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Influencing Factors of Customer Satisfaction in Internet Pharmacies in China: An Empirical Study

XIE Fangmin

Doctor of Management

Supervisor:

PhD Virginia Trigo, Professor Emerita,
ISCTE University Institute of Lisbon

December, 2023

Marketing, Operations and General Management Department

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December, 2023

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Internet Pharmacies in China: An Empirical
Study**

XIE Fangmin

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Abstract

Customer satisfaction is one of the core components of corporate marketing and customer relationship management. With the opening up of China's internet pharmaceutical regulations, internet pharmacies have experienced rapid growth. However, there is little research on customer satisfaction in this area. In-depth studies on the key factors affecting customer satisfaction in the internet pharmacy environment are crucial for enhancing business competitiveness.

Based on a review of literature, this thesis analyzes the characteristics of internet pharmacies. By combining expert interviews and practical corporate experience, a conceptual model of customer satisfaction for internet pharmacies has been set up. A pilot questionnaire survey was first developed, refined and then distributed to a large-sample of respondents. A total of 1788 valid questionnaires were statistically processed and a final model of customer satisfaction in internet pharmacies was designed and found to have a high degree of fit with the data.

The thesis also analyzes various factors within the model, ranking their impact on customer satisfaction as follows: corporate image > quality perception > customer expectation > value perception. The ranking for impact on customer loyalty is: corporate image > customer satisfaction > quality perception > customer expectation > value perception. Based on empirical research findings, this thesis provides suggestions to improve customer satisfaction for internet pharmacy platform businesses.

The findings of this study can help Internet pharmacy platforms understand the characteristics of their customer groups and the key factors affecting customer satisfaction and loyalty. By applying the research model, they may specifically improve and enhance these constructs, ultimately increasing the operational efficiency of the business.

Keywords: Internet pharmacies; customer satisfaction; customer loyalty

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Resumo

A satisfação dos clientes é um dos principais componentes do marketing empresarial e da gestão do relacionamento com os clientes. A abertura económica da China e a constituição de um quadro legal referente às farmácias on-line permitiu que este tipo de atividade tivesse um rápido crescimento. Contudo, a investigação sobre a satisfação dos clientes deste tipo de farmácias é ainda limitada, embora seja crucial para aumentar a competitividade empresarial.

Com base numa revisão de literatura, esta tese analisa as características das farmácias online. Combinando entrevistas a especialistas com a experiência empresarial, foi construído um modelo teórico de satisfação do cliente para farmácias online foi elaborado um questionário e realizado um teste piloto que deu origem ao questionário final. Este foi administrado a uma grande amostra da qual 1788 questionários foram considerados válidos. Após análise estatística concebeu-se o modelo final de satisfação do cliente em farmácias online o qual apresenta um elevado grau de adequação aos dados.

A tese também analisa vários fatores do modelo, classificando o seu impacto na satisfação do cliente da seguinte forma: imagem empresarial > percepção de qualidade > expectativa do cliente > percepção de valor. A classificação do impacto na fidelidade do cliente segue a seguinte lógica: imagem empresarial > satisfação do cliente > percepção de qualidade > expectativa do cliente > percepção de valor.

Com base nos resultados da investigação empírica, esta tese fornece sugestões para melhorar a satisfação do cliente nas empresas de plataformas farmacêuticas online. Ao aplicarem o modelo proposto, as plataformas de farmácia on-line podem melhorar não só a satisfação do cliente, mas também a eficiência operacional do negócio.

Palavras-chave: Farmácias on-line; satisfação do cliente; fidelidade do cliente

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摘 要

顾客满意度是企业营销和客户关系管理的核心内容之一。随着中国网售药品监管政策的开放，互联网药店企业得到迅猛发展，但对其顾客满意度的相关研究尚少。深入研究互联网药店环境下影响顾客满意度的关键因素对于提升企业竞争力十分重要。

本文在文献回顾基础上，分析互联网药店特点，结合专家访谈和企业实践经验，构建了互联网药店顾客满意度理论模型，然后利用小样本问卷调查数据对问卷进行预调研，形成最终的调查问卷。然后进一步完成了大样本实证研究，共收集到 1788 份有效问卷。经过统计分析，得到互联网药店满意度最终模型，该模型与数据拟合度较高。

本文同时分析了模型中多项因素，其对顾客满意的影响排序依次为：企业形象>质量感知>顾客期望>价值感知，对顾客忠诚的影响排序依次为：企业形象>顾客满意>质量感知>顾客期望>价值感知。基于实证研究结果，本文针对互联网药店平台企业给出了提升顾客满意度的建议。

基于实证研究结果，本文提出了提高互联网医药平台企业客户满意度的建议。应用研究模型针对性地改善和提高顾客满意度，最终达到提升企业经营效益的目的。

关键词：互联网药店；顾客满意度；顾客忠诚度

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List of Acronyms

ACSI	American Customer Satisfaction Index
APP	Application
AVE	average variance extracted
B2B	business to business
B2C	business to customer
C2B	customer to business
C2C	customer to customer
CCSI	Chinese Customer Satisfaction Index
CFA	confirmatory factor analysis
CITC	corrected item-total correlation
CR	composite reliability
CS	Customer Satisfaction
DFA	Deterministic Finite Automaton
ECSI	Europe Customer Satisfaction Index
EFA	exploratory factor analysis
GHX	global healthcare exchange
KMO	Kaiser-Meyer-Olkin
NMPA	National Medical Products Administration
O2O	online to online
SCSB	Sweden Customer Satisfaction Barometer
SEM	Structural equation modelling
WTO	World Trade Organization

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Chapter 1: Introduction

This chapter provides a comprehensive overview of the research background of this thesis. Upon elucidating the primary objectives and significant importance of this topic, it further presents the main challenges and issues to be addressed in the study.

1.1 General overview

In recent years, the rapid development of internet pharmacies in China has brought about a significant transformation to China's pharmaceutical retail market. This section analyzes the current status of Chinese internet pharmacies, the characteristics of the pharmaceutical consumer market, key elements of internet drug sales, and the importance of customer satisfaction in the operation of internet-based pharmacies.

1.1.1 Emergence and rapid development of Chinese internet pharmacies

In recent years, with the advancement of e-commerce and the internet+ industry in China, internet pharmacies have emerged as a new business model in the retail vertical sector (Jin, 2020; Y. Liu, 2020). As a form of direct business-to-customer (B2C) medical e-commerce in China, internet pharmacies differ from traditional hospitals and physical pharmacies. They utilize the internet to provide a wide range of public health-related products to individual consumers, including medicines, health supplements, medical equipment, as well as offering medical information and consultation services. Moreover, compared to traditional brick-and-mortar medical institutions, internet pharmacies exhibit features such as convenient consumer shopping, price advantages, comprehensive product variety, broad coverage, transparent information, privacy protection, and significant market potential (Y. T. Zhou, 2020).

With the gradual opening of national policies, the scale of transactions in China's internet pharmaceutical market is rapidly expanding. In 2005, National Medical Products Administration (NMPA) issued the Interim Measures for the Administration of Internet Drug Trading Services, which allowed pharmaceutical enterprises to sell over the counter (OTC) drugs online for the first time (NMPA, 2000). The Draft Measures for the Supervision and Administration of Internet Food and Drug Regulation (NMPA, 2018) attempted to permit

internet pharmacies to sell prescription drugs to consumers.

According to publicly available data (Minei Retailing, 2023), in 2022, the market penetration rate of online pharmaceutical sales in China was 14.5%, with a rapid growth rate. It is expected to reach 18.4% by 2025. As the Chinese government permitted the online sales of prescription pharmaceutical, the Chinese online pharmaceutical market is poised to embrace tremendous opportunities. The market size is anticipated to continue its growth trajectory in the future. This indicates significant developmental potential for internet pharmacies in the Chinese pharmaceutical market.

1.1.2 Consumer-level characteristics of the Internet pharmaceutical market

Compared to traditional pharmaceutical retail in the conventional market, internet pharmaceutical retail in the internet market offers convenience and affordability to a vast number of consumers. It caters to many consumers' needs for privacy protection and the freedom to choose medications (Hou & Yang, 2019; Y. K. Zhai et al., 2021). In the realm of pharmaceutical sales, the internet market boasts several distinctive features.

Firstly, operating costs in the internet market are notably reduced as there is no need for rent and traditional manpower. This reduction in operational costs translates into decreased selling prices for medicines, a concern of great importance to most consumers. Consequently, pharmaceutical product sales in the online market have gained increasing popularity among a significant number of consumers (Y. T. Zhou, 2020).

Secondly, the proliferation of internet pharmaceutical retail services provides immense convenience to consumers in their daily lives. Consumers can conveniently engage in one-stop medical consultation and medication procurement on internet medical e-commerce platforms without leaving their homes. This saves time and enhances efficiency for customers. For individuals who find it inconvenient to go out or lack sufficient time to visit traditional brick-and-mortar pharmacies, this convenience offers substantial benefits.

Furthermore, internet-based pharmacies can offer a diverse range of medication choices that might not be feasible for traditional physical pharmacies within geographical limitations. This greatly expands and respects consumers' freedom of choice, alleviates consumer concerns, and avoids monopolies and sales of various brand products that traditional pharmacies might impose. Within this internet market, consumers also have the freedom to choose from various medication manufacturers and brands.

Lastly, for certain illnesses that threaten consumer health privacy, individuals often need

to reveal their conditions directly to doctors or pharmacists at traditional pharmacies. Customers suffering from such sensitive conditions can procure the required medications through online medical platforms, thereby avoiding potentially judgmental gazes from the outside world and gaining access to extensive and cost-free communication opportunities (M. Zhang, 2018).

However, when viewed from a consumer perspective, unlike traditional pharmacy sales, internet pharmaceutical sales might encounter issues primarily in the following aspects, necessitating further exploration and resolution:

1) Trust issues: Concerns about medication quality and lack of trust in purchasing medicines online.

2) Lack of professional guidance: Users lacking medical expertise might struggle to discern the authenticity of information.

3) Timeliness of medication delivery: Due to general logistics, consumers often experience delays of 1 to 3 days in receiving their orders, which can significantly impact acute illnesses.

4) Ineligibility for current health insurance coverage: Corresponding health insurance policies have not yet been established.

5) Inadequate legal framework and lagging regulations.

It is precisely due to these distinct consumption characteristics of internet pharmacies compared to traditional physical pharmacies that customer satisfaction with the products and services offered by businesses will be influenced by different factors. Moreover, the nature and extent of these influences vary between the two contexts. It is only by focusing on these disparities that we can better serve customers and thereby attract more users to the enterprise (H. Y. Li, 2011).

1.1.3 Distinctive elements of the Internet pharmacy sales model

The scenario of internet pharmacies involves reaching consumers through online platforms, which exhibits several unique aspects when compared to traditional offline pharmacies. The following features set them apart:

1) Aspects of convenient browsing

The alteration brought about by online shopping is primarily rooted in a shift in the information flow of sales. User interface (UI) friendliness, including varied registration and login methods, intuitive search functionality, navigation, and categorization, directly impacts

customer satisfaction. This aspect is absent in the sales process of traditional brick-and-mortar pharmacies. The ease of user registration and login processes directly influences new customer influx and platform conversion rates.

The capability of offering a robust medicine search results engine, supporting fuzzy search queries, error correction in search results, rapid and precise localization of search results content, and even the utilization of current advanced technologies like artificial intelligence and data-driven ranking prioritization to enhance search efficiency is of utmost importance. Addressing the information overload challenge in online consumer product information necessitates the introduction of suitable online comparison and selection methods. The role of recommended medications is also vital. A systematic product comparison and analysis function, along with the display of various performance indicators, contributes to the perception of enhanced service convenience (Qiu, 2017a).

Additionally, with the trend of mobile internet development, emphasis should be placed on the convenience and immediacy for mobile users, gradually shifting the focal point of sales interfaces from desktop to mobile. This also requires continuous improvement based on the differences between the two platforms.

2) Aspects of ordering and payment convenience

The operational flow of funds in internet pharmacies differs from that of physical stores, a distinction dictated by the consumption scenario of online ordering and payment. The speed of real-time order processing, the level of automation, and intelligent handling of orders are all factors that can directly impact customer experience. Internet pharmacies strive to minimize costs paid by consumers in terms of scarce time resources and labor, thereby enhancing service convenience.

In terms of payment convenience, offering diverse payment methods, timely payment settlement, and ensuring the security of payment instruments directly influence user trust. Addressing customer doubts and reducing their time costs affect the perception of medication purchasing experience (Qi, 2020; Qiu, 2017a).

3) Aspects of logistics and delivery

Logistics is another distinct feature of online sales compared to offline sales, constituting a critical factor in the entire sales chain that cannot be ignored. The inherent characteristics of medications demand higher standards in logistics in terms of safety, quality, and timeliness compared to general merchandise. Internet pharmaceutical platforms constantly select and optimize socialized logistics support systems and, when necessary, construct proprietary logistics delivery systems.

To offer efficient delivery services within stipulated timeframes, it is essential to expand delivery coverage proactively, provide personalized delivery plans based on customer demands, and fully manifest the operational capabilities of the enterprise, ultimately enhancing customer satisfaction (Li & Qin, 2020; L. J. Li, 2020; M. Xu et al., 2019).

Additionally, special attention must be given to the specific transport conditions and requirements of certain medications, as well as the traceability of pharmaceutical logistics and delivery to ensure medication safety.

4) Aspects of after-sales service

The absence of face-to-face communication between internet pharmacies and customers poses new challenges in terms of after-sales service compared to traditional pharmacies. In various aspects of guaranteeing timely service responses, satisfying user replies, timely rectification of service errors, offering convenient solutions to issues, and ensuring user satisfaction with service compensation outcomes, the potential to impact customer satisfaction is substantial (Li, 2019; M. Xu et al., 2019).

Similarly, the application of artificial intelligence technology is indispensable in enhancing after-sales capabilities. In terms of technical support, compared to traditional brick-and-mortar pharmacies, the demands on internet pharmacies are significantly higher, and their scope of application and influence are much greater.

5) Aspects of pharmaceutical expertise

The production, distribution, and sale of pharmaceutical products are closely tied to national welfare. Pharmaceuticals have always been high-risk commodities subject to strict governmental control. The emergence of new internet sales models necessitates not only the enhancement of business professionalism while ensuring safety but also the improvement of convenience in consumer choices (Hong & Li, 2019; Luan, 2018).

Additionally, platforms must possess the capability to provide professional physicians and pharmacists to assist non-professional customers in selecting and safely using medications. The efficacy of this effort directly relates to customer satisfaction with platform services and impacts sales and corporate profits.

1.1.4 The significant impact of consumer satisfaction on business development

The foundation of business is the benefit to users. Consumer users have always been the focal point and subject of continuous exploration in the field of marketing. In the era of internet commerce, the equitability of information and the scarcity of traffic have led many businesses

to recognize the importance of customers. As the traffic dividend gradually diminishes, enterprises increasingly prioritize user experience and customer loyalty to achieve high conversion rates and repeat purchases. The value of a business stems from its existing and future customers. By acquiring, protecting, and nurturing customer resources, companies can cultivate loyal customers, thus attaining long-term competitive strength. Customer satisfaction consequently becomes a crucial focus for numerous enterprises. Elevating customer satisfaction serves as an effective means to achieve ultimate strategic objectives. Satisfied customers bring about repeated purchases and positive word-of-mouth propagation, aiding the establishment of a positive corporate image and brand reputation in the market. This allows the enterprise to capture a larger market share, generate more profits, and form a value chain comprised of consumer satisfaction, customer loyalty, and sales profitability (N. N. Wang, 2020; Zheng, 2020).

Furthermore, focusing on customer satisfaction and cost control necessitates an accurate understanding of the intricate relationship between customer satisfaction and operational performance, enabling better-informed decisions. Therefore, customer satisfaction, as a vital metric in the realm of marketing, consistently garners significant attention from researchers and business leaders both domestically and internationally.

Ensuring customer satisfaction is a pivotal factor affecting customer interest preservation. This is closely linked to a company's profitability and is an indispensable facet of its marketing strategy (Lei & Xin, 2019; Zhao, 2018).

According to a survey of online shopping customers, 80% of highly satisfied customers make a repeat purchase within two months, and 90% recommend the online retailer to others. Conversely, 87% of customers expressing dissatisfaction with the online shopping process will permanently abandon the online retail platform. This vast discrepancy directly influences customer retention and loyalty (Cheung & Lee, 2005).

Enhancing customer satisfaction leads to increased customer loyalty, decreased price elasticity, reduced transaction cost, and minimized information acquisition cost from customers. Simultaneously, it heightens the company's reputation and image, reduces failure costs, and shields users from competitor attacks. Thus, customer satisfaction poses a more challenging research topic. Internet retail enterprises must adopt comprehensive customer satisfaction management to attain sustained competitive advantage (Li, 2011).

Therefore, businesses, especially current internet platform enterprises, can use customer satisfaction as a key indicator, conduct targeted scientific assessments and continuous monitoring, analyze the data, and promptly adjust their operational strategies to improve

performance. On the other hand, feedback from customer satisfaction can stimulate product innovation, facilitate product and service improvements, and further enhance the company's competitiveness.

For internet platform enterprises, research into meeting customer requirements and expectations will gradually replace the pursuit of quality or service standards and become a higher goal for platform companies. Given the unique characteristics of consumer behavior and consumer satisfaction in the internet pharmaceutical market as discussed above, a thorough investigation into customer behavior and satisfaction is of paramount importance. For novel models in the realm of traditional internet pharmacies, effectively ensuring and serving customers, attaining consumer satisfaction, thereby enhancing customer loyalty, and subsequently improving business operations and sales, have become vital subjects that all internet pharmacies must address in the new landscape.

1.2 Research objectives

For enterprises to establish a strong position and ensure sustainable development in the fiercely competitive market, they must compete for consumer satisfaction through their operational activities and attract a large number of loyal customers through accumulated experience over time. One of the key components of modern Chinese enterprise online marketing is to achieve customer satisfaction. It is believed that customer satisfaction is the foundation for enterprises to acquire customers and ultimately generate profits by delivering tangible benefits to customers. Research indicates a significant positive correlation between customer satisfaction and customer loyalty (N. N. Wang, 2020). Simultaneously, an increase in customer satisfaction can lead to higher economic benefits for businesses (Y. Wang et al., 2021).

This thesis aims to investigate the customer satisfaction model and key influencing factors of internet pharmacies in the context of the rapid development of pharmaceutical e-commerce in China.

Focusing on the internet pharmacy, Jianke.com, which relies on third-party logistics, this study intends to build a customer satisfaction model for internet pharmacies. It will achieve this by conducting literature reviews and analyses of domestic and international pharmaceutical-related literature, combining personal experiences from practical work, and gaining insights from extensive interactions with customers of Jianke.com. The study identifies and summarizes various factors that influence customer satisfaction in the B2C

pharmaceutical e-commerce industry in China, analyzing the importance of different influencing factors in the context of online drug purchasing.

Statistical tools were utilized to optimize the customer satisfaction model, aiding enterprises in better understanding customer satisfaction and facilitating the implementation of effective customer satisfaction intervention marketing strategies. The study aims to provide theoretical support and empirical references for the development of China's internet pharmaceutical enterprises. The main objectives of this thesis are as follows:

1) Based on previous literature reviews and research, along with personal experiences and interactions with a substantial number of pharmaceutical internet customers, an analysis of factors influencing customer satisfaction was conducted. This culminated in the establishment of a customer satisfaction theoretical model tailored to China's specific circumstances in the internet pharmacy domain.

2) The constructed internet pharmacy customer satisfaction theoretical model was applied in empirical research conducted on the Jianke.com Online Pharmacy. Statistical tools were employed to further optimize the model, ensuring its feasibility and providing empirical data and experience for the industry's development.

1.3 Research significance

The primary significance of this research can be summarized as follows:

1) Contribution to the development of customer satisfaction theory

Developing and validating theories and models is a crucial aspect of academic research. This study aims to construct and validate a customer satisfaction model in the context of internet pharmacies from a multidisciplinary perspective. It also involves empirical research on the factors influencing pharmaceutical e-commerce platforms. The theoretical and empirical findings of this study provide a comprehensive and meaningful reference for understanding consumer behavior and customer satisfaction in online drug purchasing.

2) Guiding Internet pharmaceutical enterprises in implementing customer satisfaction strategies

Customer satisfaction directly correlates with market share. Identifying key factors that influence online shopping satisfaction can enable e-commerce platforms to allocate resources effectively, implement targeted marketing strategies, and improve customer satisfaction. This research offers practical guidance for enhancing customer satisfaction and loyalty by informing the rational allocation of resources and the implementation of effective marketing

strategies within online shopping enterprises.

1.4 Research problem

Customer satisfaction is a crucial factor in business operations, particularly for B2C internet pharmacy enterprises, where customer attitudes can determine the success or failure of a platform. However, research on customer satisfaction models specific to internet pharmacies in China remains limited. The various key factors influencing customer satisfaction within internet pharmacies are not yet well understood. Addressing these research dilemmas is essential to effectively utilize customer satisfaction models and metrics for improving business efficiency.

1.4.1 Exploration needed for customer satisfaction models applicable to current internet pharmacies.

While customer satisfaction and its consequent effects on word-of-mouth, customer loyalty, and platform performance are widely acknowledged as vital for the development of internet pharmacies, the applicability of commonly used customer satisfaction models to the specific purchasing scenarios of internet pharmaceutical platforms remains to be studied. Establishing a customer satisfaction research model suitable for internet pharmacies is fundamental for accurately assessing and evaluating user operations within such platforms.

1.4.2 Uncertainty surrounding various factors and their correlations affecting internet pharmacy customer satisfaction.

Customer satisfaction is a crucial indicator for internet pharmacies, yet the specific factors influencing customer satisfaction within the context of internet pharmaceutical platforms, as well as their individual contributions, remain unclear. Identifying clear and significant influencing factors and targeting them for improvement through operational means directly promotes sustained business growth.

1.4.3 Exploration needed on how internet pharmacies can utilize customer satisfaction metrics to enhance operations and performance.

The ultimate goal of customer satisfaction research is to better serve customers, establish a positive company image, enhance customer retention and conversion, boost customer loyalty,

and ultimately foster the development of internet pharmacies. However, how theoretical models established in research, as well as the identified factors influencing customer satisfaction, should be prioritized and adjusted within business operations, and the actual effects of these adjustments, remains unknown. It is crucial to validate and summarize theoretical models through case studies, which involve targeted adjustments to influencing factors within specific contexts. Only through a focused adjustment of factors combined with observed improvements and enhancements in relevant business indicators can the correctness and practicality of theoretical models be validated.

1.5 Research questions

Research Question 1: What factors influence customer satisfaction of internet pharmacies?

This study plans to begin with a literature review, referencing historical research findings, to theoretically study and analyze potential factors that could influence customer satisfaction. Subsequently, considering the purchasing environment and customer characteristics within the internet pharmacy ecosystem, this study incorporated expert opinions through interviews to select plausible influencing factors. With this information, the study constructed a customer satisfaction index model and conduct empirical analysis and validation.

Research Question 2: What is the extent of the contribution of various key factors to customer satisfaction?

Based on the work experience and relevant literature, this study hypothesizes that the following factors may significantly impact customer satisfaction in online pharmacies: corporate image, perceived service quality, perceived product quality, perceived value, perceived medical professionalism, logistics experience, and customer expectations. This study aims to validate this hypothesis through empirical model research and factor analysis, thereby quantifying the respective contributions of these elements to customer satisfaction. Understanding the magnitude and importance of different factors' contributions to customer satisfaction in the context of online pharmacies will guide enterprises or platforms in focusing on key elements to enhance customer satisfaction in their future development.

Research Question 3: Can a reliable customer satisfaction model for internet pharmacies be developed?

Based on the research findings, this study proposes a customer satisfaction theoretical model. A large-scale empirical study tailored to the context of Jianke.com Online Pharmacy's operations was conducted. This study involves analyzing data fit and ultimately validate and

refine the model accordingly.

1.6 Research methods

This study emphasizes the combination of theoretical research and empirical research in its research methods. Literature review and theoretical research provide a theoretical foundation for problem formulation and the construction of the customer satisfaction model. Empirical research, on the other hand, involves validating the model using survey data to provide evidence for analyzing and addressing the research questions. The research employs methods such as literature analysis and the questionnaire survey, as outlined below:

1) Literature analysis: This study collects and organizes literature related to customer satisfaction, internet pharmaceutical e-commerce, medical services, and related fields to understand the current research status in these domains. This step helps clarify the research direction.

2) Questionnaire survey: Through online electronic questionnaires, the study conducts preliminary and formal surveys targeting both new and existing customers who have purchased medication from Jianke.com Online Pharmacy.

3) Statistical analysis: Descriptive statistical analysis is performed on the sampled data obtained through the survey to understand the structure and distribution of the survey sample, providing insights into the basic statistical characteristics of the data. The initial theoretical model is set using the structural equation model (SEM) method, examining the relationships between variables within the model and validating relevant theoretical models and hypotheses.

1.7 Technological route

Based on the research steps and methods employed, the technological roadmap for this study is depicted in Figure 1.1.

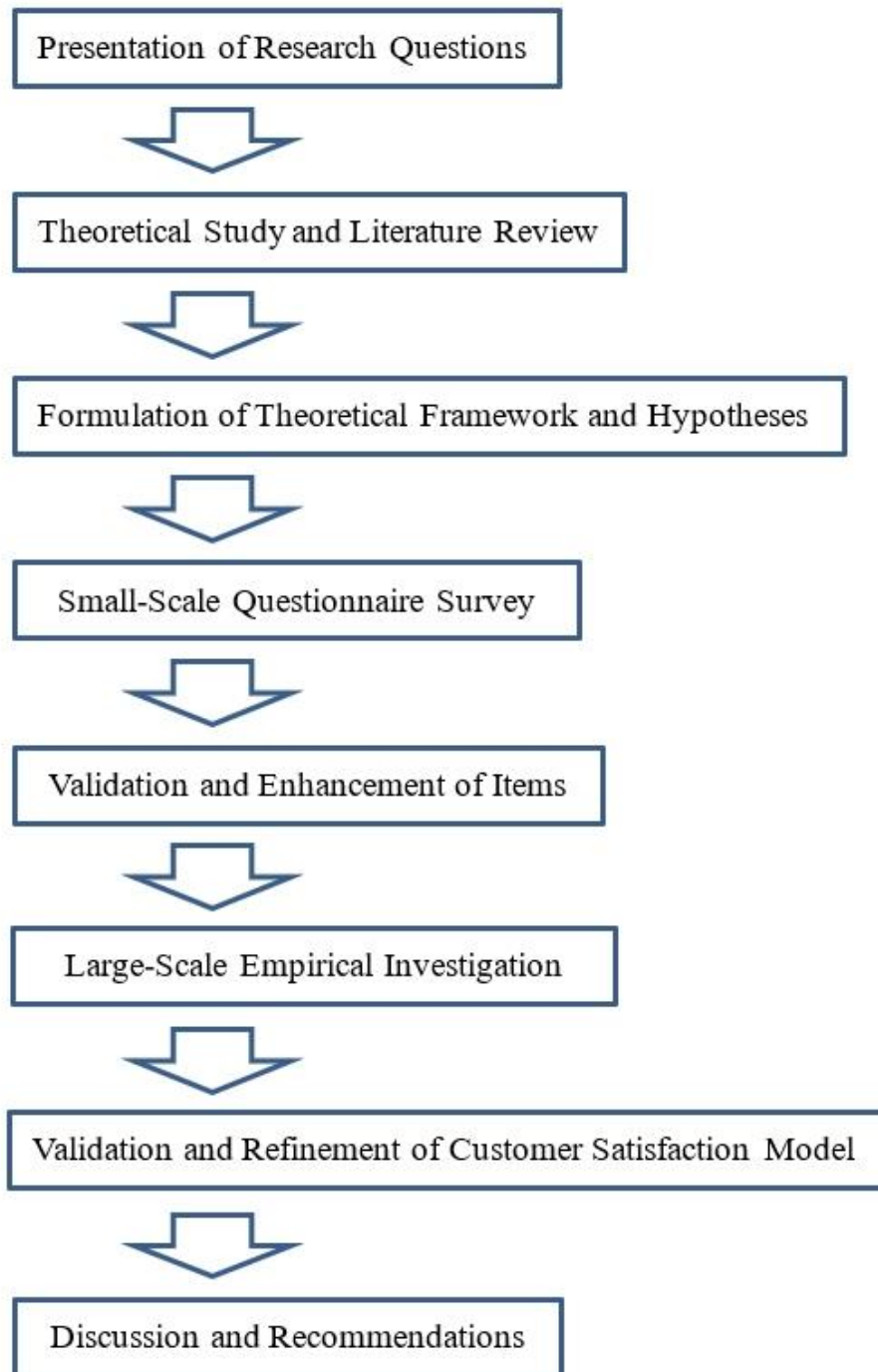


Figure 1.1 Technical roadmap of this study

Chapter 2: Literature Review and Theoretical Framework

2.1 Literature review

The rapid development of the pharmaceutical e-commerce sector has garnered significant attention and research from scholars. This emerging business form has also brought forth numerous challenges to the market. This section reviews the scholarly literature on e-commerce platforms, the history and key theories of customer satisfaction models, and extensively analyzes research literature concerning the crucial factors influencing customer satisfaction.

