of China and the membership list of the China International Freight Forwarders Association. Using these data, this study analyzed the effects of customer satisfaction with a logistics service on customers' intentions to repurchase in the online shopping environment.

As stated, this study establishes quality of information, quality of order, quality of delivery, price of delivery, and customer service as the independent variables affecting logistics service quality.

In all, 116 of 150 survey questionnaires were returned. The questionnaires with insufficient responses or those deemed invalid were removed, and 103 survey questionnaires were used in the final analysis. The response rate was 68.7%.

Examining the demographic characteristics of the samples used in this research, 56 men (54.37%) and 47 women (45.63%) responded to the questionnaire.

The age distribution of respondents was one person aged below 19 years (0.97%), 71 people aged between 20 and 29 years (68.93%, the largest portion), and 31 people aged between 30 and 39 years (30.1%).

The distribution of education level was 13 people with a high school diploma (12.62%), 16 people currently attending college (15.53%), 70 people with a bachelor's degree (67.96%), and four people with a post-graduate degree.

Examining the occupations of respondents, 14 people were students (13.59%), and the largest group was office worker, with 70 people. Examining the frequency of online purchasing, 23 people bought once or twice per month (22.33%), 34 people bought three times monthly (33.01%), and those with more than three purchases per month total 44 people (42.72%). Table 2 shows the statistical characteristics of the respondents.

<div align="center">Table 2. General features of the sample.</div>

	Category	Fq	Ratio		Category	Fq	Ratio
Sex	Male	56	54.73		Below 19	1	0.97
	Female	47	45.63	Age	20–29	71	68.93
Job	Student	14	13.59		30–39	31	30.10
	Worker	70	67.96		Above 40	0	0
	Housewife	5	4.85	Education	High School	13	12.62
	Self-employed	9	8.74		Attending University	16	15.53
	Others	5	4.85		University Graduate	70	67.96
Wage (Yuan)	Below 2000	21	20.39		Above Graduate	4	3.88
	2001–4000	34	33.01	Frequency of purchase (Month)	0	2	1.94
	4001–6000	27	26.21		1–2	23	22.33
	6001–8000	19	18.45		3	34	33.01
	Above 8000	2	1.94		3+	44	42.72

4.2. Evaluation of Measured Items

4.2.1. Reliability Test

Reliability refers to consistency in results when the same concepts are measured repeatedly with the same or similar measurement tools [46]. The concept can be described through the characteristics of stability, accuracy, consistency, and dependency. Reliability implies obtaining similar results when the same concepts are measured repeatedly and independently through the same or similar measurement tools [47]. The techniques employed for measurement include split-half reliability, item analyses, Cronbach's Alpha, equal measure reliability, and inter-rater reliability. When using criteria composed of various items from a single concept, Cronbach's Alpha is used to obtain the split-half reliability and yield the average value.

As this study used multiple measurements for the same concept, the Cronbach's Alpha coefficient was employed to examine the internal consistency of the derived factors. A Cronbach's Alpha coefficient above 0.6 or 0.7 is said to indicate relatively high reliability [48].

In this study, all items were found to have coefficients above 0.6. The total degree of reliability is 0.931, and, thus, the measured items are deemed reliable. A summary of the reliability analysis results is presented in Table 3.

<div align="center">Table 3. Analysis results of the reliability of measured items.</div>

Category		Number of Questions	Cronbach's α
Factors of Logistics Quality	Quality of Information	5 Items	0.705
	Quality of Order	5 Items	0.675
	Quality of Delivery	5 Items	0.798
	Price of Delivery	5 Items	0.704
	Customer Service	5 Items	0.817
Customer Satisfaction		4 Items	0.698
Intention for Repurchase		4 Items	0.799

Next, this study conducted a Kaiser-Meyer-Olkin (KMO) test based on Cerny and Kaiser [49]. A KMO value is obtained by adding the sums of the squares of the correlation coefficients and partial correlation coefficients. In general, it is used to test the efficacy of factor analysis. The greater the

partial correlation coefficients without the influence of the third variable are, the lower the KMO value. Correspondingly, the lower the partial correlation coefficients without the influence of the third variable are, the higher the KMO value is. Thus, if the correlation between variables is high, the KMO value is high. The higher the KMO value is, the more commonalities there are between variables, indicating that the conclusions of the factor analysis are appropriate. KMO statistics above 0.7 are statistically significant. Thus, a factor analysis is appropriate.