2.1.1 Current development and issues in pharmaceutical e-commerce

The development of e-commerce platforms and related technologies serves as the foundation for the growth of pharmaceutical e-commerce. This section examines the concepts of e-commerce platforms and pharmaceutical e-commerce platforms, discussing their development, existing issues, and corresponding strategies.

1) Concept and classification of e-commerce platforms

a. Concept of e-commerce platforms

The concept of a platform in economics initially referred to a specific space or place where users could engage in transactional activities (S. J. Wang, 2003). In the context of e-commerce platforms, it specifically denotes a designated space or place for conducting electronic commerce activities through internet technologies. Electronic commerce, in turn, involves the utilization of e-commerce theories and practices, predominantly reliant on information technology. It encompasses commercial activities conducted through processes such as network communication and computer technologies (J. Xu & Zhang, 2006).

Different organizations have offered varying definitions of electronic commerce. In 1997, the World E-commerce Conference defined electronic commerce as trade activities conducted through electronic information. This definition comprises two dimensions: a scope dimension wherein trading entities abstain from traditional trade methods, opting for electronic means to complete the entire trade process, and a technological dimension encompassing multiple technology applications including data acquisition, exchange, and processing (J. Xu & Zhang,

2006). The World Trade Organization (WTO) defines electronic commerce as trade activities involving the use of electronic information networks for manufacturing, sales, and other trade-related activities. This definition expands upon the earlier World E-commerce Conference's definition, encompassing not only the utilization of network technology for commercial trade but also the use of internet technology to streamline the entire online and offline process from raw material production to product sales. It also includes the utilization of various network information technologies to enhance operational efficiency in business activities, encompassing cost reduction and time savings for enterprises (Shao et al., 2003).

Therefore, scholars believe that the composition of an e-commerce platform primarily involves four elements: participating entities, telecommunication tools and networks, commercial activities, and specific spaces and places. Participating entities refer to the carriers of commercial activities, such as interactions between enterprises, enterprises and users, and user-to-user interactions. Telecommunication tools and networks encompass devices like mobile phones, computers, and network technologies. Commercial activities involve trade, electronic payment, advertising, and promotional activities. Specific spaces and places refer to tangible or intangible spaces where various commercial activities are conducted (A. B. Wang, 2021).

b. Classification of e-commerce platforms

Based on different operational modes, e-commerce platforms can be categorized into four distinct business operation types: B2B (Business to Business), B2C (Business to Customer), C2C (Customer to Customer), C2B (Customer to Business) (Kalakota & Whinston, 1997), and the subsequently developed O2O (Online to Offline) model.

The B2B model caters to corporate clients, engaging in wholesale transactions. A typical example in the pharmaceutical e-commerce domain is Pharmacist Help. Addressing the needs from pharmaceutical companies to drugstores constitutes the core value of the B2B model, as it enhances the commercial circulation efficiency of pharmaceutical products (S. W. Zhang, 2019).

The B2B model encompasses several specialized transaction modes, including shallow-level services such as providing reverse group purchasing services for individual pharmacies and deep-level services involving delivering drugs to stores for pharmaceutical manufacturers. In an environment where the trend of offline channel integration is intensifying, the B2B model effectively alleviates numerous pain points in the distribution process for pharmaceutical manufacturers, thus garnering support from numerous pharmaceutical enterprises. However, the weakness of the B2B model lies in its growth being highly

influenced by offline geographical expansion, requiring strong offline resource integration capabilities for expansion efforts. Furthermore, the business models and logic of online and offline operations differ significantly, necessitating distinct thinking patterns and the allocation of sufficient resources and capabilities for offline expansion (S. W. Zhang, 2019).

Another relative shortcoming is that the B2B model targets strong B-side clients, with the primary source of business profits stemming from volume-based success, making low profit margins inherent. Expanding sales volume and scope also pose challenges for the B2B model.

The B2C model primarily involves pharmaceutical e-commerce enterprises directly selling drugs to individual consumers through the internet. Since the majority of drug sales channels currently originate from medical service institutions, pharmaceutical e-commerce targeting end consumers faces difficulties in acquiring a sufficient customer base, leading to long market cultivation cycles. These pharmaceutical e-commerce companies often operate as platform-based e-commerce businesses, with notable examples being Alibaba's Alibaba Health, JD.com Health, and the subject of this study, Jianke.com Online Pharmacy.

Compared to traditional brick-and-mortar pharmacies, the B2C model holds various advantages. Firstly, the number of product stock keeping units (SKUs) available for sale is significantly higher online, allowing consumers to freely select, compare, and purchase the required drugs in one go. Secondly, selling drugs online can eliminate unnecessary distribution stages, lowering costs from the source and providing consumers with more affordable prices. Lastly, consumers in remote third- and fourth-tier cities can conveniently purchase necessary drugs without leaving their homes, enjoying the same pharmaceutical resources as large cities, thus mitigating regional imbalances. Due to the cost and price advantages inherent to this model, along with the intensifying trend of offline channel integration and the continuous expansion of platform scale, the B2C model is likely to gradually surpass the B2B model and become the dominant business model in the pharmaceutical e-commerce industry.

The O2O model refers to a business model where consumers place orders online and receive deliveries from offline pharmacies. The key advantage of the O2O model is its light asset structure, which completes the transaction loop by establishing a platform and directing traffic to offline terminals. However, due to the dense distribution of offline pharmacies and consumer traditional habits, O2O primarily serves as a marketing platform for drugstores, with the final transactions more likely to occur offline than online.

Taking the representative enterprise of the O2O model, Dingdang Kuaiyao, as an example: Dingdang Kuaiyao's core promise is to deliver medicines to customers for free within 28

minutes within its core service area. This model offers significant convenience to regular consumers, especially those urgently in need of medication. Nevertheless, while the surface-level service almost reaches its peak, it still faces a series of issues such as uneven pharmacy distribution, challenges in delivery timeliness, and cost control difficulties.

C2C and C2B models hold a relatively small market share at present, and thus will not be discussed in detail in this section. The entire internet commerce sector continues to explore better business models and innovative products/services. Enterprises in the e-commerce market employing B2B, B2C, and O2O models continually experiment, explore, and face market tests. For the entire pharmaceutical e-commerce industry, the choice of model is not the most critical aspect; what truly matters is actively leveraging internet technologies and concepts to create more efficient, customer- and socially valuable business models and methods within the traditional pharmaceutical sector, ultimately ensuring sustained existence and growth.

Although the subject of this study, Jianke.com Online Pharmacy, has deeply cultivated the pharmaceutical e-commerce field for decades and has become one of the benchmark companies in the pharmaceutical e-commerce industry, it still faces survival challenges every moment due to increasing industry competition and the decline of internet traffic dividends. The entrance of two major platforms, Alibaba Health and JD.com Health, has further intensified these challenges. Returning to customer research, conducting in-depth investigations to analyze customer pain points, constructing a comprehensive customer satisfaction system, driving continuous improvement in customer (user) satisfaction, and genuinely prioritizing customer-centric service are crucial directions for Jianke.com Online Pharmacy to break free from the constraints of competition from these internet giants and continue to thrive.

2) Development and trends of e-commerce

The global development of e-commerce experienced rapid growth since the 1990s. In the 21st century, e-commerce has witnessed explosive expansion, leading the world into the era of e-commerce economy (Y. Liu, 2016). It is believed that the future trends of e-commerce can be summarized as follows:

a. Mobile and internet of things (IoT) integration

According to authoritative surveys by the International Telecommunication Union, as of December 2015, the global internet user population reached 3.2 billion, while the global number of mobile phone users reached 7.1 billion, accounting for 95% of the global population (S. L. He, 2014). Mobile applications offer features such as portability, real-time

information transmission, powerful additional functions, and voice recognition. As a result, the proportion of mobile device usage far surpasses that of PCs. Therefore, the future development of e-commerce will predominantly manifest on mobile devices, and in recent years, mobile applications have become capable of fully replacing PC applications. The invention and application of various high-tech devices within the IoT in the future will undoubtedly bring about new application scenarios for e-commerce.

b. Artificial intelligence (AI)

With the advancement of software and hardware technology, the development of cloud computing technology based on the era of big data, and the application of new technologies such as artificial intelligence and machine learning, it is possible to intelligently process the vast amount of data and information resources available on websites. For instance, by analyzing user browsing habits and operation histories, AI can generate personalized optimization solutions for users, implementing a tailored and targeted service approach. This ultimately enhances user consumption experiences and caters to a wider array of personalized needs through intelligent means.

c. Comprehensive cloud service solutions

Cloud services and e-commerce are the major trends of the Internet + lifestyle. Numerous e-commerce enterprises no longer focus solely on the e-commerce platform itself, but continually expand their capabilities, including logistics, event marketing, integrated system capabilities, and financial insurance services. These capabilities, offered through various combinations of applications, provide different e-commerce solutions to enterprises, suppliers, and partners. They can play a more effective role, and with increased capabilities, more services are expected in the future. In other words, the capabilities developed by various companies can be integrated and shared as common resources for the e-commerce industry through cloud services.

d. Application of big data

One significant resource of e-commerce platforms is the massive volume of user transaction data. How to mine and apply this data to improve business efficiency and productivity is a hot and promising research topic. Early e-commerce platforms primarily gained profits through price differences and profits from e-commerce positions. In reality, e-commerce profit models have been progressively upgraded. The next level involves marketing supplier products and deriving profits from rebates and sales generated through promotional activities (F. Liang, 2012).

As the platform continuously grows, its profitability gradually shifts towards relying on

the platform itself. When it possesses traffic and customers, it charges platform usage fees and commissions to enhance profitability. Further platform profit models depend on the platform's financial capabilities, i.e., providing a variety of financial services for enterprises and entrepreneurial businesses in need of funding and earning profits from them. Presently, some mainstream e-commerce platforms like Alibaba and JD.com offer this model.

However, all of this relies on the integration and application of big data. Raw data is dispersed, one-sided, and of minimal value. The future profitability trend of platforms lies in the application of big data. This entails having a substantial amount of e-commerce customer behavior data and utilizing these data through comparisons to fully realize their value. This capability represents a higher level of profitability for e-commerce. All data requires a collection process, and these data become information through comparison and analysis. Further mutual confirmation of information leads to the construction of user models.

At this point, the structured user models generated from extensive data can be employed to support decision-making, becoming our knowledge. Through accumulation, this knowledge can be applied universally, thereby grasping truths and acquiring wisdom. Therefore, in the overall upgrade, data elevation, and enhancement of data value, the value of big data can be fully realised.

3) Definition and classification of pharmaceutical e-commerce platforms

a. Definition of pharmaceutical e-commerce platforms

Pharmaceutical e-commerce involves integrating the traditional pharmaceutical industry with information technology to create a novel business operation model. The market share of pharmaceutical e-commerce has been steadily increasing and has established a strong presence within the e-commerce market, showing promising prospects for the future. The emergence of pharmaceutical e-commerce significantly transforms the operational mode of the traditional pharmaceutical industry and brings about a renewed vitality.

In the Administrative Measures for the Supervision and Management of Pilot Pharmaceutical E-commerce released by the National Medical Products Administration on June 26, 2000, pharmaceutical e-commerce is defined as various business and service activities conducted and completed by drug producers, operators, or users through information network systems using electronic data information exchange (Cheng, 2010).

Other definitions include pharmaceutical e-commerce refers to the profit-driven business activities and service exchanges of pharmaceutical enterprises and pharmaceutical information service providers, using Internet technology (Shi & Huang, 2018). Furthermore, some scholars suggest that pharmaceutical e-commerce is an operational mode that treats

pharmaceuticals as special commodities, facilitating pharmaceutical business and sales (Yan, 2015).

In China, pharmaceutical e-commerce models mainly include B2B and B2C. B2B pharmaceutical e-commerce primarily serves institutions, while B2C pharmaceutical e-commerce mainly offers online purchase of medicines, medical equipment, and related diagnosis and treatment services to the general consumer population. Looking at the overall trend, the market share of B2C pharmaceutical e-commerce is growing while the B2B market share is declining. The B2C model of pharmaceutical e-commerce has a promising future.

Different scholars have given varied definitions for B2C pharmaceutical e-commerce: some suggest that B2C e-commerce is an online transaction model through which companies sell goods and provide services to users via the Internet (G. Ma & Li, 2013).

Based on research into user experiences on B2C e-commerce platforms, it is proposed that B2C is a mode of transaction between enterprises and users through online platforms, and the factors and models influencing user experience are summarized (W. Q. Pan, 2018). Some scholars define B2C e-commerce platforms as platforms that facilitate various transaction activities, business activities, and financial services between companies and users through the Internet and various communication methods (A. B. Wang, 2021). In the context of B2C platforms, online retailing is also referred to as an invisible shopping environment where customers can complete the entire process of selecting products, placing orders, and making online payments without visiting physical stores (J. Yang & Li, 2014).

Another definition states that a B2C e-commerce platform is an online trading platform where selling enterprises sell products and services to buying customers. It also summarizes eight core elements that e-commerce platforms' transactions should include: target markets and consumers, pricing systems, credit, logistics systems, online payments, revenue, after-sales service, and core competitiveness (Z. L. Liu, 2009).

b. Classification of B2C e-commerce platforms

This study primarily focuses on B2C pharmaceutical e-commerce platforms for research, while other types of pharmaceutical e-commerce platforms such as B2B are not deeply explored. To meet the diverse needs of consumers, B2C e-commerce platforms can be classified into different types based on various development strategies.

From a development strategy perspective, B2C e-commerce platforms can be categorized into three types (C. Yang & Zhao, 2010): self-operated, platform-based, and integrated. Self-operated e-commerce involves a pure self-operated business model. Companies establish their own e-commerce platforms, shape their corporate image, and consumers purchase medicines

on these platforms based on brand recognition and trust in the pharmaceutical e-commerce enterprise (Jing, 2016).

The advantages of these self-operated e-commerce platforms include targeted provision of pharmaceutical services to their customer base and efficient drug distribution through chain pharmacies. However, the flow of traffic is limited, and the initial investment is relatively high. Such platforms lack the “two-sided effect” of true Internet business models; instead, they have centralized interactions, resulting in relatively lower valuations compared to platform-service-oriented enterprises.

Representative examples of self-operated e-commerce companies include Jianke.com Online Pharmacy and YHD, where third-party merchants are not involved. Platform-service-oriented companies provide virtual spaces and places for enterprises and merchants to sell goods or services to users. The platform itself does not engage in transaction activities, examples include Tmall and Taobao. Integrated platforms combine the self-operated B2C e-commerce model with the platform-based e-commerce model. These platforms sell products to users through their own Internet platforms and simultaneously offer Internet transaction platforms to third-party enterprises and merchants, allowing them to sell products to users. Examples include Amazon and JD.com.

From the perspective of B2C e-commerce platform operating models, platforms can be classified into two types: comprehensive and vertical (X. L. Huang, 2020). The original comprehensive operating model is the B2C e-commerce platform operation model. Enterprises and merchants offer a variety of goods to users through this model to meet diverse consumer needs, such as JD.com and Amazon. Comprehensive e-commerce platforms have a wide range of products and categories, covering everyday items, clothing, shoes, fresh produce, electronics, digital appliances, books, videos, and more. These platforms use unified logistics and provide comprehensive after-sales service. Payment methods include both online payment and cash on delivery.

Since this model is mostly self-operated or integrated, companies value their reputation, with customer-centric values, such as Amazon’s commitment to unparalleled customer service. This high level of commitment builds trust among users towards comprehensive e-commerce platforms. The vertical operating model focuses on a specific domain, such as Jianke.com Online Pharmacy and Kangaiduo in the pharmaceutical e-commerce field. The advantage of vertical e-commerce platforms is their deep cultivation and specialization in a specific industry, enabling them to gain industry advantage and a dominant position. However, the limitations in terms of product categories and relatively lower transaction frequency are

evident, resulting in inherent weaknesses in terms of user traffic and stickiness. Therefore, vertical e-commerce platforms need to pay more attention to enhancing customer satisfaction and operational aspects.

4) Overview of foreign pharmaceutical e-commerce platforms

a. Overview of Pharmaceutical E-commerce Platforms in the United States

The development of pharmaceutical e-commerce began in the United States. The United States pharmaceutical industry vigorously embraced pharmaceutical e-commerce when internet technology became popular in the 1990s. In the initial stages of pharmaceutical e-commerce development in the United States, there was a general focus on improving pharmaceutical companies' Electronic Data Interchange (EDI) technology. The mature application of this technology effectively reduced paper-based operations, controlled drug inventory, and organized production processes, thereby enhancing pharmaceutical manufacturing levels. The promotion and application of EDI technology in American pharmaceutical companies laid a solid foundation for the development of pharmaceutical e-commerce (Fang, 2005).

Building upon this foundation, American pharmaceutical companies also introduced advanced management concepts such as material requirements planning, enterprise resource planning, supply chain management, and customer relationship management into their management practices, achieving unified management of company production, logistics, and personnel. This integration allowed real-time information sharing among related enterprises, resulting in integrated supply chain management. This played a crucial role in cost reduction and efficiency enhancement across the industry (Ge et al., 2008).

Furthermore, the rapid development and refinement of e-commerce in the US can be attributed to the country's distinct social division of labor: macro-level promotion by the government, local government focus on platform construction, and internal corporate networks interconnected with the internet. According to survey data, over 60% of US internet users consult and purchase medical products online, and internet drug sales account for over 30% of total drug sales. The world's largest drug trading network is established in the US (L. Q. Liu, 2017; R. Y. Tian, 2017).

After nearly two decades of development, pharmaceutical e-commerce in the United States has evolved into multiple mature operational models based on B2B, B2C, and third-party pharmaceutical e-commerce platforms. Representative models include the Global Healthcare Exchange (GHX) and Cardinal Health models.

GHX Model: GHX serves as a global pharmaceutical trading center, primarily offering

online trading services for pharmaceutical companies and medical institutions. GHX provides customers with ERP integration services, contract management, enterprise development guidance, and establishes industry standards based on the Universal Medical Device Nomenclature System. This fosters necessary conditions for data communication between pharmaceutical enterprises and medical institutions, enhancing transaction accuracy. The Content Intelligence Center in this system can automatically identify and correct inaccurate data information in procurement orders from medical institutions and pharmaceutical companies, resending orders to buyers and sellers for confirmation. This reduces manual intervention, decreases order error rates, accelerates industry capital turnover, and enhances drug trading efficiency.

Cardinal Health Model: The Cardinal Health model involves the distribution of company-related pharmaceutical products by the Cardinal Health company. This model engages in online pharmaceutical sales and is also dedicated to internet medical institution management, chain pharmacy management, and drug distribution management. It fully leverages the intensive management advantages of pharmaceutical sales, utilizing the company's central position in the pharmaceutical value chain to achieve cross-selling between internal operations and customers (J. Yang, 2003).

The American pharmaceutical market is relatively mature, with high industry concentration. The US has approximately 67,000 pharmacies, meaning that each retail pharmacy serves approximately 4,800 individuals (Jin, 2020). The top three retail pharmacies in the US are Walgreens, CVS, and Rite Aid, collectively accounting for over 50% of the market share. This level of concentration in the US pharmaceutical retail industry far exceeds that of China (Niu, 2015).

Due to differences in pharmacy concentration between China and the United States, the development of pharmaceutical e-commerce platforms has taken a different path. The United States pharmaceutical retail channels primarily consist of offline and mail-order forms. Offline refers to physical retail pharmacies, while mail-order channels include the pharmaceutical mail-order business of Pharmacy Benefit Management (PBM) companies. After obtaining a prescription, users input the prescription number on the PBM company website and have the medication mailed to them. The three largest companies in PBM drug mail-order services are Express Scripts, Caremark under CVS, and OptumRx under United Health (Jin, 2020; Ou, 2018).

Pharmaceutical e-commerce in the United States has mostly developed by integrating online and offline scales. The e-commerce sales channels of US pharmaceutical retailers

mainly consist of self-established official websites, and the actual scale of e-commerce sales is only about 1%. In 2018, CVS achieved sales of \$194.5 billion, making it the largest pharmaceutical retail company in the United States. However, compared to the overall pharmaceutical sales in the US, this proportion remains relatively small (Jin, 2020).

Moreover, the operating models of pharmaceutical e-commerce in the United States differ significantly from those in China. CVS and Walgreens pharmacies have various models, such as general community retail pharmacies, pharmacies with one-minute clinics, and supermarket-like pharmacies. Their product categories include food, convenience items, medicines, and cosmetics. Some stores even have one-minute clinics. These stores offer not only prescription and non-prescription drugs but also beauty and health care products, as well as non-pharmaceutical products such as household items, convenience products, fresh food, and personal care products.

b. Development of pharmaceutical e-commerce in European countries

Pharmaceutical online sales are also widespread in Europe. Among the pharmacies certified by the European Pharmacists Association, over 90% of them offer online drug reservation services (R. Y. Tian, 2017).

In Germany, the government has strict regulations that limit the online and offline sales of medications to pharmacies only. Not only the government, but also professionals in the pharmaceutical industry oppose online sales of drugs, whether prescription or over-the-counter. This is primarily due to concerns about drug safety. However, Germany boasts a robust internet infrastructure. With the development of pharmaceutical e-commerce throughout the European region, German pharmacies have embraced online business. Many pharmacies have their own online portals. Currently, the number of online pharmacies in Germany surpasses that of other countries in the entire European region.

The development of the internet in France is the lowest across the entire European region. Similar to Germany, the French government imposes stringent requirements on the development of medical e-commerce. As a result, uncertainties persist in the development of medical e-commerce in France. Despite Italy's pharmaceutical regulatory authorities strictly prohibiting pharmaceutical companies from retailing drugs to consumers via the internet, pharmacists can provide drug consultation services online to patients. The government also advocates for B2B pharmaceutical e-commerce transactions among pharmaceutical companies. In the Netherlands, due to a lenient regulatory environment, while the online sales of prescription and over-the-counter drugs are relatively modest, they are on the right track. 7% of Swedish households opt for online shopping. The Swedish people have high hopes for

the development of medical e-commerce, anticipating that it will bring greater convenience to their lives (L. Q. Liu, 2017).

In Switzerland, 16% of medications are sold online or through mail orders. Because the European Union's restrictions on cross-border online drug sales are relatively relaxed, Switzerland's online drug sales cover almost the entire European region. In the United Kingdom, the Royal Society has also established a series of industry standards for the development of online pharmacies, and the government has issued a white paper supporting e-commerce development (D. Wang, 2007).

Clearly, European countries' e-commerce landscape for pharmaceuticals will exhibit polarization: some nations may become advanced in pharmaceutical e-commerce, such as the Netherlands, Sweden, Switzerland, and the United Kingdom. However, the development of pharmaceutical e-commerce in other countries, including Germany, France, and Italy, is progressing slowly (D. Wang, 2007). The root causes lie in the varying levels of government support for the development of medical e-commerce in different countries and disparities in people's awareness of medical e-commerce, leading to significant differences in the development of medical e-commerce in each country.

Japan also places high importance on the development of its domestic pharmaceutical e-commerce. Japanese pharmaceutical e-commerce has two main features: a) Shared pharmaceutical logistics distribution centers. This significantly reduces inventory and distribution costs for Japanese pharmaceutical companies, and it accelerates the circulation of drugs in the market. b) A mature pharmaceutical intermediary service market, and the Japanese pharmaceutical intermediary service market not only provides professional services to related enterprises but also offers mutual data exchange services from drug tender procurement to purchasing for pharmaceutical companies. Drug prescription management will compile information and data from medical institutions and pharmaceutical companies.

c. Key factors for the maturity and development of foreign pharmaceutical sales

The maturity and development of pharmaceutical sales in foreign countries can be attributed to the following factors:

(1) Standardized technical standards and regulatory support

In the United States, the Food and Drug Administration (FDA) holds regulatory authority over online pharmacies based on the Online Pharmacy Consumer Protection Act. The Verified Internet Pharmacy Practice Sites (VIPPS) program established by the National Association of Boards of Pharmacy (NABP) ensures that only certified enterprises can sell prescription drugs online. The National Pharmacy Council manages the registration of online pharmacies and

more. In the UK, based on industry standards for online pharmaceutical sales published by the Royal Society, only online pharmacies are allowed to sell prescription and over-the-counter drugs. Similarly, the German government stipulates that only physical pharmacies can engage in online drug sales.

(2) Diverse payment options

In foreign online pharmacies, users can not only choose regular bank cards or third-party payment platforms for payment but can also use their social medical insurance or insurance company's medical insurance for payment. In Germany, patients can choose their own method to purchase medication after obtaining a prescription from a doctor, rather than going to a designated pharmacy. When a doctor writes a prescription, they prescribe based on the specific condition. Social insurance institutions or insurance companies can oversee the doctor's prescription when patients purchase medication, allowing patients to not only receive free medical care but also access better medical services.

(3) Diversification of operations and services

Comparing the development of pharmaceutical e-commerce in China and the United States, we can observe that the United States has a highly advanced pharmaceutical e-commerce system. Enterprises have widely established Management Information Systems, Enterprise Resource Planning Systems, Customer Relationship Management Systems for external relations, Supply Chain Management Systems, and Transportation Management Systems. The e-commerce transformation of enterprises is highly mature (Rao et al., 2011). Chinese pharmaceutical distribution companies should learn from the development experience of the United States, vigorously develop e-commerce in terms of transportation costs and logistics management and promote the efficient operation and rapid development of Chinese pharmaceutical distribution companies.

In the United States, online pharmacies not only offer the sales of prescription and over-the-counter drugs but also provide sales of medical equipment, beauty products, and health supplements. In the UK, in addition to drug transactions, pharmacies with online pharmacy designations can also provide electronic prescription services.

With the proliferation of domestic internet technology, pharmaceutical e-commerce in the United States and Japan has experienced rapid growth. Although the development of pharmaceutical e-commerce in China has been influenced by companies and the government since 2013, there still exists a certain gap compared to countries like the United States. In the research on the development of medical e-commerce in China, while there are numerous scientists, the research is relatively singular and lacks constructive suggestions, resulting in

limited momentum for the development of medical e-commerce in China. In the current “Internet+” environment, comprehensive and in-depth research on pharmaceutical e-commerce in China should be conducted and effective measures and recommendations should be proposed for its rapid development.

5) Pharmaceutical e-commerce market in China

With China’s aging population and the improvement of per capita living standards, the demand for medical care is growing in terms of both quantity and quality, which in turn drives the demand for pharmaceuticals (H. X. Feng et al., 2021). The rapid development of e-commerce in China has led various industries related to online commerce to enter our lives, reflecting the inevitable trend of modern internet industry development (Hu, 2020). China’s pharmaceutical e-commerce has experienced fluctuations driven by changes in government policies, but its visibility has been on the rise since 2013. After the implementation of the Internet Food and Drug Trading Supervision and Management Measures in 2014, against the backdrop of the trend of online sales of prescription drugs observed by the pharmaceutical capital market and related enterprises, the number of investments and financing in China’s pharmaceutical e-commerce has grown year by year (Y. T. Zhou, 2021).

In recent years, the government has been committed to reducing people’s expenditure on medical care and healthcare, addressing the imbalance of medical resources, and promoting appropriate reform policies. Measures have been taken to lower medical costs, including reducing the proportion of hospital medication, promoting prescription issuance in hospitals, controlling drug price growth, centralizing drug procurement, and controlling drug costs, which led to significant price drops for some prescription drugs in 2018. The pharmaceutical industry did not benefit from the healthcare reform, indicating that competition from retail pharmacies has become increasingly fierce (Y. T. Zhou, 2020).

This study will analyze the development process and existing issues of China’s pharmaceutical e-commerce in detail in the following sections.

6) Development and challenges of pharmaceutical e-commerce in China

China’s pharmaceutical e-commerce industry started later compared to foreign counterparts, but it quickly caught up and surpassed them leveraging the advantages of the Chinese internet era. As China’s e-commerce entered the 2.0 era, pharmaceutical e-commerce also entered a period of rapid development. After the State Council introduced the concept of “Internet Plus” in 2015, the development of pharmaceutical e-commerce was propelled by favorable policies. According to statistics from the National Medical Products Administration (NMPA), as of September 7, 2018, there were 13,955 internet pharmaceutical information

service companies, 991 internet pharmaceutical trading service companies, and 693 online pharmacies (M. Zhang & Lu, 2013).

In the B2C model, consumers' acceptance and recognition of online drug purchases have continuously improved, and they are gradually accustomed to the convenience brought by online pharmaceutical shopping. However, due to changing policy environments, imperfect business conditions and market for online drug sales, and incomplete laws and regulations, a series of challenges continue to arise for pharmaceutical e-commerce. Therefore, based on practical experience and guided by national policies, B2C pharmaceutical e-commerce platforms continue to grow and develop.

The development of pharmaceutical e-commerce in China can be roughly divided into five stages: the prohibition stage from 1998 to 1999, the pilot stage from 2000 to 2003, the nascent stage from 2004 to 2009, the growth stage from 2010 to 2015, and the high-speed development stage from 2016 to the present. Throughout these stages, there have been significant fluctuations in the policies governing the development of pharmaceutical e-commerce in China.

a. Prohibition phase (1998-1999)

China's first online pharmacy, Shanghai First Pharmacy, was established in 1998. However, a year later, in 1999, the National Medical Products Administration (NMPA) issued the "Interim Regulations for the Circulation of Prescription and Non-Prescription Drugs," which explicitly prohibited the online sale of prescription and non-prescription drugs. As a result, Shanghai First Pharmacy was forced to shut down (NMPA, 1999). This year can be considered as the exploration phase of pharmaceutical e-commerce in China.

b. Pilot phase (2000-2003)

On June 26, 2000, the Measures for Supervision and Administration of Drug E-commerce Pilot were introduced, allowing the online sale of non-prescription drugs on a trial basis in Beijing, Shanghai, Guangdong, and Fujian. This marked the official beginning of pharmaceutical e-commerce trials in China and a formal shift in regulatory approach from prohibition to limited opening.

c. Nascent stage (2004-2009)

On July 8, 2004, the NMPA issued the Measures for the Administration of Internet Drug Information Services, stating that enterprises holding the Certificate of Qualification for Internet Drug Information Services could provide paid drug information services to internet users (M. Zhang & Lu, 2013). This gradually opened up internet drug transactions at the policy level. A year later, on September 29, 2005, the NMPA further issued the Interim

Regulations for the Approval of Internet Drug Trading Services which specified that retail drug enterprises could sell non-prescription drugs online (C. X. Liu et al., 2018). This regulation conditionally opened up the application process for internet drug trading licenses for chain pharmacies, still limiting the sale of prescription drugs and requiring that online drugstores distribute drugs themselves rather than through third parties.

With these developments, the prohibition on online sales of prescription and non-prescription drugs from the Interim Regulations for the Circulation of Prescription and Non-Prescription Drugs gradually dissolved through new policies, providing legal space for the survival of pharmaceutical e-commerce companies. Seizing this historic opportunity, Jingwei Pharmacy became the first company to receive a domestic pharmaceutical e-commerce license, marking the beginning of the comprehensive initiation phase for China's pharmaceutical e-commerce. Following this, Pharmacy Online also became a legitimate online pharmacy in China. Subsequently, more pharmaceutical e-commerce companies entered the drug retail sector (S. W. Zhang, 2019).

d. Growth phase (2010-2015)

In 2012, Alibaba Group officially entered the pharmaceutical e-commerce field with the launch of Tmall Pharmacy, becoming a standard model for the platform-based operation of domestic pharmaceutical e-commerce and a benchmark for the development of other pharmaceutical e-commerce companies. By 2013, the number of online pharmacies in China had grown to hundreds, including the emergence of several large pharmaceutical e-commerce enterprises such as Jianke.com, 111.com.cn, and 7lkang.

On May 28, 2014, the NMPA officially released the Draft Measures for the Supervision and Administration of Internet Food and Drug Trading, which for the first time mentioned allowing internet companies to sell prescription drugs in accordance with the requirements of the Regulations for the Classification of Drugs. The draft also suggested permitting pharmaceutical e-commerce companies to entrust third-party logistics for drug distribution and lifting the prohibition on online sales of prescription drugs. Although this measure has not been officially released to date, the supportive policy signals it conveyed attracted a significant number of traditional pharmaceutical enterprises to enter the e-commerce field.

Unfortunately, in recent years, the number of online pharmacies has rapidly increased. Waves of investors have poured in, but very few have actually survived. Most companies have not yet found reliable, mature business models or unique development positions, and more participants hope to take shortcuts through simple replication. Wild growth is a true portrayal of many companies in the development stage of pharmaceutical e-commerce in

China (H. J. Wang et al., 2019).

In July 2015, China's State Council issued the Guiding Opinions on Actively Promoting the "Internet+" Action, proposing to encourage the development of pharmaceutical e-commerce and explore online sales of prescription drugs. It also aimed to establish a regulatory system for internet drug trading.

e. High-speed development stage (2016-present)

After previous brief explorations, full-scale production, and rapid growth, by 2016, the pattern of China's pharmaceutical e-commerce industry gradually emerged, with various major sectors represented by many representative enterprises. Based on past business models, the industry can be divided into three major categories: the B2B model represented by Jiuzhoutong and YSbang, the B2C model represented by Alibaba Health and JD Health, and the O2O model represented by Kuai Fang Song Yao and Ding Dang Kuai Yao. It is reported that by the end of 2017, the number of online pharmacies in China had reached nearly 700, and the entire pharmaceutical e-commerce industry had entered a period of comprehensive and rapid development (Deng & Zeng, 2019).

In February 2017, China's State Council officially proposed strengthening the guidance and regulation of "Internet + Drug Distribution," ensuring its steady and orderly development. It required the gradual integration of pharmaceutical e-commerce platforms and offline physical pharmacies, and the promotion of new drug distribution methods like online ordering and offline pickup. At the same time, the State Council proposed "implementing a comprehensive development guided by big data and gradually promoting Internet Plus in the medical field" as a key government focus for 2018. In April 2018, the General Office of the State Council issued the Opinions on Promoting the Development of "Internet + Healthcare." According to these opinions, practitioners can prescribe some common and chronic disease prescriptions online after obtaining patients' medical records. This legal basis and protection now provide a foundation for the sale of prescription drugs online.

In summary, China's current policies are highly favorable for the development of pharmaceutical e-commerce. From 2011 to 2018, the market size of pharmaceutical e-commerce in the B2C model increased from 400 million RMB to over 60 billion RMB, indicating that China's B2C pharmaceutical e-commerce has successfully transitioned from its initial slow development stage to a high-speed development stage (Yiou Net, 2018).

7) Composition of pharmaceutical e-commerce services

The pharmaceutical e-commerce service system provides support for the establishment and operation of the pharmaceutical e-commerce system by effectively integrating

pharmaceutical e-commerce resources. It consists of entities that perform specific functions, primarily including three parts: service supervisors, service providers, and service purchasers. Following the service delivery process as the main thread, pharmaceutical manufacturers offer drugs for sale on pharmaceutical e-commerce platforms, drug purchasers and distributors supply drugs to pharmaceutical e-commerce platforms, while drug transporters play a central role in the service system, responsible for the pharmaceutical logistics distribution between “pharmaceutical manufacturers–drug purchasers–pharmaceutical e-commerce platform–drug purchasers.” Pharmaceutical e-commerce platform operators are responsible for coordinating the production and sale of medical products, providing comprehensive services. Through the service delivery process of pharmaceutical products, a closed-loop ecosystem of “medicine + medicine + people” healthcare services is formed, connecting upstream pharmaceutical manufacturers/suppliers with downstream purchasers, transferring offline drugs and services to online service platforms, and integrating pharmaceutical production, distribution, payment, and consumption phases. Government departments play a significant role in driving the ecological development of the pharmaceutical distribution service industry. The entire process of pharmaceutical distribution is supervised by relevant health administrative departments, ensuring the smooth operation of pharmaceutical e-commerce services (X. Y. He et al., 2021).

8) Analysis of the business characteristics of pharmaceutical e-commerce

Given the unique attributes of pharmaceutical products and consumers, pharmaceutical e-commerce exhibits the following characteristics:

a. Excessive standardization of goods

Standardization of goods is conducive to unified sales strategies and increased consumer acceptance and recognition. However, pharmaceutical products differ from standardized goods in other retail industries. Due to strict national regulations throughout the entire pharmaceutical supply chain, pharmaceutical products have a high degree of homogeneity. Apart from price variations, pharmaceutical companies lack unique core competencies to differentiate themselves. Moreover, the stringent entry requirements for pharmaceutical products and the limited choice in selecting supply chain sources for well-known drugs hinder pharmaceutical e-commerce platforms from establishing their own sustainable competitive advantages beyond price subsidies.

b. Non-standardized service models

In contrast to the excessive standardization of pharmaceutical products, the service models in the pharmaceutical industry are often non-standardized. Medical diagnoses and treatments involve complex processes that require personalized judgments. Consequently,

standardizing operations for offline pharmaceutical retail services differs significantly from other large-scale retail sectors. Services that cannot be standardized cannot be easily replicated in a straightforward commercial manner. Therefore, if platform companies aim to serve a broader customer base, their service costs may not follow the marginal cost reduction trend seen in the internet industry's economies of scale.

c. Limitations of online sales

China's policies and regulations governing online pharmaceutical retail have been constantly changing, and the regulatory flexibility and innovativeness seen in other industries' online sales are not achievable in pharmaceuticals. When selling pharmaceuticals online, China's pharmaceutical regulatory authorities have established numerous requirements and restrictions, affecting drug category selection and prescription record management alike (S. H. Zhu, 2017).

d. Stringent logistics distribution

The distribution characteristics of pharmaceuticals necessitate complex logistical processes between the initial supply side and the final sales terminal, filling the temporal and spatial gap between the two. Third-party pharmaceutical logistics separate logistics activities from drug production and operation (Yu, 2012).

Pharmaceutical logistics differ from general logistics distribution; they involve the storage, transportation, warehousing, and distribution of pharmaceuticals and are closely related to drug quality and safety. Consequently, third-party logistics enterprises engaged in pharmaceutical logistics distribution must adhere to stringent controls, leading to stricter qualification requirements for pharmaceutical logistics third-party distribution compared to general retail logistics distribution (M. Q. Zhang et al., 2019).

9) Key issues in pharmaceutical e-commerce

In China, the online sales of pharmaceutical products are predominantly B2B, accounting for over 80% of the entire pharmaceutical e-commerce, while B2C sales for individual users represent only about 15% (Y. T. Zhou, 2020). Meanwhile, the sales revenue of China's online pharmacies constitutes merely 2% of the entire pharmaceutical market. Consequently, there remains significant room for development in China's online pharmaceutical sales. However, several factors impede the growth of online pharmacies:

a. Inadequate and defective relevant laws, regulations, and policies

The policy environment is crucial for the development of pharmaceutical e-commerce. To promote the healthy and orderly development of pharmaceutical e-commerce services, the administrative supervisory departments responsible for pharmaceutical e-commerce services

in China have promoted the construction and expansion of the pharmaceutical e-commerce service system. Starting from 2000 when online sales of prescription and non-prescription drugs were prohibited, to 2005 when only non-prescription drugs were allowed to be traded online (Guo et al., 2005), and up to 2015 when the development of pharmaceutical e-commerce was explicitly promoted (State Council, 2015, 2018). However, in 2016, third-party platform drug online retail pilots were halted comprehensively (Xinhua News Agency, 2016).

Subsequently, in January 2017, qualifications for Internet trading services (Certificates A, B, and C) were cancelled, and in September, Certificate A for Internet trading was revoked, leading to the complete lifting of restrictions on pharmaceutical e-commerce. Starting from 2018, online prescriptions for common and chronic diseases were suggested. After pharmacist review, medical institutions and pharmaceutical businesses can entrust qualified third-party organizations for distribution (State Council, 2018).

The policies and regulations related to pharmaceutical e-commerce services in China have experienced twists and turns in response to market developments (H. J. Wang et al., 2019). The current trend in pharmaceutical e-commerce policies is gradually becoming clear, yet existing legal norms suffer from legislative thinness, lower legal effectiveness, unclear legal relationships, missing behavioral norm systems, and vague legal obligations (H. J. Wang et al., 2019), making it difficult to optimize the allocation of pharmaceutical e-commerce service resources.

Although policies have stipulated qualification criteria for online pharmacies, the enforceability of penalties for violations is weak, leading to a mixed sentiment in the online drug market and the proliferation of counterfeit pharmacies. Additionally, the explicit prohibition of online sales of prescription drugs has prevented the further expansion of the market scale (Z. C. Ma & Xu, 2018).

b. Constraints in the pharmaceutical distribution system

The issue of online sales of prescription drugs has consistently been subject to strict regulatory policies. Over the years, the country has undergone various reforms and explorations in medical and pharmaceutical separation and healthcare reform. However, the inherent prescription drug distribution system remains primarily within hospitals, limiting its flow to the end market. For instance, medical insurance policies regarding online pharmacies by the medical insurance department are still not fully opened. Combined with the restrictions of various drug safety regulations, this has impacted the operational costs and development scale of pharmaceutical e-commerce.

In 2014, the NMPA issued the Internet Food and Drug Operation Supervision and Management Measures (Draft for Comments), allowing distributors to sell prescription drugs based on prescriptions. Although this design aimed to break the deadlock in the online sales of prescription drugs, ensuring the accuracy of prescriptions poses another challenge, including issues of prescription authenticity, expiration dates, and pharmacy verification. How to make prescription distribution a major challenge for the future of pharmaceutical e-commerce (Q. Li et al., 2020).

c. Lack of Medical Insurance for Online Pharmacies

After setting up pharmacies or hospitals, most patients opt for social medical insurance payments. However, social medical insurance does not support online payments, deterring many users. Enabling online payments for social medical insurance would provide an opportunity for the development of online pharmacies. While several factors limit the development of pharmaceutical e-commerce, progress has been made in the pharmaceutical sector.

On one hand, medical and pharmaceutical separation and prescription distribution are directions that China's healthcare reform efforts are striving towards. On the other hand, the online payment function of medical insurance cards has been an ongoing topic of study in China. The implementation of the online payment function for the Haining Medical Insurance Card in 2015 signifies potential future support for online payments with nationwide medical insurance cards.

In China, the development of pharmaceutical websites is relatively mature, with large chain pharmacies having their own online drug sales platforms, such as Qi Le Kang Online Pharmacy and Jianke.com Online Pharmacy. Additionally, medical platforms like 1haodian Pharmacy and JD Pharmacy also have well-established drug sales platforms. However, there are no relatively mature and forward-looking pharmaceutical application products in the domestic market, including the sales of prescription drugs and support for medical insurance funds. Nevertheless, currently, provinces and cities across the country have successively opened up medical insurance reimbursement for internet healthcare, and the opening of medical insurance payments for online pharmacies is undoubtedly an imminent prospect.

d. Incomplete "Medical + Pharmaceuticals" Healthcare Service Ecosystem

Supported by internet technology platforms, pharmaceutical e-commerce services involve interactions among numerous participants, including administrative supervisory departments, medical institutions, pharmaceutical suppliers, pharmaceutical logistics distributors, financial institutions, end consumers, and more (Hou & Yang, 2019). Currently, the relatively mature

medical e-commerce service model primarily revolves around online drug sales services. This model utilizes internet information technology to construct service platforms that offer pharmaceutical trading services for suppliers, distributors, retailers, and individual users. While this model provides a relatively singular service form, it lacks sufficient industry connectivity and participant interactions, failing to form a closed-loop ecosystem for “medical + pharmaceuticals” healthcare services (Y. Zhao, 2015).

e. Insufficient Investment

The establishment and improvement of the medical e-commerce service system and the development of related medical services require robust financial support. Currently, funds for the construction of the medical e-commerce service system primarily come from the development funds of medical e-commerce enterprises. There is a lack of government investment and participation from other organizations. The funding channels to support the development of the medical e-commerce service system are relatively limited. Moreover, with the decline in domestic economic growth and the increasing caution of financial institutions, e-commerce enterprises may find it even more challenging to secure development funds.

f. Need for Improving Talent Development

The talent shortage has consistently been a bottleneck for the development of medical e-commerce services. As the medical e-commerce market becomes more regulated and competitive methods continue to evolve, the shortage of specialized talents will become more pronounced. The resources and experiences accumulated by existing medical talent teams based on traditional business models are insufficient to substantially drive the development of medical e-commerce services (T. Sun & Xie, 2017). Operational and management talents in medical e-commerce services not only need to possess e-commerce expertise but also require a strong foundation in medical knowledge and familiarity with the operational and management rules of medical e-commerce. Currently, in the field of medical e-commerce, individuals who possess a blend of skills in “computer technology,” “medical knowledge,” and “business management” are extremely scarce.

g. Changing Consumer Habits to Reflect Differences in Consumer Characteristics

Young people constitute a significant proportion of consumers who purchase medicines online, as they are more accustomed to online shopping. Most middle-aged and elderly individuals are relatively unfamiliar with online shopping and often find it challenging to operate smart devices. Consequently, this group of consumers tends to prefer purchasing the required medications from physical pharmacies or hospitals.

In conclusion, although China’s pharmaceutical e-commerce has experienced rapid

development in the current stage, it still faces numerous challenges that cannot be ignored. Gaining an in-depth understanding of the characteristics and features of pharmaceutical e-commerce, and making targeted improvements in operations and services to enhance customer satisfaction, is one direction to enhance operational efficiency and subsequently increase enterprise profits.

2.1.2 Definition and related concepts of customers and customer satisfaction

Customer satisfaction theory is a product of the continuous development of company management and marketing concepts. The concept of customer satisfaction theory was initially introduced in the 1960s, but scholarly research and practical studies began around 1965 (Cardozo, 1965).

Foreign scholars define customer satisfaction around two main components: customer perceptions and customer expectations. These refer to the customer's perception of the purchased product or service and their expectations regarding the product or service. Generally, most scholars study customer satisfaction around the "expectation-difference" model, where comparisons and judgments can be made against the reference point of customer expectations (Y. Feng, 2016). Additionally, various other theories and models exist that also significantly impact the development of customer satisfaction theory.

1) Definition of Customers

Customers are individuals or entities that purchase goods or services from stores or service enterprises, including social organizations, companies, or individuals (Sui, 2008). Relative to suppliers, customers are a corresponding concept. However, the interpretation of this concept varies widely across different literature. From a temporal perspective, the definition of customers can be categorized into three types:

Past Customers: Individuals or entities that previously used or purchased products and services but no longer do so. These are customers that the business once had but is now purchasing goods and services from other platforms for various reasons. With appropriate measures, this segment of customers can potentially be redeveloped into potential customers.

Current Customers: Current customers are those who are currently using or receiving the business's products or services. They either favor the current products and services or, while dissatisfied, may become loyal customers through targeted solutions. This type of customer is the most crucial for the business to maintain.

Future Customers: These customers have not yet made purchases from the business but

have the potential and ability to do so. They are the target customers of the business. By maintaining a positive image and strengthening marketing efforts, businesses can attract these potential customers.

Based on their location, customers can be divided into two categories.

Internal Customers: These are individuals or social groups within the enterprise who receive services or use products. This mainly applies to mutual service between employees within the enterprise (L. Liu, 2010). This category is not the focus of this study.

External Customers: These are individuals or groups outside the enterprise who receive services or use products. It mainly refers to customers external to the organization (L. Liu, 2010). This category falls within the scope of “customers” in this study.

Due to the limited scope of customer satisfaction assessment in this study, which is restricted to the consumer goods sector, the surveyed customers only include external individuals who have participated or are currently participating in consumption. Non-individual services are not included. This definition emphasizes that customers must have received products or services at least once (Luo, 2006). Within this premise, this study conducts a satisfaction assessment of customer consumption behavior.

2) Customer Relationship Stages in Firms

For businesses, the market serves as both the starting point and endpoint of marketing activities. The relationship between the enterprise and its customers has always been a focal point of marketing. The behavior of the enterprise-customer relationship can often be depicted using the customer lifecycle, which can be illustrated by the following Figure 2.1 (W. Yang, 2015).

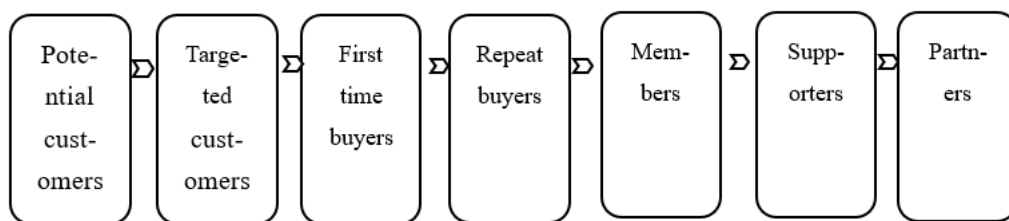


Figure 2.1 Customer life cycle

3) Definition of Customer Satisfaction

The concept of customer satisfaction emerged in Europe and gained popularity in the 1960s. Cardozo (1965) introduced the concept of customer satisfaction into new marketing contexts. Subsequent research has delved into defining customer satisfaction, understanding its implications, identifying evaluation indicators and assessment methods, and analyzing various factors that influence it (Y. Tian, 2016). Despite extensive research and exploration of

the concept of customer satisfaction from various angles, there is no unified and exact definition. Based on the summaries of numerous scholars, the concept of customer satisfaction can generally be defined in two ways:

Firstly, cognitive state or evaluation results. Some scholars view customer satisfaction as a cognitive state or evaluation result. For instance, in the late 1960s, Howard and Sheth (1969) characterized consumer satisfaction as a cognitive state resulting from appropriate or inappropriate compensations for sacrifices made by the buyer. Hunt (1977) suggested that customer satisfaction is an evaluation based on experience, resulting from the entirety of the consumer's process of buying goods or services. Tse and Wilton (1988) defined customer satisfaction as the differential evaluation customers make of a product, indicating the evaluation of the difference between expected and quality perception before and after purchase.

Secondly, Emotional state. Some scholars lean toward viewing customer satisfaction as an emotional state. For instance, in a 1981 paper, Oliver and Linda (1981) defined customer satisfaction as a psychological, emotional state that occurs when a customer's value-expectations formed through their consumption experiences align with others' consumption experiences. Westbrook and Reilly (1983) proposed that customer satisfaction is a psychological, emotional response to the presentation of products and the overall shopping environment during the purchase process.

Kotler and Armstrong (1994), an authoritative figure in marketing, regarded customer satisfaction as the pleasant or disappointing emotional feeling and psychological state that naturally emerges when customers compare the different perceived effects (or outcomes) of distinct attributes of a particular product. They expressed satisfaction as a function of the difference between perceived effects and expected values. When a buyer's actual perceived effects fall far short of their expectations, dissatisfaction arises; when the perceived effects match the expectations, satisfaction occurs; and when the actual perceived effects exceed expectations, extreme satisfaction is felt.

Through literature review and retrospective analysis, it can be observed that the definition of customer satisfaction has been mainly focused on the following two directions:

a. Definition from the perspective of consumer states: Customer satisfaction is a post-experience evaluation of customers towards purchasing services and receiving services. It is a resultant experience arising from consumption experiences and encounters. This includes definitions by Oliver (1980) and Kumar et al. (2000).

b. Definition from the perspective of process evaluation: Customer satisfaction is the

evaluation of consumer behavior after the consumption experience.

4) Basic Characteristics of Customer Satisfaction

It is generally believed that customer satisfaction possesses the following fundamental characteristics (Hua, 2017):

Subjectivity: Customer satisfaction is subjectively expressed by customers, based on their experiences with product or service usage. Although the objects of their perception are objectively existent, the conclusions drawn are subjective. Customer experiences, knowledge, income levels, daily habits, values, and other factors are all associated with customer satisfaction.

Hierarchy: Maslow proposed that human needs can be divided into five dimensions, and individuals have different evaluation criteria for products and services across these different need dimensions. Due to variations in customer requirements among different regions and social strata, or even within the same individual under different conditions, evaluations of a product or service may vary. This requires us to provide services that cater to customer needs in a hierarchical manner.

Relativity: Customers often tend to compare the technical specifications, costs, and other indicators of the products they intend to purchase with those of similar products or with their previous consumption experiences. The satisfaction or dissatisfaction evaluations derived from such comparisons exhibit relativity.

When evaluating customer satisfaction, it is necessary to consider these fundamental characteristics of customer satisfaction and assess customer satisfaction factors from various dimensions.

5) Distinction between Customer Satisfaction and Customer Satisfaction Index

The concepts of customer satisfaction and customer satisfaction index differ from each other. Customer satisfaction is viewed from a static observational perspective, while the customer satisfaction index involves dynamic comparisons. Generally, customer satisfaction is regarded as a static observation at each stage and time point. It represents the average satisfaction of all surveyed subjects at a specific stage and time point towards the surveyed company.

On the other hand, the customer satisfaction index primarily reflects how customer satisfaction changes over time. If researchers are interested in assessing the satisfaction that customers receive from a product or service at a specific point in time, the method used would involve measuring customer satisfaction. If a detailed examination of the relative changes in individual customer satisfaction is required, it is necessary to conduct at least two consecutive

surveys on the same product or service. This is referred to as the customer satisfaction index, which emphasizes the relative changes in average satisfaction rates over a period of time (W. Z. Zhou, 2011).

2.1.3 Customer satisfaction theories

1) Current state of foreign research on customer satisfaction theories

The study of customer satisfaction theories began as early as 1965 when scholars in the United States delved into the concepts of customer satisfaction and dissatisfaction. This is widely considered to be one of the earliest theoretical research endeavors in this field, primarily undertaken from the perspective of consumer psychology (Cardozo, 1965).

Hunt's (1977) proposed that customer satisfaction with a service is assessed through a cognitive evaluation of whether a customer's expectations have been met. If a customer perceives that the outcome meets or exceeds expectations, their evaluation is one of relative satisfaction; otherwise, they are dissatisfied.

Subsequently, with the ongoing development of relevant theories and empirical research, many countries and regions such as Sweden, the United States, Turkey, and the European Union have established government customer satisfaction index models based on their own economic characteristics and satisfaction theories (Anderson & Fornell, 2000; Fornell, 1992).

In this century, as research on customer satisfaction has deepened, researchers have explored the connections between customer satisfaction, customer value, and customer expectations (L. Zheng, 2008; Y. Tian, 2016). Those who hold this viewpoint argue that a customer's judgment of satisfaction with a product or service is based on the level of expectation they established before purchasing the product or availing the service. Customer satisfaction with a product is a mental state influenced by the entire process and environment of consumption.

Some studies suggest that consumer satisfaction is an evaluation of the differences between obtaining a product and the consumption experience. Essentially, it is a generalized psychological state originating from emotional responses to unmet expectations and the feelings generated from previous consumption experiences. These researchers believe that customer satisfaction is a psychological emotional state that arises when a customer's expectations, formed based on past consumption experiences, align with the actual consumption scenario (Oliver & Linda, 1981).

Bearden and Teel (1983) stated that customer satisfaction refers to the satisfied or

dissatisfied attitude formed by customers after comparing their purchase experience with their expectations for a product or service. Some studies propose that customer satisfaction is the evaluation of the differences between customers' expectations when purchasing a product and their actual perceived experience after consumption. If the perceived experience greatly exceeds the expected experience, customers will feel satisfied; however, the larger the negative difference, the less satisfied they will feel. Kotler and Armstrong (1994) defined customer satisfaction as a feeling of pleasure or disappointment resulting from comparing a product's or service's actual performance in relation to expectations.

With the rise of the internet industry, a series of specialized studies on e-commerce and online shopping platforms have emerged (Luo, 2006). Some scholars consider online customer satisfaction as a holistic concept and approach it within an overarching framework. They believe that factors such as not only product prices, sales, and services, but also front-end services and other services provided by websites, post-sales and services of companies, directly influence both consumers and online customer satisfaction. Furthermore, these factors directly determine consumers' repurchase rates in the realm of the internet and online shopping. Based on this, a model for evaluating customer satisfaction in e-commerce has been proposed (Lee, 1999).

Certain researchers have explicitly proposed a connection between the importance of measuring online shopping and its user satisfaction. They have established evaluation indicators, taking into consideration the quality and speed of service related to product information, the entertainment and reliability of the internet, convenience, and other factors. This forms the basis for an evaluation index system for the importance of online shopping and customer satisfaction (Kim & Lim, 2001; Ni, 2015).

Parasuraman et al's (2005) team found that the security and reliability of a website significantly impact customer experience. They specify that reliability refers to the accuracy of delivering goods and services by an e-commerce enterprise, as well as the alignment of delivery time with stipulated deadlines (Wolfenbarger & Gilly, 2003). They also affirm that service reliability significantly influences customer satisfaction and loyalty.

The reliability of service significantly impacts customer satisfaction and loyalty. Some scholars propose that the factor of "information" plays a crucial role in influencing the customer's online shopping process. The accuracy of information obtained from shopping websites or businesses, and its value during the current online shopping process, determine whether the customer's entire shopping experience can proceed smoothly (Y. Tian, 2016).

For influencing the smooth progress of online product transactions, the quality of

obtained information is, to a certain extent, an essential indicator of customer satisfaction with businesses and online shopping websites (VanScoyoc, 2000).