After performing the factor analysis, the KMO value is 0.833, as presented in Table 4. The result is statistically significant and appropriate for a factor analysis.

Table 4. Kaiser-Meyer-Olkin (KMO) and Bartlett testing.

	Approx. Chi-Square	1848.000
Bartlett Sphericity Test	Degrees of Freedom	528
	Significance Prob.	0.000

4.2.2. Validity Test

This study analyzed the determinants of logistics service quality through a factor analysis to evaluate the validity of the measurement indices. A factor analysis is conducted when evaluating the validity of the determinants of each distinct concept. Additionally, the research evaluates the representation of the tested factors in the original concepts.

The factor analysis uses a varimax rotation of principal components. The factors selected are those with eigenvalues above one, and each factor with a load value above 0.5 is deemed statistically significant.

In the model, the seven extracted factors that affect logistics quality are quality of information, quality of order, delivery price, quality of delivery, customer service, customer satisfaction, and intention to repurchase. The accumulated variate of the measured independent variables is 70.062, with 70.062% explanatory power. The results of a rotated factor analysis are presented in Table 5. Each factor is represented, in order, as QOI, QOO, POD, QOD, CSV, CSF, and IFR in the table.

4.2.3. Correlation Analysis

Correlation refers to the relationship between each variable. It refers to how the change in one variable leads to a change in the strength and/or direction of another variable. The closer the absolute value is to one, the higher the correlation is. Thus, "+" indicates a positive direction of change, whereas "−" indicates a negative direction.

As presented in Table 6, the correlation coefficients above 0.5 are as follows: quality of information-quality of order, quality of information-quality of delivery, quality of order-quality of delivery, quality of information-price of delivery, quality of order-price of delivery, quality of delivery-price of delivery, quality of order-customer service, quality of delivery-customer service, quality of price-customer service, quality of information-customer satisfaction, quality of delivery-customer satisfaction, and customer satisfaction-degree of repurchase. The other correlation coefficients between variables are below 0.5, indicating low correlations. As correlation coefficients do not usually exceed 0.5, it can be concluded that there are no multicollinearity problems.

Table 5. Factor load table after rotation.

		Factor	Factor	Factor	Factor	Factor	Factor	Factor	Eigen Value	Explanatory Power
QOI	A1	0.671							10.865	32.925
	A2	0.578								
	A3	0.895								
	A4	0.664								
	A5	0.518								
QOO	B1		0.671						2.715	11.226
	B2		0.632							
	B3		0.638							
	B4		0.620							
	B5		0.586							
POD	C1			0.723					1.976	6.987
	C2			0.549						
	C3			0.667						
	C4			0.770						
	C5			0.702						
QOD	D1				0.675				1.752	6.310
	D2				0.866					
	D3				0.739					
	D4				0.795					
	D5				0.633					
CSV	E1					0.796			1.343	5.070
	E2					0.658				
	E3					0.616				
	E4					0.689				
	E5					0.527				
CSF	F1						0.673		1.286	3.897
	F2						0.589			
	F3						0.734			
	F4						0.764			
IFR	G1							0.692	1.203	3.647
	G2							0.558		
	G3							0.722		
	G4							0.759		

4.3. Hypothesis Testing and Interpretation

To examine the effects of logistics service quality on customer satisfaction in the Chinese online shopping industry, this study conducted regression analyses by establishing five sub-factors as independent variables, with customer satisfaction as the dependent variable.