Regarding the various services generated in online shopping, research based on the SERVQUAL system has explored an indicator system for evaluating the quality of satisfaction with online shopping services. This system primarily includes aspects like tangibility, specificity, security, reliability of services, as well as aspects related to the purchasing process and responsiveness (Long & McMellon, 2004). Regarding the positive correlation between customer loyalty and customer satisfaction, research results indicate a strong positive relationship between the two (Santouridis & Trivellas, 2010).

Some studies have built a multi-level evaluation model for e-commerce platforms based on the grey system theory. This evaluation system assesses customer satisfaction of the platform's customers and identifies the primary influencing factors. By analyzing the evaluation results, guidance for improving the platform is provided (F. B. He et al., 2013). Pilík (2013) analyzed the online shopping behavior of 1000 online customers and investigated factors influencing their shopping choices, such as service quality, security, and service expectations. The research indicated that these aspects significantly impact improving customer satisfaction.

Moreover, some studies empirically tested the impact of B2C website quality on online shopping value and subsequent customer repurchase intentions. They asserted that websites are key factors determining e-commerce survival, competitive advantages, and success. The results revealed that customer trust, utilitarian shopping value, and customer satisfaction are direct factors influencing the willingness to repurchase products (Homsud & Chaveesuk, 2014).

In the realm of internet e-commerce, a research team conducted investigations among 304 internet platforms' customers. They used traditional marketing theories and ideas of information management to deeply study the improved convenience and service quality brought about by internet e-commerce for customers. A new management grid system was established to enhance service quality and product convenience, thus enhancing customer satisfaction (Lai et al., 2014).

Research has determined factors that influence customer satisfaction and loyalty in online shopping. With this, a precise segmentation of customer satisfaction and loyalty can be achieved for online customers. These research results are useful for practical application in the field of online marketing (Masínová & Svandová, 2014).

Additionally, research argues that information quality and online service quality of e-

commerce websites are key factors directly affecting user satisfaction and the sustainable development of the e-commerce industry. Operators of e-commerce websites can enhance their competitiveness by improving these two indicators (Sharma & Lijuan, 2015).

2) Current state of studies in China

Starting from 1995, with Professor Zhao Ping from Tsinghua University formally introducing the concept of customer satisfaction to China, many domestic scholars gradually began systematic research and analysis of customer satisfaction (Qing, 2003). Since 1998, experts in China have introduced theories of customer satisfaction evaluation and conducted a series of practical works, including constructing indicator system models and evaluating service quality. In 1999, the founder of the Customer Satisfaction Index model, Fornell, was invited to China for exchange and research on customer satisfaction. Before that, researchers in China had not conducted quantitative research on customer satisfaction and mostly remained at a qualitative level. In comparison with foreign research, China's research on customer satisfaction started later and developed at a slower pace, especially lacking systematic and comprehensive customer satisfaction studies tailored to specific industries and directions. However, as China's corporate management philosophy and service awareness improved and the rise of domestic e-commerce platform enterprises occurred, research on customer satisfaction in various industries in China has been gaining increasing attention.

Scholars at different stages have researched customer satisfaction from various perspectives (Y. Feng, 2016). Based on their understanding of the concept of customer satisfaction, X. C. Wang et al. (2003) believe that customer satisfaction is the result of the direct or indirect interaction between customer expectations, customer needs, meeting expectations, meeting needs, and customer perceptions. They further propose the Demand-Expectation model. Moreover, they assert that customer satisfaction is an important prerequisite for achieving customer loyalty, and achieving customer satisfaction is what promotes customer loyalty.

Regarding factors influencing prices, researchers, after analyzing in-depth the main influencing factors of customer satisfaction with prices among different samples, have studied the tolerance level for prices among different samples (such as different ages, cultural backgrounds). Further research results indicate a positive correlation between the tolerance level for prices and customer satisfaction (Guo et al., 2005).

Researchers comprehensively analyze the main factors influencing customer satisfaction from aspects like hardware equipment, service processes, and service remedies. They then calculate the weights of various main influencing factors using traditional factor analysis

methods, identifying business processing speed and service attitude as major factors affecting customer satisfaction in the banking industry (Bai, 2013).

In terms of customer satisfaction and loyalty research, different customers and industries have varying understandings of satisfaction, leading to different customer behaviors. Enterprises should classify customer complaints and adopt different handling measures for different types of complaints to transform complaints into loyalty, thereby increasing customer satisfaction and loyalty (Shen, 2005).

H. Ma (2007) argued that customer loyalty to a company is greatly influenced by customer satisfaction with the company. The degree of customer loyalty to a company is positively correlated with other factors. Additionally, besides the product or service itself, the attractiveness of substitute products or services can also affect customer satisfaction, subsequently influencing customer loyalty.

In the field of customer satisfaction research in internet e-commerce, a significant amount of research has been conducted in China. Duo et al. (2003) proposed a customer satisfaction evaluation system based on Analytic Hierarchy Process (AHP) and fuzzy methods to meet the needs of enterprises in the e-commerce environment.

H. H. Zhou (2008) analyzed the results of data processing using the Kano model. Based on his survey of online shopping service quality, he preliminarily identified three important quality influencing factors in the development of e-commerce: basic quality, expected service quality, and attractive quality. He also analyzed potential issues in China's e-commerce development environment and proposed corresponding research recommendations.

Using the "Quality-Satisfaction Chain" theoretical framework, J. Liu and Yu (2010) designed and constructed the main quality influencing evaluation factors for overall customer satisfaction in enterprise e-commerce through systematic research. The main factors included several basic characteristics of enterprise websites (or trading platforms), such as logistics distribution, network security, online store operations, effective communication between service providers and information, perception of price chain, and after-sales service. They further developed a model for overall customer satisfaction in enterprise e-commerce based on this research.

Considering customer needs, D. L. Xu and Wang (2010) divided business customer groups into four different types. By analyzing various consumption behavior characteristics of these online customers during their online shopping processes, he identified reasons and patterns and derived that products, websites, and after-sales services are the three major aspects influencing customer satisfaction in B2C e-commerce. He subdivided the process of

online shopping into five categories of indicators and 19 main influencing factors based on various different consumer behaviors and motivations that directly or indirectly affect these online customers.

D. R. Zhu (2013), based on the strengths and characteristics of some large-scale e-commerce leading enterprises in China, used customer satisfaction theory and technical guidance to establish assessment and evaluation indicators for customer service quality and satisfaction in e-commerce leading enterprises. They accurately determined the weights of assessment and evaluation indicators at various levels by comprehensively applying multi-dimensional and hierarchical analysis methods and conducted numerous case studies.

By applying AHP and Grey System Theory (primarily used for studying uncertain factors in system models, analyzing relationships between systems, building models, and making decisions (Bindu et al., 2010), P. Huang et al. (2014) summarized several comprehensive evaluation indicators as two basic evaluation indicators: supplier evaluation model and consumer evaluation model. They ultimately integrated these two evaluation models into a comprehensive evaluation model for an e-commerce platform.

Scholars collected data from experienced online shoppers to validate their theoretical research models, significantly enriching their understanding of B2C website success. They pointed out that the causal sequence of quality, risk, and value can strongly influence customer satisfaction and loyalty (Lin & Wang, 2015).

Yuan (2015), drawing from customer satisfaction theory, explored strategies for improving customer satisfaction with products in the context of China's online consumption product industry and its related factors affecting consumers' purchased goods within the internet shopping environment.

X. Tian et al. (2015) analyzed the strategies for enhancing customer satisfaction and loyalty of YHD (an online retailer in China) from the perspective of customer relationship management. They provided suggestions on handling customer complaints.

In the evaluation of customer satisfaction index in 2000, Y. Q. Wang and Yan (2000) proposed the concepts of Customer Satisfaction Index and Customer Satisfaction Grade. The method of analyzing data using questionnaire surveys, market analysis is also known as quantitative analysis method.

G. Li (2001) applied fuzzy theory and Deterministic Finite Automaton methods to examine customer satisfaction, and the conclusions drawn by customers only need to be a direct fuzzy impression.

Song and Li (2002) proposed a quantitative improved evaluation method. They greatly

improved the accuracy and precision of expert evaluation by using the Kalman filter method to adjust expert ratings based on customer satisfaction survey data, and accurately calculated weights using this part of the evaluation data.

In 2005, the China Customer Satisfaction Evaluation Center of the China National Institute of Standardization was officially established. The research results included a measurement model for the Chinese Customer Satisfaction Index, which is internationally advanced and suitable for the Chinese context (L. C. Ma, 2013; L. Zheng, 2008).

2.1.4 Customer satisfaction evaluation models

1) Relevant theories in customer satisfaction evaluation

a. Expectancy Disconfirmation Theory

The concept of Expectancy Disconfirmation Theory was initially introduced by Oliver (1980). According to this theory, customers form expectations about a product before purchasing it. During or after the consumption process, customers evaluate the product based on their expectations. If the product meets their prior expectations, customers are generally satisfied. If the product's performance falls below expectations, customers might be dissatisfied, and if the product exceeds expectations, customers could be highly satisfied. This theory can be expressed as: $\text{Satisfaction} = \text{Actual Performance of the Product} - \text{Prior Expectations}$.

Meanwhile, some scholars challenged the Expectancy Disconfirmation Theory from a different angle, suggesting that customers' perceptions directly and strongly determine service quality and customer satisfaction (J. Liu et al., 2004). For instance, even if customers have low expectations for a product due to a lack of alternatives in the market, purchasing the product does not lead to genuine satisfaction if its actual performance is poor, even if it slightly exceeds the low expectations (Y. Tian, 2016).

b. Kano model

Japanese scholar Kano (1984) extended the dual-factor theory to a two-dimensional model of quality recognition and understanding. He believed that product quality is influenced by both customers' subjective perceptions and the objective performance of products/services. He thus introduced the renowned Kano Model.

Based on the relationship between quality attributes of products/services and customer satisfaction for different types of goods and services, these attributes can be roughly categorized into five types (D. Xu, 2010):

(1) Linear quality attributes: Linear quality attributes are linearly correlated with customer satisfaction. Good performance leads to satisfaction, while poor performance leads to dissatisfaction. These attributes correspond to customers' quality expectations.

(2) Basic quality attributes: Certain quality attributes are considered basic to a product or service. Good performance in these attributes does not significantly increase customer satisfaction, as customers consider them as essential and are dissatisfied when performance is poor.

(3) Excitement quality attributes: These attributes can be described as surprising or delightful characteristics of a product or service. Good performance leads to customer satisfaction, while poor performance leads to dissatisfaction.

(4) Indifferent quality attributes: These attributes are ones that customers do not particularly care about or are not interested in whether they are provided.

(5) Reverse quality attributes: If a quality attribute in a product or service is disliked by customers, it leads to strong dissatisfaction. Having these attributes can significantly lower customer satisfaction.

The Kano Model, being a typical qualitative analysis model, is generally not directly applied to measure customer satisfaction. When several features are closely related or situated at the two extremes, it becomes difficult to convert their importance levels. Both the Kano Model and the two-dimensional model might not always provide clear classifications for the importance of performance attributes. Research has shown that the significance of quality attributes varies with the products and services involved. Spending excessive time monitoring the importance of quality attributes can lead to other issues (Wei, 2006).

As a result, the Kano Model is often used for classifying performance indicators, aiming to help companies understand and grasp customer needs at different stages and levels, and identify the main factors that lead to customer satisfaction.

c. Service Quality Gap Model

Based on the Expectation-Perception Theory, American experts and scholars introduced customer satisfaction into the framework of this theory, focusing on the relationships between customer satisfaction, service quality, and customer expectations. They proposed the Service Quality Gap Model, which consists of five gaps that impact customer satisfaction and explored the reasons for customer dissatisfaction (Parasuraman et al., 1985).

The customer satisfaction function used in the research is defined as: $GAP5 = f(GAP1, GAP2, GAP3, GAP4)$, where:

GAP1: Analyzes the perceptual gap between customer expectations and managerial

understanding. When managers fail to fully comprehend customer expectations, they are unable to provide satisfying services.

GAP2: Refers to the gap between managerial perceptions of customer expectations and service quality standards. Limitations due to resources and market conditions might prevent standardized services, resulting in a gap in service quality management.

GAP3: Represents the gap between service quality standards and the actual service delivery process. When service quality falls short of standardization, it directly impacts how customers perceive the quality of the service.

GAP4: Reflects the gap between service delivery and external communication. This can involve exaggerated advertising that raises customer expectations. When actual service falls short of these expectations, it decreases customers' perception of service quality.

GAP5: Signifies the gap between customer service expectations and their perception of the delivered service. This gap is related to customers' perceptual differences after receiving the service and determines their level of satisfaction.

The SERVQUAL measurement method primarily evaluates customer service expectations and perceptions separately and then calculates the difference between the two. A higher score indicates a greater distance between customers' perceived service experience and their service expectations, implying lower perceived service quality. The Service Quality Gap Model accurately identifies the root causes of product quality issues, enabling targeted improvements and the formulation of appropriate development strategies. The SERVQUAL assessment method better understands perceived service quality, tracks changes in service quality trends, and provides comprehensive measurements of service quality.

d. Customer delivered value theory.

In 1994, Kotler introduced the Customer Delivered Value theory, which suggests that Customer Delivered Value is the difference between Total Customer Value and Total Customer Cost. Customer satisfaction is determined by the total value customers receive compared to the total cost they pay (Bu, 2009; Kotler & Armstrong, 1994).

The Customer Delivered Value theory offers a qualitative measurement of customer satisfaction from the customer's perspective, while it also has limitations. Firstly, the theory focuses on understanding the combination of factors that influence customer purchase decisions and their mechanisms, reflecting customer satisfaction through value perception, but it overlooks customers' perceptions of product or service quality. This makes it challenging for the customer satisfaction obtained under this theory to have specific indicators. Secondly, scholars argue that this theory to some extent neglects the symbiotic relationship between the

main body and the object of marketing activities (Ding, 2009).

e. Quadrant model

The Quadrant model is a combination of quantitative and qualitative research, with a focus on qualitative assessment of customer satisfaction. It is also known as the important factors deduction model.

In the Quadrant model, the first step involves listing all the performance indicators of the products or services of the evaluated company. Each performance indicator possesses two basic attributes: importance to customers and satisfaction. Ratings are assigned to the impact of each performance indicator on customer importance and satisfaction. Based on these ratings, the factors influencing customer satisfaction are categorized into four quadrants. Companies can then address these influencing factors individually to obtain an overall customer satisfaction value for their products or services (L. Wu & Zhai, 2012).

The Quadrant model is widely used in China for customer satisfaction assessment. Most companies use this model when conducting customer satisfaction surveys. The model is simple, straightforward, convenient, and effective, requiring minimal mathematical tools and techniques. It is easy to grasp and apply in terms of design, survey, and data analysis. However, this model also has limitations. The main reason is that each indicator in the questionnaire needs to be evaluated for both satisfaction and importance, leading to longer questionnaires. This may cause visual and psychological fatigue among respondents, making it difficult to assess the reliability and objective accuracy of their evaluations.

Additionally, this analytical method isolatedly examines satisfaction, not fully considering the direct impact of customer perceptions and expectations on customer satisfaction. Furthermore, since this model employs specific performance indicators, it is challenging to compare customer satisfaction across different industries in practical applications.

2) Customer satisfaction index models

The Customer Satisfaction Index is a quantified variable that reflects customer subjective evaluations and behavioral tendencies. It encompasses various factors such as customer expectations, quality perception, value perception, customer complaints, customer loyalty. Statistical analysis using econometric models is employed to derive customer satisfaction indicators (X. Wu, 2002).

a. Swedish Customer Satisfaction Barometer (SCSB)

In 1989, Sweden pioneered the application of Fornell's (1992) logic model and computational methods to establish the SCSB. This model marked the first cross-industry customer satisfaction evaluation model. It was applied to analyze 130 companies across 32

major industries in Sweden.

The SCSB model comprises five variables: customer expected quality, value perception performance, customer satisfaction, customer complaints, and customer loyalty as shown in Figure 2.2 (Anderson & Fornell, 2000).

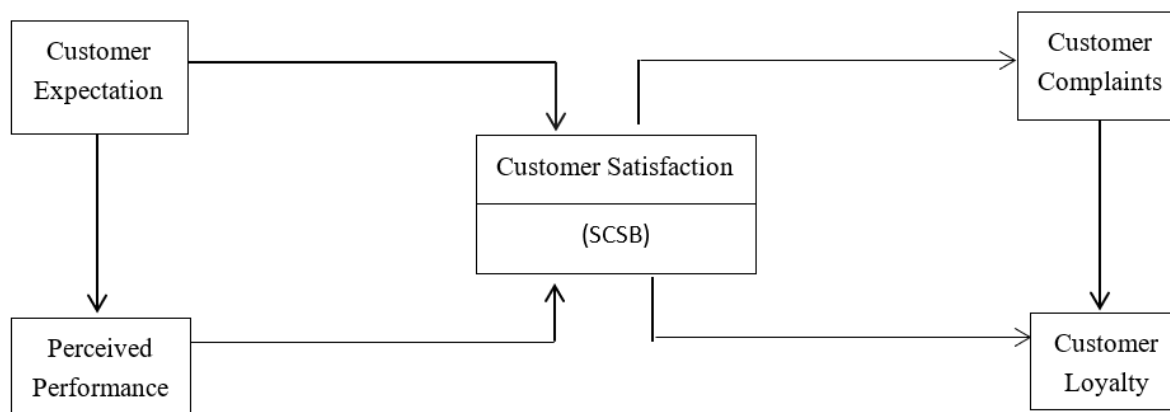


Figure 2.2 SCSB model

Source: Qing (2003)

b. American Customer Satisfaction Index (ACSI)

Fornell et al. (1996) discussed the relationship between differences in products and services and overall satisfaction and industry-level customer satisfaction in the SCSB. They concluded that comparing customer satisfaction across different industries was meaningful. Emphasizing the comparability of customer satisfaction assessments, this approach provided a theoretical foundation for measuring customer satisfaction from a holistic and comprehensive perspective, becoming the cornerstone of the development of the ACSI.

In 1994, Professor Fornell separated customer quality perception from value perception and established the ACSI model (Anderson & Fornell, 2000). By 1998, the ACSI model had been widely applied to over two hundred companies and government agencies in 34 industries across seven sectors (now 11 sectors) in the United States. It is currently the most comprehensive national customer satisfaction model worldwide.

The ACSI model is primarily composed of six factors: customer expectations, quality perception, value perception, customer satisfaction, customer complaints, and customer loyalty, as shown in Figure 2.3 and Table A.1 (in Annex A).

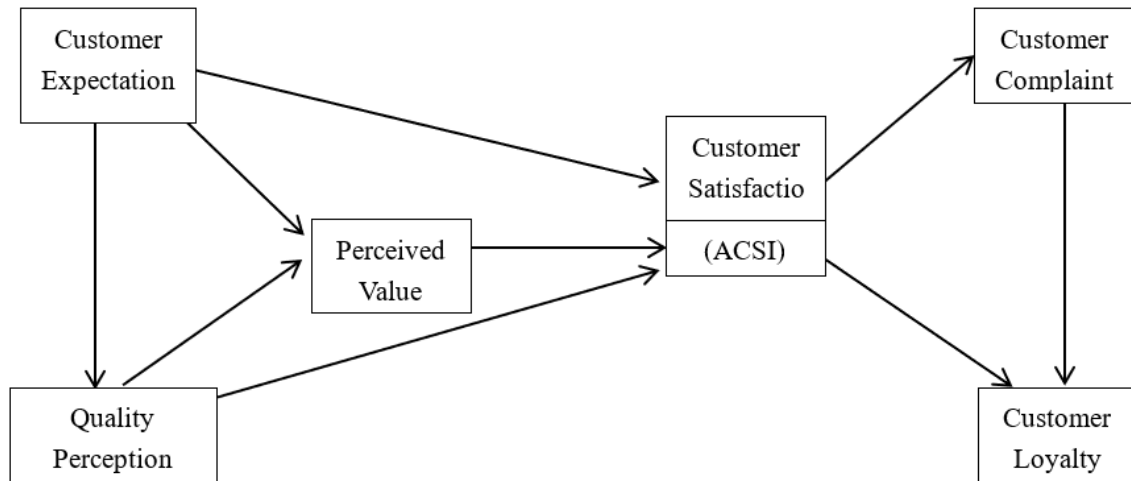


Figure 2.3 ACSI model

Source: Qing (2003)

c. Europe Customer Satisfaction Index (ECSI)

In 1998, through collaborative research involving institutions such as the European Organization for Quality, the European Foundation for Quality Management, and 11 renowned universities recommended by European Union member states, the ECSI was introduced (X. Y. Liu et al., 2003). After its official launch in 2000, the ECSI model was utilized for customer satisfaction index assessments in the 12 member countries of the European Union.

The European customer satisfaction model comprises seven primary factors: company image, customer expectations, quality perception of hardware, quality perception of software, value perception, customer satisfaction, and customer loyalty, as shown in Figure 2.4 and Table A.2 (in Annex A).

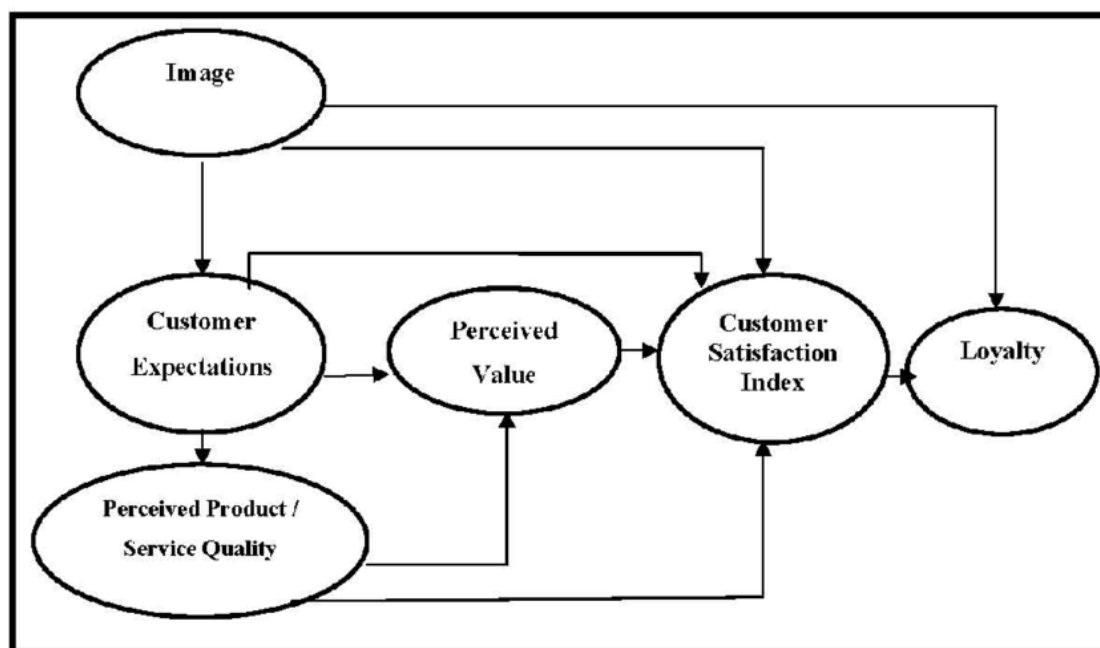


Figure 2.4 ECSI model

Source: Qing (2003)

d. China Customer Satisfaction Index (CCSI)

In 1995, Professor Ping Zhao from Tsinghua University introduced the scientific concept of customer satisfaction to China and proposed a scientific approach for developing an overall customer satisfaction evaluation index tailored to the Chinese context (Qing, 2003). Between 1997 and 2002, after a thorough review of domestic and international research on customer service satisfaction, Professor Zhao delved into the evaluation indicators and components of customer satisfaction in the Chinese context. His work laid the theoretical foundation for constructing the model of China's customer satisfaction index. His series of significant academic papers received high attention from relevant departments of the State Council. In 1999, the Decision of the State Council on Further Strengthening Issues Related to Product and Quality officially highlighted the need to intensify research on methods for evaluating customer satisfaction in China.

Under the coordinated arrangements of the General Administration of Quality Supervision, Inspection, and Quarantine of the People's Republic of China, the China Enterprise Research Center at Tsinghua University, building upon the research outcomes of the ACSI model, proposed improvements specifically tailored to China's situation. Through experimental studies in both countries, the feasibility of China's customer satisfaction index model was confirmed. This marked the beginning of the application of the model in China. In this model, the customer is the main subject of quality evaluation, and the standards are based on customer needs.

In 1998, commissioned by the National Administration of Quality Supervision, Tsinghua University's School of Economics and Management conducted research on the user satisfaction index. In 2002, the China National Institute of Standardization and Tsinghua University jointly developed and introduced the CCSI model (Qing, 2003). This model, built upon the ACSI model, incorporated factors influencing consumer satisfaction, including brand image, expected quality, quality perception, value perception, customer satisfaction, and customer loyalty, as shown in Figure 2.5.

In 2002, the CCSI model was officially recognized by the Ministry of Science and Technology of China as the only nationally certified customer satisfaction assessment method. It has been successfully applied in enterprise decision-making and governmental initiatives. The structural variables of China's service industry customer satisfaction index model have a high degree of applicability and can be used in various service sectors. Given this, this study draws inspiration from this model to design a customer satisfaction model for an online pharmacy.

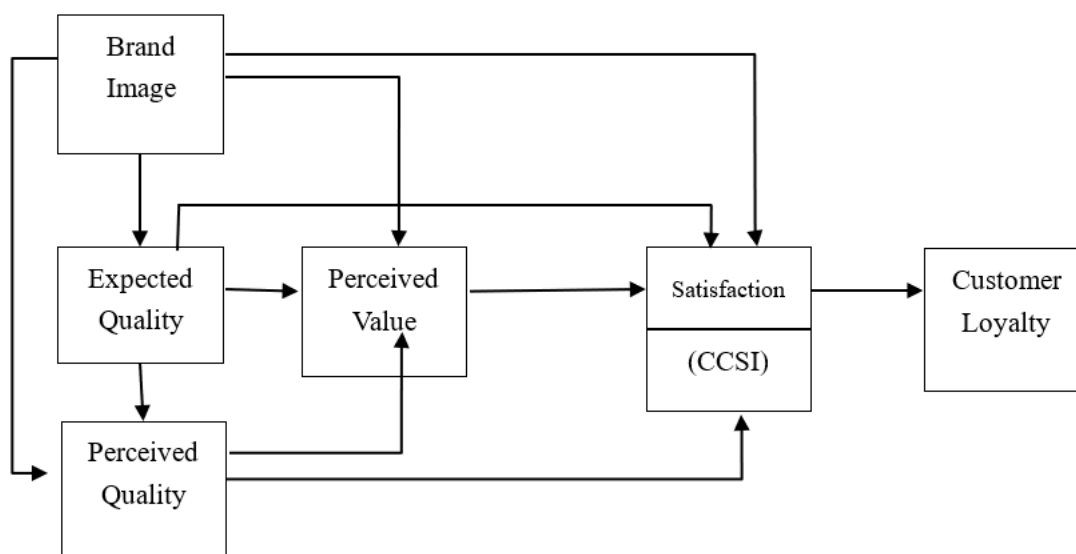


Figure 2.5 CCSI model

Source: Qing (2003)

2.1.5 Factors affecting customer satisfaction in online shopping.

1) Conventional factors affecting customer satisfaction

a. Corporate Image

Corporate image is not only a reflection of product attributes but also a subjective cognitive attitude. Organizational image encompasses core values, team spirit, professional ethics, management style, behavioral norms, management capabilities, talent pool strength,

socio-economic benefits. Organizational image is a reflection of these elements combined (X. Liu, 2004).

b. Customer expectations

Customer expectations play a crucial role in how customers perceive products and services. By comparing expectations with experiences, customers ultimately evaluate the quality of products or services. The customer expectation model was initially rooted in organizational behavior and social psychology. Based on the consistency between expectations and experiences, satisfaction is achieved in stages. In the first stage, there is a gap between expectations and experiences, resulting in inconsistency. In the second stage, this inconsistency is interpreted as different reactions to satisfaction, dissatisfaction, and moderate satisfaction. Hence, the customer expectation model is also referred to as the expectation inconsistency model (Fornell, 1992).

c. Quality perception

In the study of service quality, Parasuraman et al. (1985) posited that quality perception determines customers' overall judgment of the goodness or badness of a product or service. Quality perception is a customer-centric subjective judgment. Unlike objective quality, it emphasizes customers' subjective judgment of service quality. Zeithaml suggests that quality perception is a holistic judgment similar to an attitude, reflecting the subjective abstract evaluation of a product or service derived from comprehensive analysis (X. Liu, 2004).

Given the current factors influencing product or service quality and assessment methods, Parasuraman et al.'s empirical measurement of perceived service quality dimensions is groundbreaking. Therefore, the SERVQUAL model remains authoritative and mainstream in the academic field. For marketing companies specializing in products and services, the most crucial task is to enhance customers' perception of product quality through various channels. They identified five main aspects of service quality: empathy, responsiveness, assurance, reliability, and tangibles (Garvin, 1988).

d. Value perception

Value perception refers to customers' evaluation of the balance between expenditure and actual income during the process of purchasing products or services. Research indicates that customers have a deeper memory of the meaningful value in their minds rather than the actual value of the product or service they consumed (X. Liu, 2004).

e. Perceived Fairness

Fair and reasonable transactions are known as fair transactions. Fairness is a fundamental human need. If customers perceive that the benefits and costs of transactions with a company

are equivalent, the transaction is fair. Social exchange theorists propose three fundamental aspects of perceived fairness: distributive fairness, procedural fairness, and interactional fairness.

f. Customer Trust

Customer trust is a gradually formed attitude of confidence in the reliability and quality of products or services. Customer trust is particularly important in e-commerce, especially in the context of online pharmacies. Gaining customer trust is a crucial guarantee for the operation of internet-based companies.

g. Customer Commitment

Customer commitment refers to the psychological state in which customers desire to maintain a consumption relationship or behavior. Customer commitment is often evaluated based on subjective feelings of whether customers have a sense of belonging and identification with the service enterprise. It reflects the willingness of customers to maintain a long-term relationship with the company.

h. Customer Loyalty

Customer loyalty refers to the long-term, designated, repeated purchase of one or several alternative brands. In the ACSI model, the decision evaluation function has three variable factors: whether customers will increase their purchase quantity upon repurchasing, whether they will recommend the company or brand, and the likelihood of customer retention.

i. Customer Complaints

Customer complaints refer to customers' dissatisfaction or reproach about products or services. In the ACSI model, customers generally indicate dissatisfaction through refusal to purchase and lodging complaints for compensation.

2) Research on Factors Influencing Customer Satisfaction in E-commerce Models

E-commerce primarily refers to a business operation and profit management model formed based on certain information technologies under the conditions of an open-market economy network on the Internet. It enables relevant business and trade activities to be conducted extensively on a global scale. E-commerce can be categorized into various models based on the different transaction subjects. Four common ones include B2B, B2C, C2C, and C2B.

Among these, the B2C model is currently the most common on the Internet, involving activities such as consumer online shopping and online information queries. Under the B2C model, consumers can easily gather information and make better product or service comparisons. Therefore, attracting repeat consumers has become a critical task for the

development of various e-commerce websites. Establishing good long-term relationships with consumers has become a goal for major enterprises in the e-commerce domain. To achieve this goal, price is no longer considered a key factor. Price wars are simple and easily replicable tactics, and thus cannot be a significant factor in maintaining long-term customer relationships. Instead, factors like service quality, swift and convenient transactions, and security have gradually become essential principles for consumers in selecting online shopping and engaging in repeat purchases (H. Zhang, 2014).

The advent of the internet has revolutionized the way people shop, primarily evident in the significant changes in trading platforms, payment methods, and communication modes. The shift from traditional shopping methods to e-commerce models has broken the spatial and temporal limitations of physical stores, altering face-to-face communication modes in brick-and-mortar shops and innovating online payment methods. This shift requires platform enterprises to first gain customer trust through new models before taking the initial steps in transactions.

Apart from these three apparent differences, e-commerce shopping websites have also undergone substantial changes in attracting and retaining customers. On one hand, major shopping websites like Amazon, eBay, and Dangdang leverage the reputation and transaction rules of various existing e-commerce platforms on the internet. They gradually establish their website reputation by increasing the number and value of transactions, using this as a platform to expand internet trade.

On the other hand, in the traditional context, a customer could only convey satisfaction or dissatisfaction messages to people around them, influencing their purchase decisions within a limited scope. However, in the realm of e-commerce, customers can provide product reviews through online forums, which can impact a larger audience.

In comparison, studies on customer relationship benefits in traditional environments have divided these benefits into confidence benefits, social benefits, and special treatment benefits. However, there has been a debate regarding the dimension of authority in influencing customer relationships in the context of the online environment. The main reason for this debate arises from the fact that in the virtual world of the internet, there are limited opportunities for face-to-face interactions and communication. Therefore, some scholars have proposed that social benefits do not exist in the online environment. Conversely, other scholars argue that the dimension of social benefits does exist in the online environment and have extended the meaning of social benefits in this context. Some researchers, like Cui et al., believe that the communication and interaction between customers online also fall under

social benefits (Cui et al., 2006; H. Zhang, 2014).

In reality, with the rapid development of the internet economy, e-commerce websites are also growing quickly, showing significant differences in design styles and service quality. This diversity gives consumers more choices. However, in practice, many consumers tend to shop on the same website repeatedly due to their familiarity with its design and layout. This emotional connection between consumers and websites is formed over the long-term shopping process. Additionally, due to the intense competition among e-commerce websites in recent years, many websites have incorporated entertainment elements to attract consumers. For instance, the Tmall shopping website introduced promotional activities that enhance the enjoyment of the website's marketing. As e-commerce websites evolve, their entertainment aspects are gradually strengthened (H. Zhang, 2014).

As China's internet market economy continues to rapidly expand, coupled with the constant improvement of mobile internet technology and social progress, online shopping is becoming more popular. Because of its complete virtualization based on e-commerce, scholars hold different opinions on whether relationship marketing should be implemented in this environment. Some argue that in the internet environment, lack of genuine communication between individuals makes it difficult to establish relationships based on virtual technology. Other scholars point out that building long-term relationships with customers in this context requires two key conditions: ongoing interactive communication between the company and customers, and a solid information exchange mechanism. The internet effectively fulfills both these conditions, as its nature surpasses time constraints and enables increased communication between businesses and consumers, thereby promoting the realization of relationship marketing (H. Zhang, 2014).

In the e-commerce environment, there is limited research on the dimension of customer relationship benefits. Many scholars directly apply the dimensions of customer relationship benefits from traditional environments (confidence benefits, social benefits, special treatment benefits) to the study of e-commerce environments. However, existing research also presents controversies. Cui et al. (2006) discovered, through qualitative studies on consumers, that in the online environment, customer social benefits manifest in the continuous interactions between customers, uncovering the dimension of honor benefits.

The characteristics and convenience of the internet and e-commerce have significantly transformed the content of customer satisfaction. In the offline shopping model, customers directly purchase from physical stores. However, in the e-commerce environment, customers interact primarily with websites as shopping platforms and secondarily with the products in

online stores. Moreover, the e-commerce environment severs the connection between financial flows and logistics, resulting in information asymmetry due to the anonymity of consumers and businesses. These factors have led to distinct changes in the factors influencing customer satisfaction in the e-commerce environment (Ni, 2015).

Firstly, quality and price are crucial factors in customer satisfaction regarding value perception.

According to data from a simplified version of the 2015 China Online Shopping User Survey, the main influencing factors on customers' online consumption in the previous year, 2014, were the quality of website products and the price level of website products, with proportions of 47.7% and 46.9% respectively. Therefore, in the e-commerce environment, customer demands for quality and price have a direct impact on customer satisfaction.

Secondly, various other factors also significantly influence customer satisfaction:

Cybersecurity: Since e-commerce transactions are primarily conducted online, the transmission and flow of information data and funds over the internet, along with the uncertainty of online transactions and identities, can lead to inevitable security risks. This includes the circulation of network platform data, transaction information, and other funds. From this perspective, online businesses and e-commerce companies need to establish comprehensive internet e-commerce security management systems to ensure the security of consumer information and financing, preventing online fraud and information theft. Enhanced security measures, including more secure payment methods, can be implemented to ensure online consumers' perceived security in their shopping experiences (D. Zhao, 2009; Mi & Liu, 2020).

Integrity: Unlike traditional shopping, online shopping provides convenient access to vast amounts of product information. However, this convenience is coupled with the challenge of information reliability and transparency. At this juncture, the credibility and reputation of businesses become particularly crucial. Most companies consider integrity as a significant indicator for selecting business partners, even surpassing factors such as quality and price. Therefore, enhancing integrity should be incorporated into the development strategies of enterprises. If a majority of customers perceive a store to treat customers fairly and to sell products honestly and reliably, other customers will refer to their opinions, considering the store trustworthy and suitable for shopping. Businesses' responsiveness to customer feedback and communication also impacts the customer shopping experience.

Customer Service: A key feature of e-commerce is the convenience of information exchange. Customers can easily communicate with businesses when they have inquiries, free

from limitations of time and geography. This presents both opportunities and challenges for e-commerce companies, as businesses must promptly respond to customer requests or issues. Research shows that if customer requests or problems are not addressed within 24 hours, customers tend to shift to other businesses, as the focus on customer experience outweighs marketing efforts.

Another important aspect is how businesses handle customer complaints. An American survey indicated that when customer complaints are not resolved adequately, over 80% of customers become dissatisfied and discontinue their engagement with the business, impacting how others perceive the business. On the contrary, when customer complaints are satisfactorily resolved, dissatisfaction stemming from product issues is alleviated. Over 80% of customers regain satisfaction, and they share this positive experience, creating favorable perceptions of the company among other customers. Hence, companies should prioritize communication with consumers, establish a rational and comprehensive customer service mechanism, and provide excellent customer service to ensure customer satisfaction.

After-Sales Service: After-sales service is a crucial means of protecting consumer rights, and thus, consumers have higher expectations for after-sales service. Due to the lack of transparency in certain information during online transactions, customers cannot directly inspect products and must wait through a series of processes, from purchase to delivery, to receive goods. During this journey, various issues may arise, potentially resulting in damaged or defective goods. Consequently, consumers will require businesses to provide after-sales service (Y. Tian, 2016). If businesses can promptly address and rectify problems or handle consumer complaints, customers will perceive that their interests are well-protected, leading to continued transactions with the business and increased customer satisfaction.

Logistics Experience: An e-commerce transaction encompasses four fundamental factors: information flow, fund flow, commercialization, and logistics. The first three processes can be directly conducted through mobile internet or computers. However, for physical goods, spatial and temporal transformations are required. This involves various stages of transportation and distribution in the logistics chain of China's e-commerce. Additionally, this stage involves more face-to-face communication with customers, directly influencing customer satisfaction and subsequently affecting a company's reputation and core competitiveness (L. L. Liu, 2010).

Website Interface: For e-commerce companies and businesses, their websites serve as both a marketplace and a battleground. Most e-commerce platforms interact directly with customers via web browsers. Hence, website interfaces must be user-friendly and visually appealing while ensuring complete functionality. The website itself should be robust, stable,

compatible, and secure. According to foreign data, if customers cannot find the products they need on the interface or encounter navigation difficulties, over half of the customers will abandon the website and the transaction. If the navigation on the page is unclear and the response and download speeds are slow, 80% of customers will abandon the website and the transaction (L. L. Liu, 2010).

Through a comparison between online shopping and traditional shopping, L. Zhang (1999) analyzed the main psychological factors that hinder online shopping satisfaction: inability to directly interact with products, presence of counterfeit goods, unregulated online market behavior, overly simplistic interpersonal communication and information exchange methods, among others.

H. F. Yang (2002) suggested that customer satisfaction can promote enterprises to achieve better long-term operations and profitability in the market. This is not only a necessary condition for the long-term success of China's e-commerce industry but also a crucial key to achieving healthy and rapid development of internet shopping. He further proposed that the main factors influencing customer satisfaction in online shopping include system performance, product quality, guarantees, and customer relationships.

Zha and Wang (2006), based on the uncertainty theory of customer expectations and the evaluation theory of business service quality, established a model depicting the relationship between business website expectations, service quality, and customer satisfaction. They divided the service quality of business websites into eight dimensions: design characteristics, network security, online communication, price advantage, product quality assurance, customized services, convenience, and operational management difficulty. An empirical survey revealed that consumers' perceived service quality of shopping websites and their expectations of the online shopping process collectively influence their satisfaction with shopping websites. Among these factors, the most significant influences on online shopping customer satisfaction are network security, price advantages, and store product quality attributes. Additionally, the positive impact of website design on customer satisfaction is not particularly pronounced.

Meng et al. (2007) asserted that customer service satisfaction directly affects consumers' decisions to make purchases online. They specifically identified product quality, security provided by shopping websites, website services, and the convenience of online shopping as the key factors influencing consumers' online purchasing decisions. Through empirical verification, they proposed strategies that could enhance business customer satisfaction.

H. Y. Li and Lin (2009) applied the theory of online transaction costs to explore online

shopping satisfaction, discussing the interrelationships among time efficiency, cost savings, and customer satisfaction in online shopping.

Zhai and Ye (2009) evaluated and measured customer satisfaction by considering factors such as consumer satisfaction with products and after-sales service in online shopping. The study primarily focused on Chinese university students, and a structured equation model was used to verify the importance and impact of customer loyalty.

D. L. Xu and Wang (2010) analyzed three stages of customer online shopping—pre-transaction, online exchange, and post-transaction—to identify subjective factors that directly influence consumer satisfaction. These factors include website features, store services, pre- and post-sales services, transaction payments, and logistics distribution. Based on this analysis, they reconstructed a model of customer satisfaction.

Based on an extensive review of relevant online literature and in-depth interviews, F. Wang (2010) initially developed a theoretical model of the factors affecting customer satisfaction in online customer service. This was further supported by an empirical study conducted through questionnaires. The researchers found that perceived service quality directly affects customer satisfaction. The four dimensions of service quality (effectiveness, reliability, ownership, and privacy), as perceived by customers, indirectly affect customer satisfaction.

From the literature cited above, it is evident that the main factors influencing customer satisfaction in online shopping are based on customer satisfaction in traditional brick-and-mortar shopping under China's traditional economic model, combined with the characteristics and factors of online shopping.

3) Factors Affecting Customer Loyalty

Customer satisfaction directly influences customer loyalty due to the presence of many similar influencing factors between them, which can mutually corroborate each other (Shen, 2005). Notably, e-commerce, a burgeoning business model, has its origins in the rise of the information environment. Over the past decade, domestic scholars have conducted extensive in-depth research on customer loyalty in the online shopping sector. Various scholars have explored factors influencing online shopping customer loyalty from different angles, thereby constructing a customer satisfaction model based on the context of online shopping.

In the early stages of research, academia rarely differentiated customer satisfaction and loyalty in the e-commerce domain from their traditional counterparts. For example, some scholars believed that online customer loyalty was no different from traditional customer satisfaction, primarily reflected in behavioral aspects such as repeat purchases, increased

frequency and amount of purchases, and enhanced price tolerance (Reichheld & Sasser, 1990). It was not until 1999 that researchers began introducing new elements into studies of online customer loyalty, including the frequency of consumers' regular visits to websites, the duration of each visit, and the breadth and depth of information browsing (Gillespie et al., 1999). Srinivasan et al. (2002) defined loyalty in e-commerce as repeated purchases resulting from a customer's preference for an online retailer.

International scholars have also proposed a data model for analyzing enterprise loyalty to e-commerce, indicating that the three significant influencing factors for e-commerce consumer loyalty mainly include five aspects: perceived value, brand building, trust and security, website technology, and customer service (Gommans et al., 2001).

While exploring the driving factors of online loyalty, scholars particularly emphasized the roles of online satisfaction, relational trust, and customer-perceived quality in shaping customer loyalty. Through empirical research conducted on 90 online travel agencies and CD retailers, it was concluded that customer satisfaction, established trust relationships, and customer perceptions of product and service quality have significant impacts on shaping online loyalty (Luarn & Lin, 2003).

Based on a comprehensive review of foreign research, combined with domestic realities, it is suggested that the assessment model for e-commerce customer loyalty should be approached from four dimensions: intrinsic value, emotional investment, realization costs, and consumer participation, explicitly pointing out that intrinsic value plays a primary role in affecting e-commerce customer loyalty (Lv et al., 2005).

Moreover, empirical research conducted on university students at Peking University with internet learning and work experience showed that customer satisfaction and switching costs have a much greater impact on customer loyalty than customer trust (B. Zhao, 2005).

When confirming the factors influencing customer loyalty in e-commerce, the general view is that key factors of traditional enterprise customer loyalty are equally applicable to e-commerce. These factors include perceived value, relationship-building trust, and customer satisfaction. However, some scholars, acknowledging the uniqueness of e-commerce loyalty, specifically consider network technology and online security. Nevertheless, there are some shortcomings. First, although these factors' effects in e-commerce are considered, in-depth research on their specific impact and whether they directly or indirectly affect loyalty is still lacking. Second, the aforementioned researchers typically explored the factors influencing e-commerce customer loyalty only in their areas of expertise, which could lead to an incomplete understanding. Therefore, there is a need for further integration and synthesis of these

research findings (B. Zhao, 2005).

Upon a comprehensive review of experts' opinions and research findings in the field of management, it is evident that studies on customer satisfaction in the e-commerce domain have made significant progress and achievements. It is worth emphasizing that scholars have explored and analyzed factors affecting customer satisfaction from multiple different angles, providing a robust theoretical foundation and empirical support for future research.

2.2 The conceptual model and hypotheses

Based on the collective findings from customer satisfaction surveys and research conducted in both domestic and international internet pharmacies, along with practical experience, the unique characteristics of China's internet pharmacy industry, expert recommendations, and past customer surveys, we have primarily based the research on the CCSI model. Using this foundation, hypotheses were proposed that influence customer satisfaction in online pharmacies and subsequently construct a theoretical model of customer satisfaction for internet pharmacies. The construction of this model consists of two main components: the selection of latent variables and the establishment of relationships among these variables.

2.2.1 Principles for constructing the internet pharmacy customer satisfaction model

1) Theoretical Foundation of the Model

Currently, there is limited research on customer satisfaction evaluation in online pharmacies, both domestically and internationally. While constructing this model, this study extensively reviewed relevant literature in fields such as marketing theory, statistics, social sciences (H. Sun et al., 2010; Huo, 2004; J. Zhang, 2013; Y. Liang, 2010; Z. Zhang, 2011), as well as suggestions related to customer service satisfaction. Through analysis and synthesis, this study deduced the primary factors influencing customer satisfaction in online pharmacies and their causal relationships. The model's foundation is also rooted in the extensive experience of experts in the field and previous service research. Statistical software was employed to verify the relationships between relevant variables. By combining quantitative research with qualitative analysis, the model's theoretical rigor and standardization are ensured.

2) Comparability of the Model

Due to variations in style, business models, traffic sources, and customer demographics among different internet pharmaceutical e-commerce platforms, the model for internet

pharmacy customer satisfaction was designed by focusing on the commonalities of various platforms and online drug purchasing patterns. Shared influencing factors to construct the research model are identified.

3) Borrowing from Domestic and International Research and Practices

Currently, countries and regions such as Sweden, the United States, and Europe have made significant progress in researching domestic and industry-specific customer satisfaction. These efforts have accumulated valuable experience. When designing the internet pharmacy customer satisfaction model, we drew upon these valuable research findings to enhance the model and potentially contribute to the formation of industry standards.

4) Reflecting the Characteristics of Internet Pharmacy Consumption

In the process of purchasing medications online, there are various factors that significantly influence customer satisfaction. However, the primary focus should be on the differences between online pharmaceutical purchases and traditional brick-and-mortar pharmacy purchases. This distinction can be divided into two main aspects.

On one hand, there are substantial differences in information exchange, payment methods, logistics, and post-purchase services between online shopping and physical store shopping. It is imperative to differentiate and address these aspects distinctly.

On the other hand, pharmaceutical products are subject to strict national regulations, setting them apart from regular everyday commodities. Moreover, the purchasing of medications involves a multitude of professional considerations, distinct from ordinary items. Mishandling these aspects can severely impact customer trust and perception.

2.2.2 Establishing the conceptual model of customer satisfaction for internet pharmacies based on the CCSI Model

Through the preceding discussion, we have comprehensively understood and investigated the strengths and weaknesses of several commonly used international customer satisfaction models (as detailed in section 3.1.3.2). This study has chosen to primarily base and optimize the construction of the research model for customer satisfaction in internet pharmacies on the CCSI model. This decision is rooted in several key reasons:

a. Authority Perspective: The CCSI model is the only nationally validated method for customer satisfaction assessment within the country.

b. Applicability Perspective: Its structural variables demonstrate strong generality and theoretical applicability across various service industries. Particularly, when supplemented

with variables related to corporate image, it aligns well with the consumption habits of the Chinese population.

c. Empirical Perspective: Combining expert recommendations and insights from numerous user surveys conducted in the preliminary stages, it is believed that the CCSI model is better suited for assessing customer satisfaction in the context of internet pharmacies.

2.2.3 Selection of latent variables for the customer satisfaction model of internet pharmacies

Building upon the CCSI model and considering the operational characteristics of online pharmaceutical platforms, as well as drawing insights from relevant literature, six latent variables have been identified to be included in the conceptual model. These variables are corporate image, quality perception, customer expectations, value perception, customer satisfaction, and customer loyalty.

In choosing between the terms “Corporate Image” and “Brand Image,” both of which have been used in various studies, this study selects “Corporate Image” to best suit the distinct nature of medical e-commerce platforms, rather than “Brand Image” that is originally used in CCSI. As platforms for pharmaceutical sales, medical e-commerce enterprises have multiple commodities (medications) with individual “brands.” The term “brand” can carry ambiguity, referring to either the product’s brand or the platform’s brand. It is believed that the term “Corporate Image” better highlights the unique attributes of platform enterprises and provides a more comprehensive representation.

Moreover, traditional customer satisfaction models often encompass quality perception, including perceptions of product quality and service quality. In this study, informed by the author’s industry experience and interviews with several experts in the field of internet pharmacies, the variable of quality perception has been refined to encompass four dimensions: product quality perception, service quality perception, medical professionalism perception, and logistics experience. These dimensions are considered crucial due to the specialized nature of pharmaceutical products and the unique demands placed upon medical e-commerce platforms. The emphasis on professionalism is integral, as customers have heightened expectations for the platform’s expertise, and professionalism plays a pivotal role in fostering customer trust. Logistics issues, which have long troubled e-commerce enterprises, are also a significant concern (Fang, 2005).

In the following sections, this thesis will provide definitions for the operability of the six

potential variables of interest within the framework structure of the thesis. Additionally, this thesis will elucidate the theoretical foundations that underlie the process of variable selection for the chosen model.

1) Corporate image

Corporate image refers to the overall impression people have of a company in the course of interacting with it. Company image is the outward manifestation of the company's spirit and culture, established through various symbols (such as product features, marketing strategies, employee styles (H. Y. Li, 2011)). In this study, corporate image primarily represents consumers' attitudes and perceptions toward the medical e-commerce enterprise before making online purchases of pharmaceutical products.

Corporate image is a critical resource for companies to expand market share, enhance competitive advantages, and achieve established goals. No internet e-commerce enterprise can do without a favorable corporate image. This necessitates effective publicity and high-quality product and service delivery to convey brand information to the public and potential customers. Across the design models of both ECSI and CCSI, the overall relationship between customer satisfaction, the entire enterprise, and its brand image is considered. Brand image activities are regarded as latent variables with significant direct effects on both overall customer satisfaction and enterprise expectations. In the current European customer satisfaction evaluation models, image has been widely recognized as an important latent variable that can signify customer feelings toward a particular brand. This model posits that brand image is an attitude that influences consumer satisfaction. In this study, the image of online pharmacies is mainly reflected in consumers' pre-purchase evaluations of the online pharmacy, signifying consumers' identification and trust in the chosen online pharmacy. Furthermore, the CCSI model introduces the corporate image variable, reflecting researchers' universal recognition of the importance of this variable.

For online shopping, trust is a crucial connecting factor, which is even more pronounced compared to traditional brick-and-mortar shopping. In the case of pharmaceutical retail, due to its connection to the health of consumers or patients (which are sometimes not the same individuals), people place heightened importance on this aspect. Consumer trust in an online platform enterprise is directly related to whether customers choose to use that platform. Hence, the corporate image becomes the preferred antecedent variable in the pursuit of customer satisfaction.

2) Quality perception

Taking into consideration the characteristics of online pharmacies, this thesis emphasizes

the observation of quality perception from four aspects: product quality perception, service quality perception, perception of pharmaceutical expertise, and logistics experience.

a. Product Quality Perception and Service Quality Perception

Both product quality perception and service quality perception are integral components of quality perception. Customer perception of the quality of products or services offered by online pharmacies refers to the customers' feelings and experiences regarding the overall quality of medical products and services provided through the online platform. This perception of quality is a core factor in customer satisfaction and directly influences the degree of satisfaction customers have towards the platform. Product quality perception can directly impact customer satisfaction and can also affect satisfaction through the gap between perception and expectation.

When a company's products or services far exceed the price that customers pay to satisfy their needs, customers are likely to be more satisfied. There is a clear positive correlation between perceived product or service quality and customer satisfaction. Within the ESCI model, quality perception is subdivided into hardware quality perception and software quality perception (see Figure 2.4).

Consumers not only experience unseen service when consuming goods but also have tangible feelings about the products. This combination ultimately forms customers' impressions of the overall quality of the online pharmacy. The integrity of service quality perception in online pharmacies requires collaborative efforts from various departments within the internet platform to enhance customers' perception of both product quality and after-sales service quality, thus increasing customer satisfaction. This forms the core content and crucial aspect of service quality attributes for online pharmacies. Customers' purchases of medications from online pharmacies directly impact personal health. Severe quality issues could lead to health risks, treatment delays, and even life-threatening situations, which are unacceptable for any consumer. Simultaneously, patient and meticulous after-sales service by website personnel, along with accurate and efficient delivery methods, significantly influence customer satisfaction with the pharmacy. The quality of sales and services is an important element in further enhancing customer satisfaction with online retail platforms. Consequently, this study also considers product quality perception and service quality perception as vital constituents of quality perception for online pharmacies.

b. Perception of pharmaceutical expertise

An important distinction of online pharmacies from conventional e-commerce platforms is that they sell pharmaceutical products. According to expert interviews and industry

experience, customers' perception of pharmaceutical expertise can significantly influence their satisfaction. Firstly, this perception contributes to customers' trust in the platform. The more professional the industry, the more significant the role of expertise. Secondly, the presentation of product information and the conduct of pre-sales and after-sales services often require guidance from pharmaceutical professionals. Additionally, ensuring customer health and handling various pharmaceutical issues also necessitates a level of pharmaceutical expertise. Therefore, this study considers the perception of pharmaceutical expertise as a crucial component of quality perception for online pharmacies.

c. logistics experience

Logistics experience is another essential component of quality perception for online pharmacies. Logistics issues are pivotal for all e-commerce platforms, with even greater importance for pharmaceutical e-commerce platforms. Pharmaceutical distribution is subject to national regulations, with legal constraints in production, distribution, storage, and sales. Consumers often have higher logistic requirements for pharmaceutical products compared to regular goods. In addition to demanding prompt delivery, they also require quality assurance during transportation and traceability in the pharmaceutical distribution process. China's major e-commerce players, such as JD.com with its self-built logistics and Alibaba's Cainiao logistics integration, all strive for a leading position in logistics.

However, for most emerging Chinese vertical pharmaceutical e-commerce platforms, due to their limited scale as vertical e-commerce models, they cannot yet establish their own logistics systems. As a result, the quality of third-party logistics directly impacts customer satisfaction. Therefore, this research focuses on Ark Pharmacy, a representative domestic leader in online pharmacies using third-party logistics, analyzing the impact of third-party logistics on customer satisfaction with online pharmacies.

3) Customer expectations

Consumer expectations refer to the "anticipatory anticipations" that consumers hold based on past online shopping experiences, individual needs, website credibility, and more, before engaging in purchasing behaviors. As previously mentioned, reviewing several classic models of customer satisfaction indexes reveals that customer expectations are almost a universal variable in customer satisfaction research, grounded in the Expectancy-Performance Theory. Customer expectations are considered in online pharmacies to encompass the hopes and anticipations customers have for the quality and services related to online pharmaceutical purchases before they make their selection. Research indicates that customer expectation significantly influences customer satisfaction (L. Pan, 2020).

In general, customers' expectations of online pharmacies are primarily manifested in three important aspects. First, customers have high expectations for the quality and safe use of pharmaceutical products from online pharmacies. When customers engage in online pharmaceutical shopping or other service consumption activities, they often anticipate receiving patient explanations, professional knowledge, honest dealings, and professional accountability from the pharmacy operators. These expectations are formed through information obtained from online advertisements, friend recommendations, and other sources, as well as from customers' past shopping and consumption experiences. These accumulated experiences and information directly shape customers' perceptions and expectations of internet medical pharmacies, impacting their purchase decisions and ongoing purchasing behaviors.