The results of testing the research hypotheses are as follows:

First, Hypothesis 1predicts that the quality of information positively influences online shopper satisfaction. The regression analysis of Hypothesis 1 gives a P value of 0.020 (<0.05), indicating a statistically significant correlation. Thus, Hypothesis 1 is accepted.

Hypothesis 2 predicts that the quality of order positively influences online shopper satisfaction. The regression analysis of Hypothesis 2 has P = 0.000 < 0.05, indicating a statistically significant correlation. Thus, Hypothesis 2 is accepted.

Hypothesis 3 predicts that the quality of delivery positively influences online shopper satisfaction. The regression analysis of Hypothesis 3 has P = 0.002 < 0.05, indicating a statistically significant correlation. Thus, Hypothesis 3 is accepted.

Hypothesis 4 predicts that a delivery fee positively influences online shopper satisfaction. The regression analysis of Hypothesis 4 has P = 0.042 < 0.05, indicating a statistically significant correlation. Thus, Hypothesis 4 is accepted.

Hypothesis 5 predicts that customer service positively influences online shopper satisfaction. The regression analysis of Hypothesis 5 has P = 0.000 < 0.05, indicating a statistically significant correlation. Thus, Hypothesis 5 is accepted.

Hypothesis 6 predicts that customer satisfaction positively influences customers' intention to repeat their purchase online. The regression analysis of Hypothesis 6 has F = 81.415, P = 0.000 < 0.05, indicating a statistically significant correlation. Thus, Hypothesis 6 is accepted.

These results indicate that as customers feel increasingly satisfied by online shopping, they tend to show more loyalty towards online shopping malls by repurchasing from the same mall or recommending it to other people.

Table 6. Correlation coefficients.

	QOI	QOO	QOD	POD	CSV	CSF	IFR
QOI	1						
	102						
QOO	0.680 **	1					
	0.000						
	102	102					
QOD	0.517 **	0.517 **	1				
	0.000	0.000					
	102	102	102				
POD	0.529 **	0.533 **	0.602 **	1			
	0.000	0.000	0.000				
	102	102	102	102			
CSV	0.484 **	0.506 **	0.548 **	0.618 **	1		
	0.000	0.000	0.000	0.000			
	102	102	102	102	102		
CSF	0.551 **	0.492 **	0.579 **	0.499 **	0.430 **	1	
	0.000	0.000	0.000	0.000	0.000		
	102	102	102	102	102	102	
IFR	0.603 **	0.520 **	0.582 **	0.494 **	0.528 **	0.670 **	1
	0.000	0.000	0.000	0.000	0.000	0.000	
	102	102	102	102	102	102	102

Notes: ** denotes $p < 0.01$; quality of information, quality of order, price of delivery, quality of delivery, customer service, customer satisfaction, and intention for repurchase are represented as QOI, QOO, POD, QOD, CSV, CSF, and IFR, respectively.

A summary of the hypotheses tests is presented in Table 7.

Table 7. Effects of customer satisfaction on intention to repurchase.

	Unstandardized Coefficient		Standardized Coefficient	t	P	F	P	AdjR2
	B	**Std. Error**	**Beta**					
(Constant)	1.173	0.302		3.888	0.000	81.415	0.000	0.443
Customer Satisfaction	0.726	0.081	0.670	9.023	0.000			

For the online shopping industry to secure a comparative advantage in China, good quality of information, quality of order, quality of delivery, friendly customer service, and adequate delivery charges were found to be the important factors that determine logistics service quality.

The experiment proves the importance of considering the standardized coefficients of quality of delivery ($\beta = 0.328$, t = 3.155) and quality of information ($\beta = 0.263$, t = 2.375) as higher than those of the other factors in logistics service quality. It proves that customer satisfaction rates have a stronger influence than any other factor influencing the logistics service quality of the online shopping industry. Furthermore, this study found that the quality of order ($\beta = 0.076$, t = 3.633) and customer service ($\beta = 0.015$, t = 3.801) exert influence. However, their influences are not as strong as those of the previous two factors. Thus, online shopping malls must realize the significance of improving the accuracy and quality of delivery.

The online shopping industry in China is affected by issues regarding delivery punctuality and damages incurred to products during the delivery process. Although many delivery companies are attempting to solve these problems, improvements are yet to be made. Thus, to successfully manage the logistics service quality, online shopping malls in China should focus on enabling fast, accurate, and safe logistics services.

5. Conclusions

5.1. Research Summary and Conclusion

This study found that the quality of an online shopping logistics service influences customer satisfaction, which drives repeat purchasing behavior. Five hypotheses were established to represent the relationship between customer satisfaction and each factor of the logistics service; namely, quality of information, quality of order, quality of delivery, price of delivery, customer service, and customer satisfaction. Each subject from a sample of 150 Chinese customers with online shopping experience was sent a questionnaire. The results of the empirical analysis show that the quality of a logistics service has a statistically significant impact on customer satisfaction and that quality of delivery is the main factor of influence. Furthermore, the results show that customer satisfaction has a statistically significant impact on repeat purchasing behavior. The results provide insights into the strategy behind China's fast-growing online shopping industry, which focuses on maintaining stability through long-term customer relationship management. The factors affecting customer satisfaction in the online shopping industry are quality of order, quality of information, quality of delivery, price of delivery, and customer service. Furthermore, customer satisfaction affects the intention to repurchase. In conclusion, strategic management of the factors that affect customer satisfaction can increase customers' intentions to repurchase.

5.2. Research Implications and Future Research Directions

The results of this research provide various theoretical meanings for online shopping logistics services, which can be considered for empirical analysis. This, in turn, can be used to suggest several policies and solutions to assist online shopping malls in establishing customer-oriented strategies that

improve quality management. This study suggests practical semantics to direct the operations and management of online shopping transactions and to effectively pursue customer-oriented strategies.

The implications of this study and future directions for research are as follows. First, the scale of online shopping in China is increasing gradually. Accordingly, the number of Internet users is increasing. China joined the World Trade Organization and signed a free-trade agreement with Korea in early 2016, and, thus, the documented information related to the Chinese online shopping industry is important for businesses attempting to enter the market.

Second, the literature on the logistics services of online shopping is insufficient, therefore warranting further research on leading variables. These determinants of logistics service quality were found to yield similar results to the factors related to online shopping mall success as well as the factors previously related to service quality. However, some limitations to these determinants remain. In the future, various determinant factors should be systematically researched and analyzed, enabling the extraction of factors constituting logistics service quality.

Third, online shopping logistics service is an important factor in competition between online shopping malls. Considering that the cost of return shipping is problematic, it is essential that this topic be studied further.

To extract and measure the determining factors of logistics service quality in online shopping, a method of measurement that eliminates subjectivity must be developed. An improved measurement index for customer satisfaction should also be created.

Fourth, the prediction by the 2017 information and technology (IT) market is that service platforms will continuously evolve in line with the mobile era. As the Chinese market transforms, many mobile-based online-to-offline (O2O) services are attracting large-scale investment and experiencing rapid growth.

O2O, a buzzword of the 2017 IT market, is a service devised to organically converge online and offline markets. Based on ICT, O2O attracts customers online and then provides them with services offline. In other words, customers purchase products and services online, and the actual services are provided offline. This is also referred to as a bilateral marketing technique.

Many countries around the world, including China and Korea, are utilizing O2O services that serve as the bridge between online payment and offline service. Examples include placing an order for food delivery, reserving a taxi, and searching for lodgings through a mobile application. As O2O services grow in diversity, so will their customer base. Future studies should develop indices and conduct research in this area.

Lastly, due to the small sample size in the empirical analysis, a structural equation model could not be used. This model may be employed as an alternative estimation approach with a large sample in the future.

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