4) Value perception

Value perception refers to the evaluation of the balance between expenditure and actual income that customers make during the process of purchasing products or services. This evaluation includes customers' assessments of product prices based on established product quality and assessments of product quality based on established product prices. We agree that value perception, to a larger extent, represents the meaningful value that customers hold in their minds, rather than the actual value of the products or services they consume. Value perception is also a common variable in several classic theoretical models, and hence, this study includes value perception within the research model for observation.

5) Customer satisfaction

Customer satisfaction is a subjective evaluation and psychological reflection that customers make about their shopping and consumption experiences online. It directly determines whether customers will choose to shop on the enterprise's website again. Generally, online pharmacy consumers exhibit the following conditions when comparing their perceptions to their expectations: post-purchase feelings surpass pre-purchase expectations. If customers perceive higher quality, service quality, or value perception than their initial expectations from online pharmacies, they experience happiness and contentment, leading to a sense of satisfaction. Satisfaction can be measured by the difference between post-perception and pre-expectation.

6) Customer loyalty

Customer loyalty refers to the sense of satisfaction generated during the process of purchasing pharmaceutical products from online pharmacies, leading to repeated purchasing intentions or active recommendations during consultations with friends and family. Customer

loyalty is a crucial variable in customer satisfaction research and a direct outcome variable of such research. Building on classic customer satisfaction models, this study also includes customer loyalty as a latent variable in the online pharmacy customer satisfaction model.

2.2.4 The conceptual model of internet pharmacy customer satisfaction and research hypotheses

Once the latent variables have been selected, establishing the structural model requires clarifying the relationships between these latent variables. In this section, this thesis will present the Conceptual Model of customer satisfaction for online pharmacies and the corresponding research hypotheses based on literature analysis.

1) Relationship between corporate image and other latent variables

In the CCSI model, corporate image directly influences all variables except customer loyalty. Before purchasing pharmaceutical products from online pharmacies, consumers gather information about brand images and platform reputations from various sources to base their purchasing decisions. Customer fervor, profound product perceptions, service satisfaction, and the company's brand image are intricately linked. Furthermore, a better brand image often corresponds to a higher perceived product value, which is reflected in product pricing. Perceived product quality, service quality, and pharmaceutical expertise are also frequently positively influenced by a positive corporate image.

In addition, based on expert experiences and a comparative analysis of e-commerce and traditional retail, it is believed that in situations where shopping cannot be experienced in person and on-site, the significance of the corporate image on online platforms in the minds of consumers even surpasses that of offline platforms. While referencing the works of other scholars (J. Liu et al., 2004; Y. Liang, 2010), this study further investigates the influence of corporate image on customer loyalty. Consequently, this research proposes the following hypotheses:

H1a: Corporate image has a direct positive impact on quality perception.

H1b: Corporate image has a direct positive impact on customer expectations.

H1c: Corporate image has a direct positive impact on value perception.

H1d: Corporate image has a direct positive impact on customer satisfaction.

H1e: Corporate image has a direct positive impact on customer loyalty.

2) Relationship between Customer Expectations and Other Potential Variables

Regarding the relationship among customer expectations, value perception, and customer

satisfaction, a significant portion of scholars agree that the predictive function of customer expectations mainly involves assessing how customer expectations have a direct or indirect positive impact on customer satisfaction (Fornell, 1992; S. J. Wang, 2003; Y. Li, 2008;). Excessively high expectations may not be met in reality and could yield contrasting results. The CCSI model investigates customer expectations as direct influencing factors on quality perception, value perception, and customer satisfaction. Therefore, this study proposes the following hypotheses:

H2a: Customer expectation has a direct positive impact on quality perception.

H2b: Customer expectation has a direct positive impact on value perception.

H2c: Customer expectations has a direct positive impact on customer satisfaction.

3) Relationship between Quality perception and Other Potential Variables

Perceived product quality and service quality have a direct positive impact on customers' judgments of transaction value in purchase behavior, as well as a direct positive impact on customer satisfaction, and they exhibit strong correlation (N. Liu, 2016; X. Liu, 2004). In alignment with the CCSI model, this study posits that quality perception has a direct positive impact on value perception and customer satisfaction. Therefore, this study proposes the following hypotheses:

H3a: Quality perception has a direct positive impact on value perception.

H3b: Quality perception has a direct positive impact on customer satisfaction.

4) Relationship between Value Perception and Customer Satisfaction

Value perception generally directly or indirectly influences customer satisfaction (Fornell, 1992; Y. Li, 2008). Value perception emerges during the online shopping process, and a high level of value perception brings customers a sense of high satisfaction, whereas a low level of satisfaction results in lower value perception. Value perception becomes the foundation and premise for customers' satisfaction with their shopping process. From the perspective of selecting latent variables for customer satisfaction index models in different countries, value perception is a primary factor affecting customer satisfaction. Therefore, this study proposes the following hypothesis:

H4: Value perception has a direct positive impact on customer satisfaction.

5) Relationship between Customer Satisfaction and Customer Loyalty

Regarding the impact of customer satisfaction on customer loyalty, researchers have concluded through theoretical and empirical studies that an increase in customer satisfaction directly leads to an improvement in customer loyalty. Customer loyalty serves as an intermediary variable between customer satisfaction levels and a company's profitability,

playing a significant role (Anderson & Fornell, 2000). Customer satisfaction has a significant positive impact on customer loyalty. Low customer satisfaction is likely to lead to customer complaints and grievances, thereby affecting a company's efficiency (N. N. Wang, 2020; Y. Zheng, 2020). This study posits the following:

H5: Customer satisfaction has a direct positive impact on customer loyalty.

Based on the analysis of each potential variable's selection and their relationships outlined above, this study presents a causal logic model and hypotheses reflecting the correlations among these potential variables, as shown in Figure 2.6.

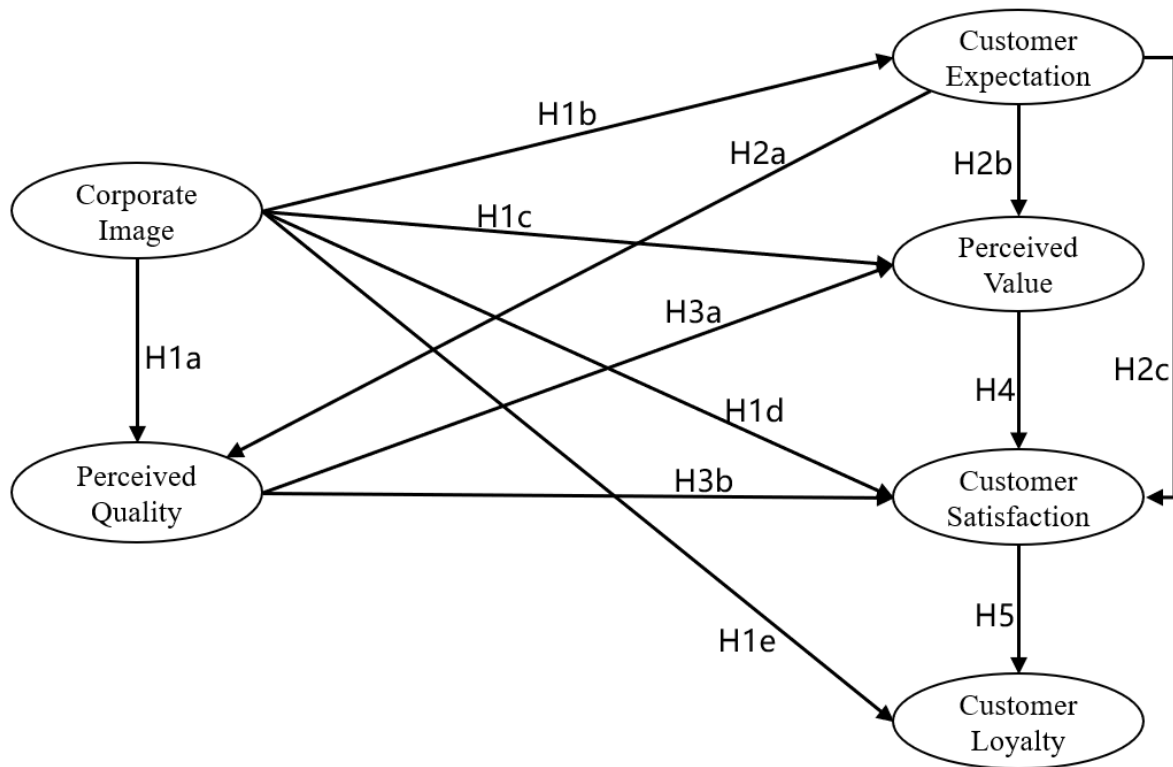


Figure 2.6 The conceptual model and hypotheses of customer satisfaction in internet pharmacy

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Chapter 3: Research Design

3.1 Variable measurement

Based on the analysis in the previous chapter, it is assumed that a customer satisfaction evaluation model for Internet pharmacies has been set up. However, the latent variables of this model cannot be directly measured. These indicators, known as observed variables, require a multidimensional measure of their latent constructs. The selection of measurement indicators is mainly based on the accurate understanding of the connotation of the structural variables and the resolution of difficulties in obtaining actual research data.

In other words, the measurement indicators should organically combine theoretical positioning with actual research. In fact, the process of selecting measurement variables is the establishment of an indicator system. In this study, after thoroughly reviewing the literature and considering the unique characteristics of online pharmacies as well as their differences from traditional brick-and-mortar shopping and pharmacy sales, the study draws on the ideas of classical customer satisfaction evaluation models both domestically and internationally. Based on the selection of latent variables in various processes, an observed variable model for evaluating customer satisfaction in online pharmacies is established.

3.1.1 Corporate image

There is no unified evaluation criterion among scholars regarding how to divide various dimensions of pharmaceutical e-commerce brand image. This study integrates the viewpoints of various experts and scholars. For pharmaceutical internet retail enterprises, especially for the specific internet retail entities such as e-commerce platforms, trust is considered an important measure for evaluating corporate image. Therefore, based on experience, five indicators are selected related to trust: integrity level, product trust level, service trust level, personal information security, and payment security. Additionally, the high praise from consumers for the brand of pharmaceutical e-commerce enterprises can also serve as a routine observation indicator. Honor is also commonly used in other evaluation scenarios (Y. Sun, 2010).

3.1.2 Customer expectations

Referring to previous classic customer satisfaction index models, this study selects the customer expectations variable and chooses product quality expectations and service quality expectations as observed variables.

3.1.3 Quality perception

Perception of quality includes four dimensions: product quality perception, service quality perception, perception of pharmaceutical expertise, and logistics experience.

a. Perception of product quality

Perception of product quality is a significant component of quality perception. Since the products of online pharmacies are pharmaceuticals subject to strict national regulations, they also adhere to stringent consistency. Non-professional customers generally assess the quality of medications based on packaging, certificates of assurance, and well-established brand names. Therefore, this study selects the quality standards of medications, quality assurance of medications, and variety of medication brands as observed variables.

b. Perception of service quality

The services provided by online pharmacies are conducted online, and the spatial distance distinguishes their service approach from traditional pharmacies. Firstly, the timeliness of service directly affects customer shopping experience and satisfaction. Secondly, e-commerce platforms often prioritize the convenience and diversity of payment methods (H. P. Wang, 2008). Additionally, customers often have diverse medical conditions and high expectations for personalized service. Differentiating between loyal and new customers is also a characteristic of e-commerce. Hence, this study focuses on observing five observed variables: personalized service, payment methods, service response speed, return service, and service for loyal customers.

c. Perception of pharmaceutical expertise

This study fully acknowledges the distinct nature of pharmaceutical e-commerce. Customers' expectations for pharmaceutical expertise and information differ from those for everyday goods. Customers may anticipate comprehensive information and knowledge about medications from online pharmacies. When uncertain, they might repeatedly seek guidance and assistance from customer service and medical professionals. Thus, considering the operational characteristics of online pharmacies, this study selects five observed variables: description of pharmaceutical expertise in products, pre-sale pharmaceutical expertise service,

after-sale pharmaceutical expertise service, accessibility to specialized medications, and professional medical services.

d. Logistics experience

There is a substantial body of literature concerning logistics experience (A. W. Wang, 2020; G. Wu et al., 2019; Y. Zhou, 2019). Building on previous research, this study chooses logistics delivery quality and logistics delivery speed as observed variables.

3.1.4 Value perception

Perception of value is divided into two aspects: perception of service value and perception of product value. Based on the preceding analysis, this study refers to the classic models of customer satisfaction evaluation. It employs two observed variables: the perception of quality/service at a given price and the perception of price at a given quality/service. These variables assess customers' perception of value when purchasing medications online. Additionally, recognizing the extreme convenience of comparing similar products on different e-commerce platforms, customers tend to compare options before making a purchase. Therefore, this study introduces variables for comparing with other websites and comparing with physical pharmacies.

3.1.5 Customer satisfaction

The ACSI and ECSI models, in their selection of observed variables for measuring customer satisfaction, respectively focus on overall satisfaction, the gap between actual perception and customer expectations, and the comparison between actual quality and ideal quality perception (W. Z. Zhou, 2011). The CCSI model adds a measurement: comparing the same competitive goods (Qing, 2003).

It is believed that due to the diversification of products among competitors within the industry, the results of comparing different categories of products for the same customer would naturally differ significantly. Additionally, on online shopping platforms, pharmaceutical products possess a high level of specialization, leading customers to have entirely different understandings of specific products or services, making comparability challenging.

Moreover, since pharmaceutical products are highly standardized goods, whereas services vary greatly based on differing levels of professionalism and service quality, this study designs four observed variables in the online pharmacy customer satisfaction model: overall

service quality, overall product quality, overall satisfaction, and the gap between expectations and actual experiences. These variables aim to assess the level of customer satisfaction for online pharmacy customers.

3.1.6 Customer loyalty

The ACSI model employs two latent observed variables, likelihood of repeat purchase and price retention, to measure potential changes in customer loyalty. The ECSI model uses three observed variables to measure potential changes in customer loyalty: likelihood of repeat purchase, likelihood of purchasing other products/services, and likelihood of recommending to friends. Therefore, this study, following the variable design of classic customer satisfaction models and considering the practical requirements of online pharmacy sales, decides to use probability of repeat purchase and probability of recommendation as two observed variables to measure customer loyalty.

Table 3.1 Summary of secondary variables for internet pharmacies

Level 1 variable	Level 2 variable	Serial number
Corporate image	degree of honesty	CI1
	Product trust level	CI2
	Level of trust in services	CI3
	Personal Information Security	CI4
	Payment Security	CI5
	Corporate Brand Evaluation	CI6
	Enterprise brand honor	CI7
	Good Manufacturing Practice	PQ1
	Pharmaceutical quality assurance	PQ2
	Type of drug brand	PQ3
Quality perception	Service Personalization	SQ1
	terms of payment	SQ2
	Service response time	SQ3
	Returns Service	SQ4
	Repeat Customer Service	SQ5
	Description of Product Pharmaceutical Expertise	MS1
	Pre-sales pharmaceutical professional services	MS2
	After-sales medical professional services	MS3
	Access to new and specialty drugs	MS4
	Specialized physician services	MS5
Value perception	Quality of logistics and distribution	LP1
	Speed of logistics and distribution	LP2
	Quality perception at a given price	VL1
	Perceived price at a given quality	VL2
	Perceived service at a given price	VL3
	Perceived price under established services	VL4
	Comparison with brick-and-mortar pharmacies	VL5

	Comparison with other websites	VL6
Customer expectation	Expectations of the quality of goods	EX1
	Expectations of service quality	EX2
	Overall commodity quality assessment	CS1
Customer satisfaction	Overall quality of service evaluation	CS2
	Overall satisfaction rating	CS3
	Gap between expectations and actual feelings	CS4
Customer loyalty	Possibility of repeat online pharmacy shopping	LO1
	Possibility of recommending others to make online pharmacy purchases	LO2

3.2 Introduction to Jianke.com, the research target company

Founded in 2009 in Guangzhou, Jianke.com Online Pharmacy has developed into a leading internet-based pharmaceutical and health service platform in China after over a decade of growth. It stands as a major player in the domestic internet pharmacy industry, known for its comprehensive drug offerings and broad patient service coverage. Jianke.com is recognized as one of the largest online pharmacies in the country and has gained the Internet Drug Trading Service Qualification Certificate, making it the first legal B2C internet pharmaceutical business in Guangdong. The company currently hosts over 300,000 registered doctors, serves more than 100 million patients with chronic diseases, and receives over 300,000 consultations daily.

In 2016, it secured a 100 million USD Series A financing, followed by a 50 million USD Series A+ financing in 2017, and a 130 million USD Series B financing in 2018. It was ranked as the top unicorn enterprise in the pharmaceutical e-commerce industry by iResearch in 2016 and took the top spot in the pharmaceutical e-commerce category of the 2018 E-commerce Classification Rankings published by the Internet Weekly under the Chinese Academy of Sciences and the eNet Research Institute. According to data from Analysys, Jianke.com's Online Pharmacy consistently leads the nation in terms of monthly active users in 2020.

Over the years, the company has garnered numerous accolades such as One of the Largest Online Pharmacies in China, Top Ten Online Pharmacies in China, Top Fifty Pharmacies of Value in China, Branded Online Pharmacy, One of the Most Popular Online Pharmacies, China's Medical E-commerce Innovation Award, Top Ten Online Pharmacies Gold Shopping Cart, Most Influential Medical E-commerce Brand, and Most Valuable Medical E-commerce Enterprise. Presently, the platform serves more than 100 million users. Its online pharmacy,

Jianke.com, boasts a comprehensive selection of products and is dedicated to providing professional, high-quality, and convenient online pharmaceutical purchasing services.

3.3 Feasibility

This thesis plans to base the study on the Chinese Customer Satisfaction Index (CCSI) model, focusing on nine aspects: corporate image, perception of product quality, perception of service quality, perception of pharmaceutical expertise, logistics experience, customer expectations, perception of value, customer satisfaction, and customer loyalty. Through a questionnaire survey, this study aims to analyze the factors influencing customer satisfaction and develop the most suitable customer satisfaction evaluation model for internet pharmacies.

Based on the research results, Jianke.com Online Pharmacy can be used as the empirical object of study. Through this analysis, the key factors that significantly impact customer satisfaction in internet pharmacies can be identified. Subsequently, this study can propose an evaluation model to provide a basis for enhancing platform customer satisfaction and ultimately improving business performance.

3.3.1 Feasibility of empirical study on Jianke.com Online Pharmacy

Jianke.com Online Pharmacy has been in operation for a decade as an internet-based pharmaceutical platform and is one of the earliest pioneers in the Chinese internet pharmacy industry. We have previously conducted multiple analyses and assessments of its operations, services, and related data, which have provided a strong foundation for this study. Jianke.com Online Pharmacy has granted researchers authorization to analyze and utilize a portion of their operational data for research purposes. As a result, utilizing Jianke.com Online Pharmacy as the empirical subject for studying customer satisfaction within the context of the internet pharmacy ecosystem is indeed feasible.

3.3.2 Feasibility of the research method

This study plans to adopt a research methodology that combines literature review and questionnaire surveys. It will begin by comprehensively understanding relevant theories and research status on online customer satisfaction through literature review. Building on this foundation, the study will propose a research framework and construct a causal relationship theoretical model for online customer satisfaction. Subsequently, data will be collected

through online questionnaires, and various quantitative analysis methods will be employed, including exploratory factor analysis, confirmatory factor analysis, and SEM, to validate the relationships in the proposed model. The research team is knowledgeable and experienced in the relevant methods, making the chosen research methodology feasible.

3.3.3 Quantification of evaluation indicators

The core of measuring customer satisfaction lies in quantifying latent variables that cannot be directly measured, using numbers to reflect customers' attitudes toward intermediary service satisfaction. This approach is common in quantitative analysis. Commonly used scales fall into two categories: evaluative scales and attitudinal scales. Among attitudinal scales, the Likert scale is the most frequently used (Likert, 1932). Respondents evaluate their attitudes using agree/disagree options, providing an intuitive and convenient method of response. Therefore, a modified Likert scale survey will be used for the study, where respondents' attitudes are categorized into five levels ("Strongly Disagree," "Disagree," "Neutral," "Agree," "Strongly Agree"), and corresponding scores are assigned. Respondents will rate their experiences and feelings during the online shopping process based on various questions.

3.4 Sample and data collection

In the previous sections, this thesis analyzed the literature basis and indicator selection for constructing the customer satisfaction index system. In this section, based on the indicator system, this thesis will collect and organize data through a questionnaire survey.

3.4.1 Design of the survey questionnaire

The questionnaire survey method is a research technique where information or opinions are obtained from respondents through a standardized questionnaire. For this research, after reviewing a significant amount of relevant literature and deeply studying the importance of online shopping for goods, combined with the author's industry experience and extensive interviews with experts and individuals experienced in online shopping, a detailed and well-structured questionnaire has been developed. To ensure the clarity of each topic, the correct usage of terminology, and the accuracy of each question in measuring the intended concepts, a pre-survey was conducted to understand respondents' understanding of each question. The questionnaire was modified multiple times based on their feedback, leading to the final

version of the questionnaire (see Annex B).

The questionnaire consists of three main parts: the first part describes the questionnaire content and provides instructions, the second part involves surveying the respondents about their experiences and feelings while shopping on Jianke.com Online Pharmacy, and the third part collects personal information of respondents, including gender, age, occupation, education level, frequency of online shopping, income status. The questionnaire mainly employs a multiple-choice format for respondents to answer. The questionnaire was distributed and collected through a convenient third-party online survey service company.

3.4.2 Implementation of the questionnaire survey

This thesis primarily collected customer data and satisfaction feedback through a questionnaire survey, with the following specific steps:

1) Sample selection

The target sample for this study consists of users who have successfully registered on Jianke.com Online Pharmacy within the past two years, including all customers who have placed successful orders. The proportion of new and existing customers is 1:1.

2) Data collection

Structured data collection was primarily conducted through distributing and completing questionnaires. The questionnaire was in the form of an online survey, distributed over the internet. Customers who answered the questionnaire were rewarded with coupons to incentivize participation. Online surveys significantly reduced survey workload, cost, and facilitated rapid data collection. The questionnaires were distributed to selected Jianke.com Online Pharmacy users through the “Questionnaire Star” platform (www.wjx.cn). After users completed the questionnaire, the platform collected the relevant responses, which were then subjected to further statistical analysis.

3.5 Data analysis

The methods used for statistical analysis are primarily quantitative methods, including structural equation model (SEM) and relevant statistical testing tools.

3.5.1 Structural equation model

Structural equation modeling (SEM) is a suitable method for this study due to its applicability

to situations involving multiple independent and dependent variables. This model is particularly well-suited for situations where data is collected through questionnaire surveys. Through the utilization of two fundamental statistical quantitative analysis methods, factor analysis and path analysis, complex data is statistically analyzed to build a model. This theory has been widely applied in research. It consists of two models and three basic equations: the structural model and the measurement model. The structural model has an equation that represents endogenous latent variables with exogenous latent variables, referred to as the structural equation.

The measurement model consists of two parts: the measurement equation, which expresses observed variables based on latent variables and describes the relationship between observed variables and latent variables, and the structural equation, which describes the relationship between latent variables. Overall, due to the interest in the interaction between latent variables, i.e., the structural model, this thesis refers to the entire statistical analysis as SEM (W. Z. Zhou, 2011).

3.5.2 Statistical analysis tools

In this study, SPSS 22 and Amos 20 statistical software tools are primarily used for statistical analysis. SPSS 22 is used for tests of reliability, Kaiser-Meyer-Olkin (KMO) test, Bartlett's test, and exploratory factor analysis (EFA). Amos 20 is utilized for conducting confirmatory factor analysis and path relationship analysis for the proposed theoretical model. It is also employed to assess the fit and reliability of the SEM model.

3.6 Scale modification

This study adjusted and modified the initial survey questionnaire by referencing mature scales from abroad and integrating characteristics of online pharmacies. An initial survey questionnaire was formed, and a pre-survey was conducted to examine and adjust the initial questionnaire. This process resulted in the final version of the survey questionnaire.

3.6.1 Pre-survey sample overview

A total of 503 questionnaires were collected in the pre-survey phase. Among them, 227 questionnaires were excluded due to significant errors or contradictory answers. The final number of valid questionnaires was 276.

3.6.2 Internal consistency of the scale

The reliability analysis of a scale is often performed to assess its internal consistency. Internal consistency reflects the degree of consistency among the scores obtained from various measurement items within the scale of the survey questionnaire. Data obtained from scientifically sound survey questionnaires should exhibit good consistency, reliability, and stability (J. Zhang, 2013). The most commonly used indicator for evaluating internal consistency of a scale, particularly for Likert scales, is the Cronbach's α coefficient.

In this study, the survey was conducted using a one-time measurement through simple random sampling. The survey questionnaire aimed to capture attitudes, opinions, and perceptions of the respondents using Likert scale questions. Therefore, the Cronbach's α coefficient method can be used to examine the internal consistency of the scale. SPSS 22 was employed in this study to calculate the Cronbach's α coefficient. The values of Cronbach's α coefficient range from 0 to 1, with values closer to 1 indicating higher internal consistency reliability. Generally, a reliability coefficient of 0.7 is considered acceptable, while exceeding 0.8 represents a higher level of reliability.

1) Corporate image

As shown in Table 3.2, the mean values of the seven measurement items for corporate image range from 4.06 to 4.56, and the standard deviations range from 0.56 to 0.84. The corrected item-total correlation (CITC) for the CI7 item is 0.576, which is notably lower than the CITC values of the other six measurement items. After removing this measurement item, the Cronbach's α coefficient increases to 0.933, indicating an improvement in the internal consistency of the corporate image scale. The CI7 item is therefore removed based on deletion criteria. After the removal of the CI7 item, the internal consistency of the corporate image scale becomes higher.

Table 3.2 Internal consistency analysis of corporate image

Item	Mean	Standard deviation	CITC	Cronbach's coefficient item deletion	alpha after	Cronbach's alpha coefficient
CI1	4.49	0.59	0.802	0.902		0.927
CI2	4.52	0.60	0.795	0.902		
CI3	4.54	0.63	0.817	0.899		
CI4	4.48	0.61	0.799	0.902		
CI5	4.56	0.56	0.792	0.903		
CI6	4.46	0.65	0.772	0.904		
CI7	4.06	0.84	0.576	0.933		

2) Customer expectations

As indicated in Table A.3 (in Annex A), the mean values of the two measurement items

for customer expectations range from 4.11 to 4.18, and the standard deviations range from 0.75 to 0.76. The CITC values for both of these measurement items exceed 0.6. Since there are only two measurement items for this construct, analyzing the Cronbach's α coefficient after removing individual items would not yield meaningful results. The Cronbach's α coefficient for customer expectations is 0.874, indicating a high level of internal consistency.

3) Quality perception

As shown in Table A.4 (in Annex A), the mean values of the 15 measurement items for quality perception range from 4.10 to 4.47, and the standard deviations range from 0.64 to 0.88. The CITC values for all 15 measurement items are above 0.6. Additionally, removing any individual measurement item from the construct does not result in an increase in the Cronbach's α coefficient. Therefore, all 15 measurement items should be retained in this construct. The Cronbach's α coefficient for quality perception is 0.963, indicating a high level of internal consistency.

4) Value perception

From Table 3.3, it can be observed that the mean values of the six measurement items for value perception range from 3.81 to 4.24, and the standard deviations range from 0.72 to 0.96. The CITC values for all six measurement items are above 0.6. However, upon removing VL4 item, the Cronbach's α coefficient increases. Therefore, the VL4 item is removed. After removing the VL4 item, the Cronbach's α coefficient for value perception is 0.945, indicating a high level of internal consistency.

Table 3.3 Internal consistency analysis of value perception

Item	Mmean	Standard deviation	CITC	Cronbach's alpha coefficient after item deletion	Cronbach's alpha coefficient
VL1	4.19	0.74	0.820	0.917	0.938
VL2	4.24	0.72	0.812	0.918	
VL3	4.14	0.72	0.871	0.911	
VL4	3.81	0.96	0.658	0.945	
VL5	4.06	0.80	0.844	0.913	
VL6	4.14	0.73	0.864	0.912	

5) Customer satisfaction

From Table A.5 (in Annex A), it can be observed that the mean values of the four measurement items for customer satisfaction range from 4.25 to 4.30, and the standard deviations range from 0.67 to 0.71. The CITC values for all four measurement items are above 0.6. Moreover, removing any of the measurement items would not lead to an increase in the Cronbach's α coefficient. Therefore, all four measurement items are retained in the

scale for customer satisfaction. The Cronbach's α coefficient for customer satisfaction is 0.953, indicating a high level of internal consistency.

6) Customer loyalty

From Table A.6 (in Annex A), it is evident that the mean values of the two measurement items for customer loyalty range from 4.22 to 4.33, with standard deviations ranging from 0.60 to 0.69. The CITC values for both measurement items are above 0.6. Since there are only two measurement items, analyzing the Cronbach's α coefficient after item deletion is not meaningful, and therefore, this analysis is not performed for this case. The Cronbach's α coefficient for customer loyalty is 0.818, indicating a high level of internal consistency.

As shown above, the Cronbach's α coefficients for all six latent variables are greater than 0.8. Moreover, after the modification of measurement scales in this study, which includes a total of 34 measurement items, the overall Cronbach's α coefficient is 0.981, indicating excellent internal consistency.

3.6.3 Preliminary confirmatory factor analysis

Factor analysis is a commonly used method for assessing the validity of measurement scales. It includes exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). EFA is suitable for use in the initial stages of scale development, while CFA is appropriate for cases where the scale is already developed. Since this study's measurement scales are mainly based on existing scales, this thesis conducted a preliminary Confirmatory Factor Analysis using the data from the pre-survey sample to validate the modified scales.

Firstly, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were performed using SPSS 22 statistical software to assess whether factor analysis is appropriate. The KMO statistic ranges from 0 to 1. A higher KMO value indicates stronger correlations between items and is more suitable for factor analysis. According to Kaiser and Rice's criterion proposed in 1974, a KMO value less than 0.5 indicates that the items are not suitable for factor analysis; a KMO value greater than 0.6 is the minimum requirement for factor analysis; KMO values between 0.7 and 0.8 are generally suitable for factor analysis; KMO values between 0.8 and 0.9 suggest items are relatively suitable for factor analysis; when KMO is above 0.9, the items are highly suitable for factor analysis. Bartlett's test of sphericity is used to test the correlation between items. When the approximate Chi-square is large and the p-value is very small (<0.01), it is suitable for factor analysis.

Table 3.4 presents the results of the KMO and Bartlett's test of sphericity for all latent

variables. From Table 3.4, it can be observed that except for the latent variables “customer expectation” and “customer loyalty,” which have only two measurement items and a KMO value of 0.5, the KMO values for the other four latent variables (enterprise image, quality perception, value perception, and customer satisfaction) are all greater than 0.7. Additionally, the p-values from Bartlett’s test of sphericity for these four latent variables are all less than 0.001, indicating the suitability of these latent variables for factor analysis.

Table 3.4 KMO and Bartlett’s test of sphericity

Variable	KMO	Bartlett test of sphericity		
		Approximate Chi-square	(number of) degrees of freedom	P
Corporate image	0.922	1275.218	15	<0.001
Customer expectation	0.500	251.861	1	<0.001
Quality perception	0.950	3919.370	105	<0.001
Value perception	0.881	1308.667	10	<0.001
Customer satisfaction	0.861	1157.328	6	<0.001
Customer loyalty	0.500	178.711	1	<0.001

The next step involves conducting a preliminary confirmatory factor analysis using Amos 20 statistical software. The results of the preliminary confirmatory factor analysis for the four latent variable scales are presented in Table 3.5.

Table 3.5 Preliminary validation factor analysis results

Variable	Item	Factor loading	P	CR	AVE
Corporate image	CI1	0.844		0.934	0.703
	CI2	0.829	<0.001		
	CI3	0.882	<0.001		
	CI4	0.837	<0.001		
	CI5	0.831	<0.001		
	CI6	0.807	<0.001		
Quality perception	PQ1	0.776		0.963	0.638
	PQ2	0.733	<0.001		
	PQ3	0.767	<0.001		
	SQ1	0.851	<0.001		
	SQ2	0.784	<0.001		
	SQ3	0.83	<0.001		
	SQ4	0.841	<0.001		
	SQ5	0.755	<0.001		
	MS1	0.85	<0.001		
	MS2	0.837	<0.001		
	MS3	0.888	<0.001		
	MS4	0.844	<0.001		
Value perception	MS5	0.851	<0.001		
	LP1	0.683	<0.001		
	LP2	0.649	<0.001		
	VL1	0.878		0.946	0.777
	VL2	0.889	<0.001		
	VL3	0.902	<0.001		
Customer	VL5	0.844	<0.001		
	VL6	0.893	<0.001		
	CS1	0.901		0.954	0.837

satisfaction	CS2	0.917	<0.001
	CS3	0.922	<0.001
	CS4	0.919	<0.001

From Table 3.5, it is evident that the factor loading coefficients for the measurement items corresponding to the four latent variables: corporate image, quality perception, value perception, and customer satisfaction, are all greater than 0.6, with all p-values being less than 0.001. The composite reliability (CR) values for these four latent variables are all above 0.9, surpassing the recommended threshold of 0.7. Additionally, the average variance extracted (AVE) values are all above 0.6, exceeding the recommended threshold of 0.5. The results of the preliminary CFA indicate that the revised measurement scales possess strong construct validity and can be utilized for subsequent research and statistical analysis.

3.6.4 Common method bias test

If common method bias is present, a single factor can explain most of the common variance among the measured variables. This study employs the Harman's single-factor test to examine the existence of common method bias. Table 3.6 presents the results of exploratory factor analysis with eigenvalues greater than 1 before rotation. There are four factors with eigenvalues greater than 1 before rotation. Among them, the factor with the highest eigenvalue accounts for 37.01% of the variance, which is less than 40%. Therefore, this study's data collection is not affected by common method bias issues.

Table 3.6 Results of Harman's one-way test

Ingredient	Characteristic root	Percentage of variance	Cumulative %
1	12.584	37.01%	37.01%
2	6.305	18.54%	55.56%
3	5.142	15.12%	70.68%
4	1.278	3.76%	74.44%

Chapter 4: Research Results

Based on the pre-survey, a large-scale survey was conducted, receiving a total of 3,660 questionnaires. Among them, 1,872 questionnaires were excluded due to clear errors or contradictory responses. Ultimately, 1,788 valid questionnaires were retained. This chapter begins with a descriptive statistical analysis of the basic characteristics of the large sample, providing an initial understanding of the online pharmacy user population under investigation. Subsequently, utilizing the collected sample data, this thesis conducted empirical research to validate the theoretical model and research hypotheses proposed in this study.

The validation of the conceptual model and research hypotheses in this chapter is divided into three stages. The first stage involves examining the reliability and validity of the scales for the core variables in the conceptual model. The second stage includes descriptive statistics and a preliminary investigation of the relationships among these core variables. The third stage focuses on testing the conceptual model and research hypotheses.

4.1 Basic characteristics of the sample

In this study, frequency analysis was conducted on the basic information of the respondents, including gender, age, marital status, education level, monthly income, and place of residence. The analysis results are presented in Table 4.1.

Table 4.1 Basic Characteristics of the sample

Basic Information	Category	Frequency	Proportion
Gender	Male	1525	85.3%
	Female	263	14.7%
Age	Below 18	2	0.1%
	18~25	25	1.4%
	26~30	22	1.2%
	31~40	150	8.4%
	41~50	487	27.2%
	51~60	714	39.9%
	Above 60	388	21.7%
	Single	92	5.1%
Marriage Status	Married	1590	88.9%
	Divorced	74	4.1%
	Losing a spouse	32	1.8%
Education	Below middle school	723	40.4%
	Junior college	683	38.2%
	Bachelor's degree	345	19.3%

Monthly income		Above master's degree	37	2.1%
		Below 3000	424	23.7%
		3001~5000	595	33.3%
		5001~8000	515	28.8%
		8001~15000	192	10.7%
		15001~30000	45	2.5%
		Above 30001	17	1.0%
Place of residence	of	Urban	1176	65.8%
		Rural	612	34.2%

From Table 4.1, it can be observed that male respondents account for 85.3% of the total, while female respondents make up 14.7%. The number of male respondents exceeds that of female respondents, aligning with the gender distribution of online pharmacy users.

Among the respondents, those below 18 years old account for 0.1%, those aged between 18 and 25 comprise 1.4%, those between 26 and 30 make up 1.2%, those aged between 31 and 40 constitute 8.4%, those aged between 41 and 50 account for 27.2%, those aged between 51 and 60 make up 39.9%, and those above 60 years old represent 21.7%. The data indicates that the primary user group of online pharmacies is relatively older, mainly composed of middle-aged and elderly individuals. As age increases, organ functions gradually decline, leading to various health issues that require medication for maintaining well-being.

Regarding education level, 19.3% of respondents hold a bachelor's degree, 2.1% have a graduate or higher degree, and the majority have either a high school education (40.4%) or a diploma from senior college (38.2%).

In terms of income, the largest proportion of respondents falls into the monthly income range of RMB 3,001 to 5,000, accounting for 33.3%. The next most significant income group is the one earning between RMB 5,001 and 8,000 per month, comprising 28.8% of the respondents. Those with a monthly income of RMB 3,000 or less constitute 23.7%, while those earning between RMB 8,001 and 15,000 per month account for 10.7%. Only 3.5% of respondents have a monthly income exceeding RMB 15,000.

Regarding residence, 65.8% of respondents live in urban areas, while 34.2% reside in rural towns. From the data analysis, it can be concluded that the primary demographic group participating in B2C model online pharmaceutical shopping consists of middle-aged and elderly individuals residing in urban areas, possessing the financial means to purchase products or services offered by B2C e-commerce websites specializing in pharmaceuticals. Additionally, males are the main consumers of pharmaceutical products in the B2C model.

4.2 Reliability and validity analysis of the questionnaire

4.2.1 Reliability analysis

Reliability refers to the consistency of questionnaire data, or in other words, the consistency of results obtained when the same object is repeatedly measured using the same method. Reliability is generally represented by three coefficient indicators: equivalence coefficient (consistency across forms), stability coefficient (consistency over time), and internal consistency coefficient (consistency across items) (J. Zhang, 2013).

The equivalence coefficient involves conducting repeated surveys on the same research subjects, requiring respondents to fill out two identical questionnaires except for differences in question wording, and then calculating the correlation coefficient between the results obtained from these two questionnaires. The stability coefficient measures the consistency between two measurements taken at different times on the same group of respondents using the same questionnaire. The internal consistency coefficient primarily reflects the degree of consistency among the scores of various measurement items in the questionnaire. Data obtained from scientifically sound questionnaires should exhibit good consistency, reliability, and stability (J. Zhang, 2013).

In general, there are four common methods for conducting reliability analysis: test-retest reliability, split-half reliability, retest reliability, and Cronbach's α reliability coefficient. Cronbach's α reliability coefficient is the most commonly used indicator for evaluating the internal consistency of Likert-type scale questionnaires. In this study, questionnaires were administered using a simple random sampling method, and the questionnaires aimed to measure the attitudes, opinions, and perceptions of the respondents. Therefore, Cronbach's α reliability coefficient was employed to assess the reliability of the questionnaire. SPSS 22 statistical software was used to calculate Cronbach's α coefficient. The value of Cronbach's α coefficient falls between 0 and 1, with values closer to 1 indicating higher internal consistency reliability. Generally, a reliability coefficient reaching 0.7 is considered acceptable, while values exceeding 0.8 are indicative of high reliability.

The reliability analysis results for the variables investigated in this study are presented in Table 4.2. From Table 4.2, it can be observed that the Cronbach's α reliability coefficients for individual latent variables are all above 0.8. Furthermore, the deletion of any measurement item does not increase the Cronbach's α coefficient. Additionally, the overall Cronbach's α coefficient for the revised questionnaire, which includes 34 measurement items, is 0.981,

indicating excellent representational capacity and affirming the high reliability of the questionnaire in this study.

Table 4.2 Results of reliability tests

Variable	Item	Cronbach's α with removal of items	Cronbach's α
Corporate image	CI1	0.925	0.939
	CI2	0.925	
	CI3	0.923	
	CI4	0.928	
	CI5	0.927	
	CI6	0.936	
Customer expectation	EX1	-	0.882
	EX2	-	
Quality perception	PQ1	0.959	0.962
	PQ2	0.960	
	PQ3	0.958	
	SQ1	0.957	
	SQ2	0.959	
	SQ3	0.957	
	SQ4	0.958	
	SQ5	0.958	
	MS1	0.957	
	MS2	0.957	
	MS3	0.956	
	MS4	0.958	
	MS5	0.957	
	LP1	0.959	
	LP2	0.960	
Value perception	VL1	0.918	0.934
	VL2	0.915	
	VL3	0.915	
	VL5	0.927	
	VL6	0.914	
Customer satisfaction	CS1	0.933	0.945
	CS2	0.925	
	CS3	0.921	
	CS4	0.931	
Customer loyalty	LO1	-	0.895
	LO2	-	

4.2.2 Validity analysis

Validity refers to the extent to which a measurement tool or method accurately captures the degree of what it intends to measure. It assesses whether the measurement results truly reflect the intended target and purpose of the measurement. In this study, the validity of the questionnaire was examined using Confirmatory Factor Analysis (CFA). is typically applied to factor analysis of latent variables and is commonly used when there are specific theoretical perspectives or conceptual frameworks underlying the research. In SEM, CFA plays a crucial

role as it is used to test the hypothesized relationships between measurement variables and latent variables. It can also be applied in testing the validity of measurement items and evaluating theoretical validity. Additionally, as a submodel within SEM, CFA can be combined with other submodels to form a comprehensive SEM analysis.

Before conducting Confirmatory Factor Analysis, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Sphericity test were performed using SPSS 22 statistical software to determine whether factor analysis was appropriate for the large sample. Table 4.3 displays the results of the KMO and Bartlett's Sphericity tests for all latent variables. From Table 4.3, it can be observed that, except for the latent variables of Customer Expectations and Customer Loyalty, which have only two measurement items and exhibit a KMO value of 0.5, the KMO values for the other four latent variables (Corporate Image, Quality perception, Value perception, and Customer Satisfaction) are all greater than 0.7. Moreover, the p-values for Bartlett's Sphericity test for these latent variables are all less than 0.001, indicating that the scales for these latent variables are suitable for factor analysis.

Table 4.3 KMO and Bartlett's Sphericity test

Variable	KMO	Bartlett test of sphericity		
		Chi-square	Degree of freedom	P
Corporate image	0.922	8983.112	15	<0.001
Customer expectation	0.500	1736.123	1	<0.001
Quality perception	0.966	23611.913	105	<0.001
Value perception	0.880	7483.508	10	<0.001
Customer satisfaction	0.864	6793.413	6	<0.001
Customer loyalty	0.500	1903.497	1	<0.001

Next, a CFA was conducted using Amos 20 statistical software. The results of the CFA for the scales of the four latent variables were presented in Table 4.4.

Table 4.4 CFA results

Variable	Item	Factor loading	P	CR	AVE
Corporate image	CI1	0.866		0.94	0.722
	CI2	0.867	<0.001		
	CI3	0.884	<0.001		
	CI4	0.84	<0.001		
	CI5	0.846	<0.001		
	CI6	0.794	<0.001		
Quality perception	PQ1	0.763		0.962	0.631
	PQ2	0.713	<0.001		
	PQ3	0.754	<0.001		
	SQ1	0.813	<0.001		
	SQ2	0.759	<0.001		
	SQ3	0.823	<0.001		
	SQ4	0.803	<0.001		
	SQ5	0.784	<0.001		
	MS1	0.858	<0.001		

	MS2	0.872	<0.001		
	MS3	0.881	<0.001		
	MS4	0.795	<0.001		
	MS5	0.861	<0.001		
	LP1	0.708	<0.001		
	LP2	0.692	<0.001		
	VL1	0.874		0.934	0.739
	VL2	0.889	<0.001		
	VL3	0.867	<0.001		
	VL5	0.806	<0.001		
	VL6	0.859	<0.001		
	CS1	0.886		0.945	0.811
	CS2	0.905	<0.001		
	CS3	0.918	<0.001		
	CS4	0.893	<0.001		

According to Table 4.4, the factor loading coefficients for all measurement items corresponding to the four latent variables: corporate image, Quality perception, Value perception, and customer satisfaction, are all greater than 0.6, and all p-values are less than 0.001. The Composite Reliability (CR) values for these four latent variables are all above 0.9, exceeding the recommended threshold of 0.7. Additionally, the Average Variance Extracted (AVE) values are all above 0.6, surpassing the suggested threshold of 0.5. The results of the CFA indicate that the survey questionnaire used in this study demonstrates good validity.

4.3 Descriptive statistical analysis

In this study, a descriptive statistical analysis was conducted on the sample data. The analysis included measures such as mean, standard deviation, skewness, and kurtosis. These measures were used to assess the basic characteristics of the questionnaire items and their data distribution. The specific results of the descriptive statistical analysis are presented in Table 4.5.

Table 4.5 Descriptive statistical analysis results

Variable	Item	Mean	Standard Deviation	Skewness	Kurtosis
Corporate image	CI1	4.46	0.65	-1.20	2.58
	CI2	4.47	0.65	-1.15	1.97
	CI3	4.47	0.66	-1.25	2.40
	CI4	4.45	0.65	-1.12	2.06
	CI5	4.51	0.58	-0.98	1.89
	CI6	4.41	0.63	-0.79	0.80
Quality perception	PQ1	4.31	0.69	-0.77	0.92
	PQ2	4.07	0.85	-0.62	-0.04
	PQ3	4.19	0.75	-0.68	0.39
	SQ1	4.23	0.69	-0.59	0.32
	SQ2	4.35	0.60	-0.40	-0.12
	SQ3	4.21	0.73	-0.74	0.76

	SQ4	4.21	0.69	-0.57	0.42
	SQ5	4.12	0.81	-0.65	0.11
	MS1	4.27	0.66	-0.39	-0.58
	MS2	4.23	0.70	-0.49	-0.24
	MS3	4.19	0.70	-0.49	0.00
	MS4	4.08	0.78	-0.50	-0.04
	MS5	4.18	0.72	-0.48	-0.18
	LP1	4.44	0.65	-1.05	1.54
	LP2	4.34	0.74	-1.06	1.35
	VL1	4.16	0.71	-0.36	-0.45
Value perception	VL2	4.20	0.70	-0.55	0.27
	VL3	4.09	0.73	-0.42	-0.06
	VL5	4.06	0.76	-0.42	-0.10
	VL6	4.07	0.74	-0.39	-0.23
Customer expectation	EX1	4.14	0.69	-0.30	-0.40
	EX2	4.16	0.69	-0.34	-0.41
	CS1	4.25	0.66	-0.45	-0.13
Customer satisfaction	CS2	4.25	0.67	-0.54	0.35
	CS3	4.25	0.69	-0.58	0.33
	CS4	4.20	0.70	-0.60	0.50
Customer loyalty	LO1	4.36	0.79	-1.62	3.85
	LO2	4.25	0.87	-1.41	2.55

Skewness and kurtosis values approaching 0 indicate that the data distribution is closer to a normal distribution. The standard criteria for data to be considered approximately normally distributed are an absolute skewness value less than 3 and an absolute kurtosis value less than 8. Table 4.5 shows that the absolute values of skewness and kurtosis for each measurement item meet these two conditions, indicating that the sample data for each item approximately follows a normal distribution.

4.4 Correlation analysis

To test the conceptual model and hypotheses proposed earlier, this thesis initially conducted a correlation analysis among the six latent variables included in the conceptual model: corporate image, customer expectations, Quality perception, Value perception, customer satisfaction, and customer loyalty. Since these six latent variables are all quantitative variables, this study used Pearson's simple correlation coefficient to measure their relationships. This study used SPSS 22 statistical analysis software to analyze the correlations between corporate image, customer expectations, Quality perception, Value perception, customer satisfaction, and customer loyalty, and the results are presented in Table 4.6.

Table 4.6 Correlation analysis results

Variable	Corporate image	Customer expectation	Quality perception	Value perception	Customer satisfaction	Customer loyalty
Corporate image	1					
Customer expectation	0.490**	1				
Quality perception	0.648**	0.634**	1			
Value perception	0.578**	0.638**	0.785**	1		
Customer satisfaction	0.610**	0.642**	0.766**	0.758**	1	
Customer loyalty	0.470**	0.394**	0.507**	0.500**	0.522**	1

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

From Table 4.6, this study can observe that there are significant positive linear correlations between corporate image, customer expectations, Quality perception, Value perception, customer satisfaction, and customer loyalty. The correlation coefficients (r) range from 0.39 to 0.79. Therefore, this study indicates that there are strong associations among the latent variables, and the nature of these relationships aligns with the conceptual model and hypotheses, providing preliminary support for their validity.

4.5 Test of the conceptual model

It is discussed that after completing parameter estimation with maximum likelihood estimation in the SEM pre-specified model, an overall assessment of the SEM is necessary. This assessment evaluates the fit between the hypothesized model and the observed data. Generally, model fit indices are examined to determine how well the theoretical structural model fits the observed data. Fit indices are used to assess the adequacy of the fit between the conceptual model and the observed data, but they are not the sole criteria for judging whether the model is valid. Researchers should also consider the theoretical background of the study when evaluating model fit (Y. Liu, 2016).

Commonly used fit indices include Chi-square, Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Standardized Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI), and Incremental Fit Index (IFI). The criteria and evaluation for each fit index are presented in Table 4.7.

Table 4.7 Model fit indices evaluation

Fit Indices	Criteria	Evaluation
Chi-square	-	P>0.05
GFI	≥0.90	Closer to 1 is better
AGFI	≥0.80	Closer to 1 is better
SRMR	≤0.10	Smaller is better
RMSEA	<0.08	Smaller is better, acceptable in the 0.05-0.08 range
NFI	≥0.90	Closer to 1 is better
NNFI	≥0.90	Closer to 1 is better
CFI	≥0.90	Closer to 1 is better
IFI	≥0.90	Closer to 1 is better

In this study, the SEM was analyzed using Amos 20 statistical software. The initial model's standardized path relationships are depicted in Figure 4.1, and the values of key fit indices are presented in Table 4.8.

Table 4.8 Initial model fit indices values

Fit Indices	Criteria	Evaluation	Model Fit Test Results
Chi-square	-	P>0.05	4823.953 (P<0.01)
GFI	≥0.90	Closer to 1 is better	0.847
AGFI	≥0.80	Closer to 1 is better	0.823
SRMR	≤0.10	Smaller is better	0.038
RMSEA	<0.08	Smaller is better, acceptable in the 0.05-0.08 range	0.068
NFI	≥0.90	Closer to 1 is better	0.933
NNFI	≥0.90	Closer to 1 is better	0.924
CFI	≥0.90	Closer to 1 is better	0.930
IFI	≥0.90	Closer to 1 is better	0.930

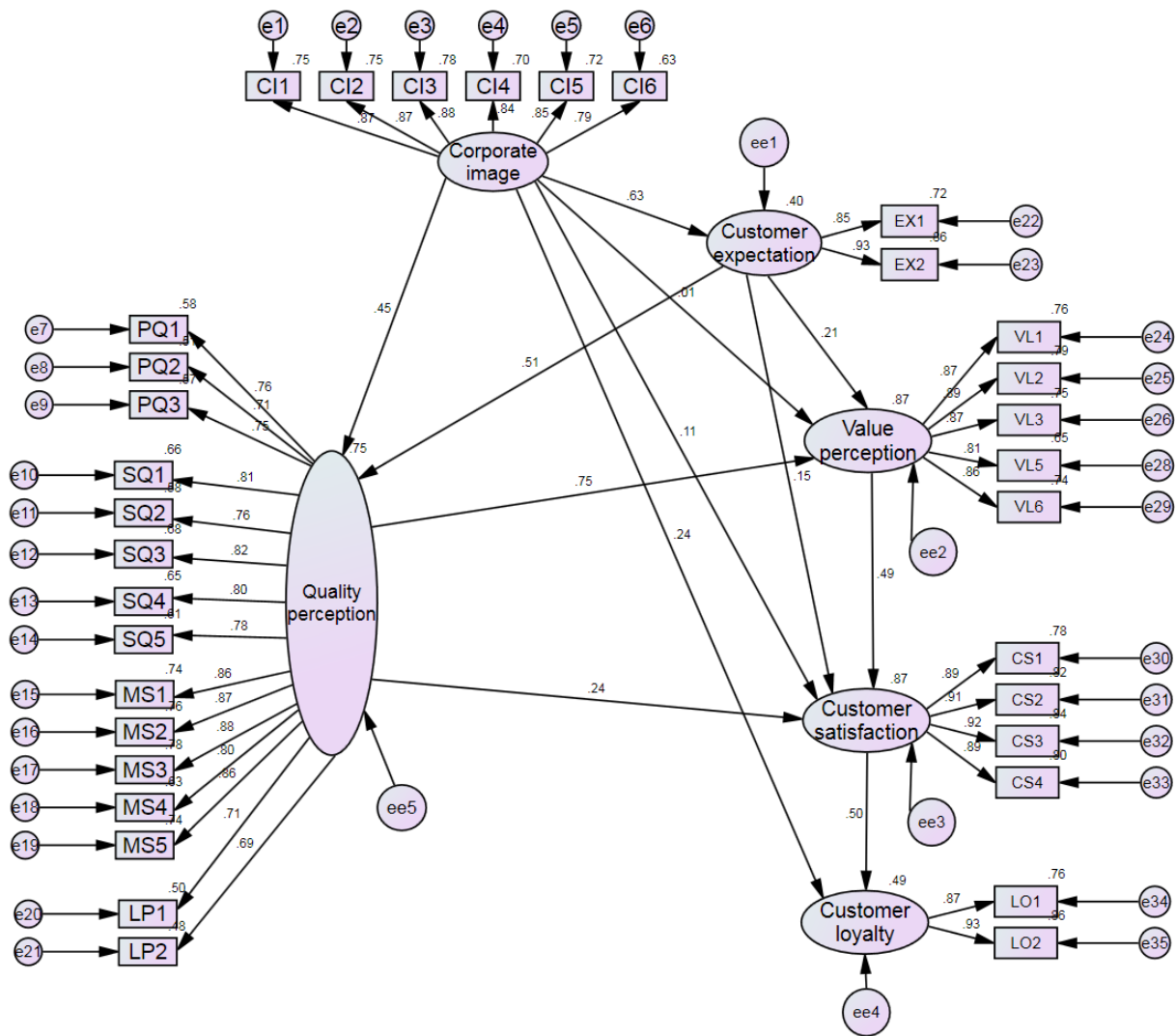


Figure 4.1 Standardized path relationship results diagram for the initial model

From Table 4.8, it can be observed that the chi-square value for the Internet pharmacy customer satisfaction model is significant, with a chi-square value of 4823.953. However, chi-square is sensitive to sample size, and it tends to become significant with larger sample sizes, so chi-square should be considered as a reference index for model evaluation (Wen et al., 2004). The values of other fit indices either meet or are close to the criteria, indicating that the initial SEM generally fits the sample data well, and the overall model fit is acceptable.

The standardized regression coefficients among latent variables in the initial SEM are presented in Table 4.9. From Table 4.9, it is evident that the p-value for the path coefficient from “Value perception” to “corporate image” is significantly greater than 0.05, indicating that it is not statistically significant. After removing this path, the model was re-fitted. The results of the revised model’s standardized path relationships are shown in Figure 4.2, and the fit index values for the revised model are provided in Table 4.10. The standardized regression coefficients among latent variables in the revised model are presented in Table 4.11.

Table 4.9 Standardized regression coefficients between latent variables in the initial model

Path	Estimate	S.E.	C.R.	P
H1a: Quality perception<---Corporate image	0.449	0.021	20.303	<0.001
H1b: Customer expectation<---Corporate image	0.635	0.025	26.013	<0.001
H1c: Value perception<---Corporate image	0.011	0.021	0.575	0.565
H1d: Customer satisfaction<---Corporate image	0.109	0.019	5.887	<0.001
H1e: Customer loyalty<---Corporate image	0.236	0.039	7.495	<0.001
H2a: Quality perception<---Customer expectation	0.507	0.021	21.897	<0.001
H2b: Value perception<---Customer expectation	0.213	0.023	9.693	<0.001
H2c: Customer satisfaction<---Customer expectation	0.15	0.023	6.675	<0.001
H3a: Value perception<---Quality perception	0.746	0.037	24.074	<0.001
H3b: Customer satisfaction<---Quality perception	0.242	0.044	6.129	<0.001
H4: Customer satisfaction<---Value perception	0.493	0.038	12.311	<0.001
H5: Customer loyalty<---Customer satisfaction	0.504	0.038	15.55	<0.001

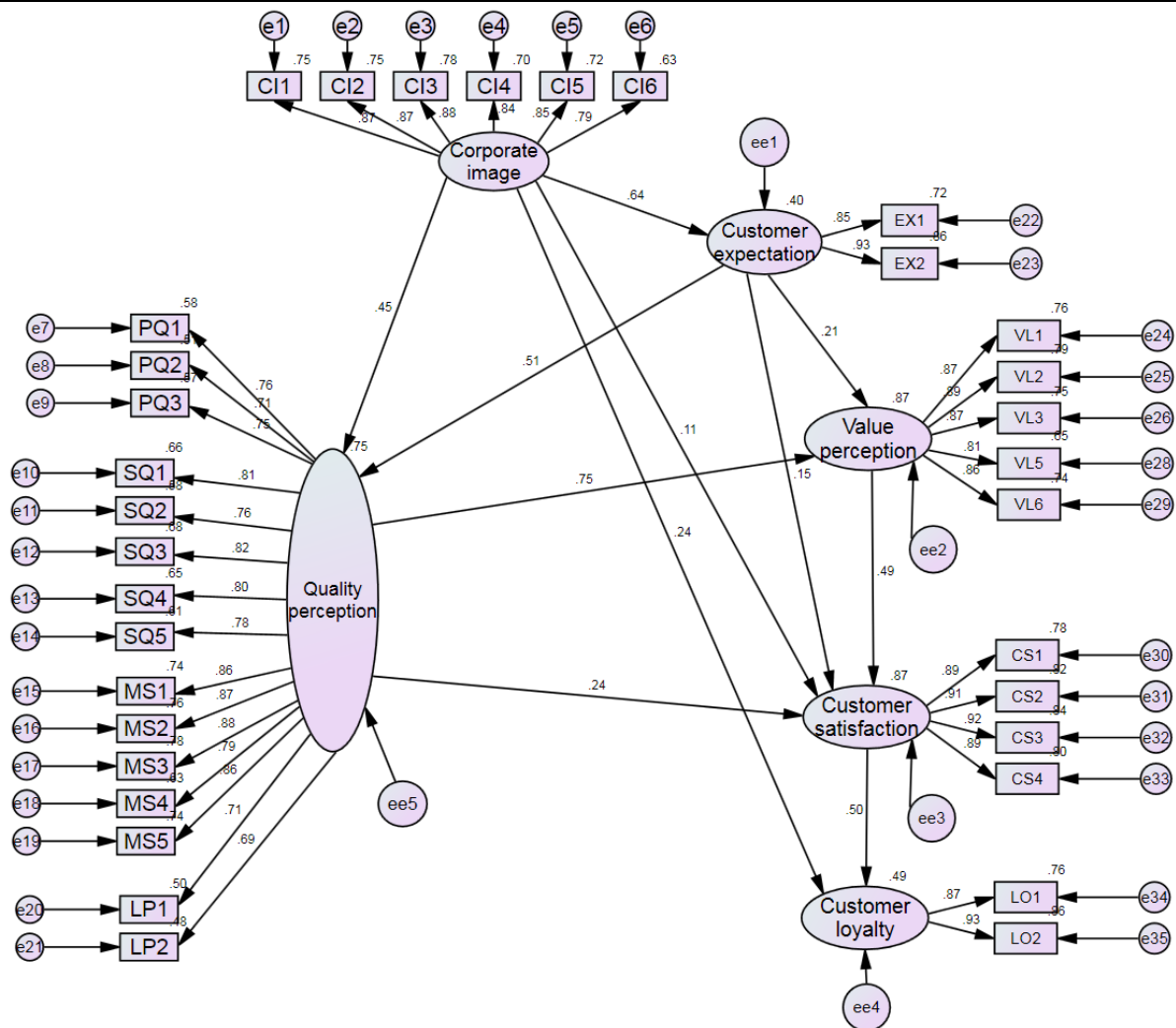


Figure 4.2 Standardized path relationship results diagram for the revised model

Table 4.10 Revised model fit indices values

Fit Indices	Criteria	Evaluation	Model Fit Test Results
Chi-square	-	P>0.05	4824.280(P<0.01)
GFI	≥0.90	Closer to 1 is better	0.847
AGFI	≥0.80	Closer to 1 is better	0.824

SRMR	≤0.10	Smaller is better	0.038
RMSEA	<0.08	Smaller is better, acceptable in the 0.05-0.08 range	0.068
NFI	≥0.90	Closer to 1 is better	0.923
NNFI	≥0.90	Closer to 1 is better	0.924
CFI	≥0.90	Closer to 1 is better	0.930
IFI	≥0.90	Closer to 1 is better	0.930

Table 4.11 Standardized regression coefficients between latent variables in the revised model

Path	Estimate	S.E.	C.R.	P
H1a: Quality perception<---Corporate image	0.45	0.021	20.354	<0.001
H1b: Customer expectation<---Corporate image	0.635	0.025	26.052	<0.001
H1d: Customer satisfaction<---Corporate image	0.11	0.019	5.97	<0.001
H1e: Customer loyalty<---Corporate image	0.236	0.039	7.504	<0.001
H2a: Quality perception<---Customer expectation	0.507	0.021	21.904	<0.001
H2b: Value perception<---Customer expectation	0.213	0.023	9.711	<0.001
H2c: Customer satisfaction<---Customer expectation	0.15	0.023	6.667	<0.001
H3a: Value perception<---Quality perception	0.754	0.032	27.575	<0.001
H3b: Customer satisfaction<---Quality perception	0.241	0.045	6.055	<0.001
H4: Customer satisfaction<---Value perception	0.493	0.038	12.276	<0.001
H5: Customer loyalty<---Customer satisfaction	0.504	0.038	15.588	<0.001

From Table 4.10, it can be seen that after removing the non-significant paths, the fit of the revised model to the data has improved and is acceptable. Furthermore, from Table 4.11, all the standardized path coefficients among the retained latent variables are significant and reasonable.

4.6 Hypotheses testing

Hypotheses testing was conducted using Amos 20 statistical analysis software. The parameters of the hypothesis model were standardized estimated using the maximum likelihood method, resulting in the standardized path relationships in the model (as shown in Figure 4.2) and the corresponding Amos results report.

The standardized path relationships in the results graph include two types of standardized path coefficients: those between latent variables and observed variables and those between exogenous latent variables and endogenous latent variables.

The standardized path coefficients between latent variables and observed variables represent factor loading coefficients. Generally, a loading coefficient greater than 0.5 indicates good individual reliability of the corresponding observed variable, while a coefficient below this threshold suggests poor individual reliability. The factor loading coefficients for the SEM in this study are presented in Table 4.12.

Table 4.12 Factor loading coefficients

Latent Variable	Observed Variable	Standardized coefficient	S.E.	C.R.	P
Corporate image	CI1	0.866			
	CI2	0.866	0.02	49.756	<0.001
	CI3	0.884	0.02	51.756	<0.001
	CI4	0.84	0.021	46.894	<0.001
	CI5	0.846	0.018	47.584	<0.001
Customer expectation	CI6	0.794	0.021	42.554	<0.001
	EX1	0.85			
	EX2	0.928	0.023	47.014	<0.001
Value perception	VL1	0.874			
	VL2	0.888	0.019	53.875	<0.001
	VL3	0.867	0.02	51.176	<0.001
	VL5	0.806	0.022	44.558	<0.001
Customer satisfaction	VL6	0.859	0.021	50.245	<0.001
	CS1	0.886			
	CS2	0.905	0.018	58.226	<0.001
	CS3	0.918	0.018	60.225	<0.001
Customer loyalty	CS4	0.893	0.019	56.362	<0.001
	LO1	0.874			
	LO2	0.926	0.027	42.249	<0.001
Quality perception	PQ1	0.763			
	PQ2	0.713	0.036	32.112	<0.001
	PQ3	0.754	0.032	34.262	<0.001
	SQ1	0.813	0.029	37.526	<0.001
	SQ2	0.759	0.025	34.535	<0.001
	SQ3	0.823	0.03	38.126	<0.001
	SQ4	0.803	0.029	36.997	<0.001
	SQ5	0.784	0.034	35.904	<0.001
	MS1	0.858	0.027	40.114	<0.001
	MS2	0.872	0.028	40.951	<0.001
	MS3	0.88	0.029	41.473	<0.001
	MS4	0.795	0.032	36.525	<0.001
	MS5	0.861	0.029	40.305	<0.001
	LP1	0.708	0.028	31.85	<0.001
	LP2	0.692	0.032	31.006	<0.001

From Table 4.12, it can be observed that the factor loading coefficients for each measurement item in the model are all greater than 0.7, and they are significant at the $p < 0.001$ level. Therefore, this study can proceed with further data analysis.

Based on Table 4.9, Table 4.11, and Figure 4.2, this study has constructed a path diagram depicting the relationships between latent variables (as shown in Figure 4.3) and conducted hypothesis testing.

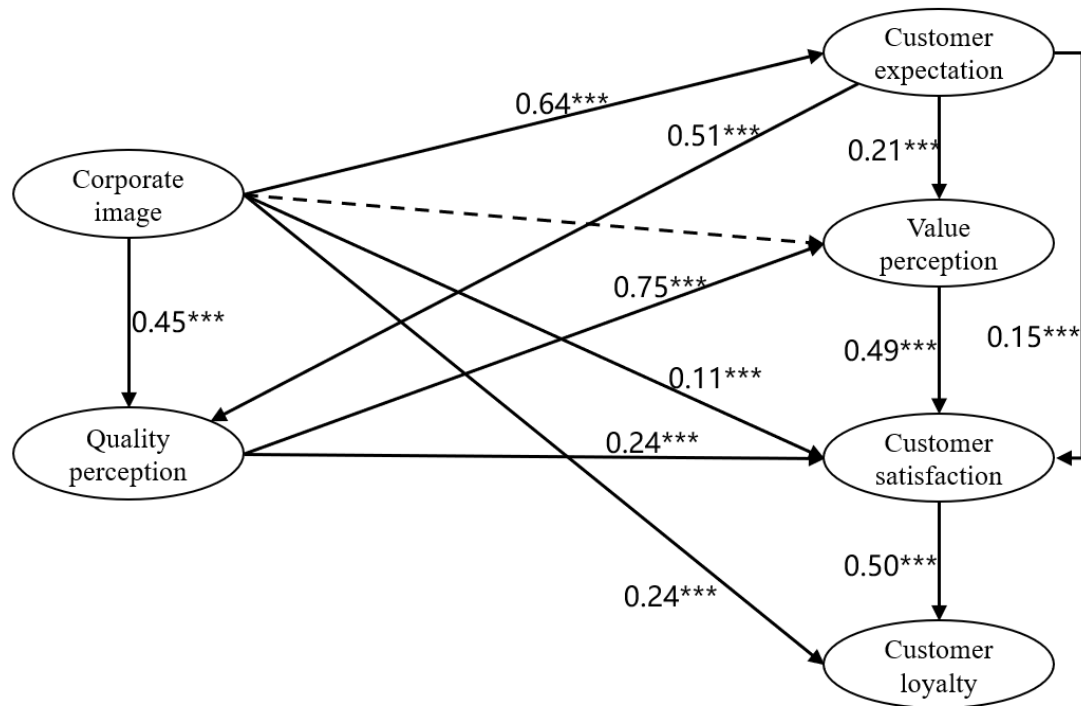


Figure 4.3 The conceptual model and path of this study

From Figure 4.3, it can be observed that the standardized path coefficient of corporate image on quality perception is 0.45 ($p < 0.001$), indicating that corporate image significantly positively influences quality perception. Therefore, hypothesis H1a (Corporate image positively affects quality perception) is supported. The standardized path coefficient of corporate image on customer expectations is 0.64 ($p < 0.001$), indicating that corporate image significantly positively influences customer expectations. Therefore, hypothesis H1b (Corporate image positively affects customer expectations) is supported. The standardized path coefficient of corporate image on customer satisfaction is 0.11 ($p < 0.001$), indicating that corporate image significantly positively influences customer satisfaction. Therefore, hypothesis H1d (Corporate image positively affects customer satisfaction) is supported. The standardized path coefficient of corporate image on customer loyalty is 0.24 ($p < 0.001$), indicating that corporate image significantly positively influences customer loyalty. Therefore, hypothesis H1e (Corporate image positively affects customer loyalty) is supported. From Table 4.9, it can be seen that the standardized path coefficient of corporate image on Value perception is 0.011 ($p > 0.05$). Therefore, hypothesis H1c (Corporate image positively affects Value perception) is not supported.

Customer expectations have a standardized path coefficient of 0.51 ($p < 0.001$) on quality perception, indicating that customer expectations significantly positively influence quality perception. Therefore, hypothesis H2a (Customer expectations positively affect quality

perception) is supported. The standardized path coefficient of customer expectations on Value perception is 0.21 ($p < 0.001$), indicating that customer expectations significantly positively influence Value perception. Therefore, hypothesis H2b (Customer expectations positively affect Value perception) is supported. The standardized path coefficient of customer expectations on customer satisfaction is 0.15 ($p < 0.001$), indicating that customer expectations significantly positively influence customer satisfaction. Therefore, hypothesis H2c (Customer expectations positively affect customer satisfaction) is supported.

Quality perception has a standardized path coefficient of 0.75 ($p < 0.001$) on Value perception, indicating that quality perception significantly positively influences Value perception. Therefore, hypothesis H3a (Quality perception positively affects Value perception) is supported. The standardized path coefficient of quality perception on customer satisfaction is 0.24 ($p < 0.001$). Therefore, hypothesis H3b (Quality perception positively affects customer satisfaction) is supported.

Value perception has a standardized path coefficient of 0.49 ($p < 0.001$) on customer satisfaction, indicating that Value perception significantly positively influences customer satisfaction. Therefore, hypothesis H4 (Value perception positively affects customer satisfaction) is supported.

Customer satisfaction has a standardized path coefficient of 0.5 ($p < 0.001$) on customer loyalty, indicating that customer satisfaction significantly positively influences customer loyalty. Therefore, hypothesis H5 (Customer satisfaction positively affects customer loyalty) is supported.

Based on the theoretical analysis and empirical research results presented above, this study has summarized the hypothesis testing results for this study, as shown in Table 4.13.

Table 4.13 Hypotheses test results summary

Hypotheses	Test Result
H1a: Quality perception<---Corporate image	Not Rejected
H1b: Customer expectation<---Corporate image	Not Rejected
H1c: Value perception<---Corporate image	Rejected
H1d: Customer satisfaction<---Corporate image	Not Rejected
H1e: Customer loyalty<---Corporate image	Not Rejected
H2a: Quality perception<---Customer expectation	Not Rejected
H2b: Value perception<---Customer expectation	Not Rejected
H2c: Customer satisfaction<---Customer expectation	Not Rejected
H3a: Value perception<---Quality perception	Not Rejected
H3b: Customer satisfaction<---Quality perception	Not Rejected
H4: Customer satisfaction<---Value perception	Not Rejected
H5: Customer loyalty<---Customer satisfaction	Not Rejected

Based on Figure 4.3, this study can further analyze and calculate the direct effects, indirect effects, and total effects of the influencing variables (corporate image, customer

expectations, quality perception, and Value perception) on customer satisfaction and customer loyalty. The summary of these effects is presented in Table 4.14.

Table 4.14 The impact of various variables on customer satisfaction and customer loyalty

Variable	Effect impact	Corporate image	Customer expectation	Quality perception	Value perception	Customer satisfaction
Customer satisfaction	Direct Effect	0.11	0.15	0.24	0.49	-
	Indirect Effect	0.64	0.42	0.37	-	-
	Total Effect	0.75	0.57	0.61	0.49	-
Customer loyalty	Direct Effect	0.24	-	-	-	0.50
	Indirect Effect	0.38	0.29	0.31	0.25	-
	Total Effect	0.62	0.29	0.31	0.25	0.50

Chapter 5: Discussion

Internet pharmacies represent a novel form of vertical e-commerce. Due to strict government regulations governing the sale and distribution of pharmaceuticals, the development of Internet pharmacies lagged behind traditional e-commerce for general merchandise. However, with increased attention from the government and policy easing in recent years, Internet pharmacies have experienced rapid growth.

This study primarily focuses on the factors influencing customer satisfaction on internet pharmaceutical sales platforms targeting retail consumers. Previous scholars have typically analyzed satisfaction using models like ACSI or ECSI. In this research, this study opted for the CCSI model, which is better suited to the Chinese context. Drawing from existing literature and considering the specific ecosystem and demands of Internet pharmacies, this study elaborated a customer satisfaction model with six primary indicators and 36 secondary indicators. This study empirically validated relevant hypotheses and optimized the model through surveys and data analysis.

5.1 Analysis of factors affecting customer satisfaction

Based on the preceding research, it is evident that factors such as corporate image, quality perception, customer expectations, and value perception significantly influence customer satisfaction on internet pharmacies, ranking in descending order of influence: corporate image, quality perception, customer expectations, value perception.

5.1.1 The impact of corporate image on customer satisfaction

The results of this study demonstrate that corporate image is the most crucial factor influencing customer satisfaction, aligning with the conclusions of previous research. For instance, J. Zhang's (2013) study on B2C e-commerce shopping environments found that corporate image significantly affects customer satisfaction. Furthermore, the study reveals that corporate image also has a substantial impact on customer loyalty. This underscores the importance of corporate image in influencing consumers throughout the development and growth of internet-based companies. Given the industry expertise and prior experience that

informed this research, this study recognized the critical role of corporate image in internet pharmaceutical e-commerce. As a result, this study placed significant emphasis on including the corporate image variable in the CCSI model. The results of the study confirm the hypothesis.

5.1.2 The impact of quality perception on customer satisfaction

Regarding quality perception, this study observed product quality perception, service quality perception, pharmaceutical expertise perception, and logistics experience. In the conceptual model, this study conducted a comprehensive assessment of these aspects. The results of this model directly emphasize the importance of quality perception on customer satisfaction in internet pharmacies, which is consistent with many prior studies on e-commerce (J. Zhang, 2013; Y. Zhou, 2019). In a customer satisfaction survey of online platform shopping, H. Y. Li (2011) also found that customer service is a crucial factor.

In the unique context of the pharmaceutical e-commerce industry, timely and comprehensive pre-sales and after-sales services help customers use medications more accurately and promptly, addressing their health needs. Due to the critical nature of pharmaceuticals and the heightened attention customers pay to them, the service requirements for pharmaceutical platforms are more prominent than for general e-commerce platforms. This result suggests that pharmaceutical platform companies need to ensure both the compliance and quality of the products they sell to instill trust in customers. Simultaneously, they should invest more in improving their service levels to retain more customers.

Pharmaceutical expertise is a distinctive factor for internet pharmacies. The reason for including it in the study of quality perception is twofold. Firstly, in practical research and experience, customers are particularly concerned about the pharmaceutical expertise of pharmaceutical e-commerce platforms, which is one of the essential foundations for gaining customer trust. Secondly, there has been no previous literature on this factor in historical research. It is believed that strengthening pharmaceutical expertise is beneficial for the long-term development of internet pharmacies. However, because building pharmaceutical expertise is relatively complex, resource-intensive, and has a slower impact, it may not need to be the primary focus for early-stage business development.

In the early days of e-commerce, logistics bottlenecks were a significant pain point. However, with the rapid development of the logistics industry in China over the past decade, logistics efficiency and convenience have become less of a concern. Historical data from the

Jianke.com Online Pharmacy indicated that logistics issues consistently ranked as the second most common customer complaint. The conceptual model offers a holistic view of related factors and does not specifically address the logistics experience of a small minority of customers. Future research could delve further into studying complaint issues related to logistics.

5.1.3 The impact of customer expectations on customer satisfaction

This study found that customer expectations are also a crucial factor influencing customer satisfaction in this study. This indicates that, compared to other e-commerce platforms, customers of internet pharmacies have relatively high expectations. When various aspects of the platform do not meet these high expectations, it can directly or indirectly affect customer satisfaction. This may be related to the uniqueness of pharmaceutical products. Comparatively, people's expectations and requirements for general goods may not be as high. For example, in a study of customer satisfaction in the fresh produce e-commerce sector, it was found that customer expectations had a less significant impact. Some study attributes this to the uncertainties associated with seasonal and perishable fresh produce (W. Q. Wu, 2017).

However, for pharmaceuticals, due to their direct impact on health and well-being, people's expectations are generally much higher than for regular products. In the practical work, this study has even encountered cases where customers believed that the medicines provided by the platform were fake because their condition did not improve after taking them. The increased expectations of customers also directly and indirectly intensify the influence of customer expectations on customer satisfaction. This highlights the suitability of using the expectation-disconfirmation model theory as the core framework for customer satisfaction research (Y. Feng, 2016).

5.1.4 The impact of value perception on customer satisfaction

Value perception is a psychological result where customers compare the quality and value of a product or service to the cost they have incurred. It represents the subjective comparison of the overall benefits and costs of the shopping process (Lian & Zhang, 2016).

From the results of the final conceptual model, it is evident that in the context of internet pharmacies, value perception has a significant impact on customer satisfaction, which is consistent with previous research on e-commerce platforms (L. J. He, 2017).

Additionally, the impact of value perception could be related to the characteristics of

pharmaceutical e-commerce platforms. Customers who turn to online platforms for medication often prefer the convenience and affordability offered by internet pharmacies, as they may wish to avoid visiting physical pharmacies or hospitals. Therefore, customers of internet pharmacies tend to place a strong emphasis on the overall value they receive from their transactions. This aligns with the finding that price is one of the most critical factors for customers in e-commerce platforms based on previous surveys.

It is important to note in this study that, based on the results of statistical analysis, H1c that corporate image has a direct positive effect on value perception is rejected. The rejection of this hypothesis indicates that in the context of online pharmaceutical platforms, the variable of corporate image does not significantly influence customers' perception of value.

In this study, corporate image primarily represents consumers' attitudes and views towards e-commerce enterprises in the pharmaceutical sector before purchasing medications through internet pharmacies. Essentially, it represents the trust customers place in a given company. Value perception refers to the customers' assessment of the trade-off between expenditure and actual benefit received during the purchase of products or services.

The findings suggest that recognition of a corporate image, or the trust customers have in a company, does not significantly affect their perceived value when purchasing its products or services. In other words, customers shopping on platforms with a good corporate image do not necessarily feel a better cost-benefit ratio for specific products or services due to their trust in the company. This highlights that for pharmaceutical e-commerce platforms, real efforts in product and service improvement are more critical in slowly building customer satisfaction and loyalty than mere image promotion. In the early stages of development for pharmaceutical e-commerce businesses, allocating limited funds to enhance products and services might be a more efficient way to gain customer approval. This could be one of the reasons why, in their initial stages, Chinese online pharmaceutical companies spend less on widespread brand promotion (such as advertising to directly enhance corporate image).

However, it should also be recognized that while corporate image does not have a significant direct positive impact on value perception, it plays the most significant role in influencing customer satisfaction and loyalty overall. Therefore, it is acknowledged that enhancing the overall corporate image should be a strategic priority in the middle and later stages of business development.

5.1.5 The impact of various factors on customer loyalty

The factors influencing customer loyalty are ranked in descending order of significance as follows: corporate image, customer satisfaction, quality perception, customer expectations, value perception.

The direct impact of customer satisfaction on customer loyalty has been validated by numerous studies, reaffirmed by this research (Qiu, 2017a).

Notably, in the conceptual model of this study, corporate image is the most influential factor on customer loyalty. This suggests an important phenomenon: although customers may not consciously focus on corporate image during their shopping process on the platform, it might significantly influence their subsequent choices when it comes to repurchasing. In the case of internet pharmacies, this phenomenon may be linked to the higher level of trust required by customers in pharmaceutical transactions compared to typical merchandise transactions. This perspective aligns with studies that have explored the relationship between satisfaction and trust in affecting customer loyalty (Qiu, 2017b).

Furthermore, the dual drive theory of satisfaction and value suggests that customer satisfaction and customer value jointly contribute to customer loyalty (Shen, 2005). This suggests that, for the findings, this study could also consider them from the perspective of customer value satisfaction: even if customers do not achieve high levels of satisfaction (which is influenced by various factors), they may still exhibit higher loyalty if they perceive value during their shopping experience. Therefore, this thesis argues that establishing a strong corporate image is essential for the long-term success of internet pharmacies. However, the impact of this factor on customer satisfaction and loyalty may not be uniform, and we look forward to more data confirmation in future research.

Moreover, the impacts of other factors on customer loyalty are generally consistent with their impact on customer satisfaction.

5.2 Satisfaction models

There are several commonly used customer satisfaction index models worldwide, including the SCSII model, the ACSI model, the ECSII model, and the CCSII model. In this study, the Japanese Customer Satisfaction Index model was not included as it was not considered suitable for empirical operation.

The choice of the CCSII model as the fundamental model for designing the customer

satisfaction model for internet pharmacies was based on two main considerations. Firstly, compared to the ACSI model, the significant feature of the CCSI model is the inclusion of corporate image as a latent variable. This reflects the emphasis in China on studying customer satisfaction, with a focus on the role of an organization's overall image in the minds of consumers. This is also related to the Chinese context. In recent decades, China has seen rapid economic development, with a significant increase in economic power. However, the corresponding legal regulations and enforcement in the market economy are not yet fully developed. The channels for consumer complaints and protection are not as smooth as in developed Western countries.

Consequently, a brand's image becomes a critical cornerstone of trust. In the case of e-commerce platforms, interactions between consumers and the platform take place online, making trust even more crucial. Building trust begins with the corporate image. Therefore, this study combined the above analysis and adopted the corporate image as a latent variable in the conceptual model. Empirical results further confirmed the previous analysis and hypotheses. The results indicate that corporate image is the most crucial factor among various influencing factors, having the most significant impact on customer satisfaction.

Secondly, the CCSI model differs from the other models in that it excludes customer complaints as a research variable. The primary focus of this study is customer satisfaction, and further research on customer complaints will be conducted in the future. The CCSI model downplays the content of customer complaints, which aligns with the research objectives of this study.

The conceptual model in this thesis was initially designed through theoretical analysis, and then, a small-sample survey and analysis were conducted to optimize some items that did not meet standards. Subsequently, a large-sample empirical study was conducted. Using statistical methods and goodness-of-fit tests, the theoretical model was further optimized to obtain the best-fitting final customer satisfaction model. It can be seen that through the step-by-step refinement of the model at three levels, the final model obtained in this study can be applied to a wider range of peer companies. However, due to the confidentiality of customer information in China's pharmaceutical e-commerce companies, the research cannot currently obtain more data for further validation. We look forward to collaborating with various companies in the industry to conduct further verification and practical applications.

The exploratory model, through statistical tests, removed two observed variables that did not meet requirements: "Corporate Brand Honor (CI7)" and "Comparison with Physical Pharmacies (VL4)." We speculate that "Corporate Brand Honor (CI7)" may not be suitable as

an observed variable for corporate image in this context because pharmaceutical e-commerce products are standardized medicines, and the inherent glamour and brand value of medicines are often not prominent. Therefore, this observed variable may not have a significant impact in this study. “Comparison with Physical Pharmacies (VL4)” may not be suitable as an observed variable for value perception, possibly due to differences in customer experiences and expectations between physical pharmacies and internet pharmacies.

Additionally, our study's selected subject, Jianke.com, is Guangdong's first legally-operating internet pharmaceutical enterprise, and it also offers the largest-scale professional online pharmacy services nationwide. With a comprehensive range of medicines and service coverage across all provinces and cities, it aptly represents the e-commerce business model in China's pharmaceutical industry. Therefore, conducting a customer satisfaction model study with Jianke.com as the subject is considered representative.

5.3 Recommendations for the development of internet pharmaceutical e-commerce companies

Customer satisfaction directly impacts customer loyalty, which in turn has a significant influence on a company's business performance. Based on the findings of this research, the following recommendations are provided for platform companies in the internet pharmacy industry:

5.3.1 Strengthen corporate image building

The corporate image represents the trustworthiness and approval of a company or organization in the public eye. In this study, it was found that corporate image has the most significant impact on customer satisfaction, making it a crucial variable. This indicates that online pharmaceutical companies should prioritize this element.

Corporate image for customers encompasses brand building. Branding is one of the key strategies for online pharmacies, covering various aspects through which the company establishes a unique identity and recognition in the market. In the context of online pharmacies, branding includes elements such as visual identification systems (logos, symbols, visual design), auditory identification systems (corporate music, tone), and emotional identification systems (emotions and values conveyed by the brand). Corporate image, observed from the perspective of external observers, includes the company's reputation,

credibility, and corporate culture. In the field of online pharmacies, corporate image is also influenced by factors such as industry expertise and service quality.

To a large extent, corporate image determines customers' perception and trust in online pharmacies. When customers have a positive perception of an online pharmacy's brand and image, they are more likely to trust and favor the company. This trust and favorability directly affect customer satisfaction and loyalty.

This is primarily evident in the following aspects:

a. Trust and Loyalty: A well-established brand and corporate image can help online pharmacies build trust. Customers are more willing to purchase medications from trustworthy brands, thus enhancing loyalty and repeat purchases.

b. Consistent Experience: Branding ensures a consistent customer experience across various channels and touchpoints. Whether it's online shopping, customer service consultations, or drug delivery, consistent experiences help meet customer expectations.

c. Values and Emotions: Through branding and corporate image, online pharmacies can associate themselves with specific values and emotions. Customers are more likely to connect with brands that share similar values, enhancing customer satisfaction.

d. Reducing Purchase Decision Uncertainty: An online pharmacy with a good reputation and corporate image can reduce customer uncertainty during purchases. Customers are more confident buying products from reputable companies, thereby increasing their satisfaction.

Therefore, we suggest that online pharmaceutical companies can undertake the following strategies to enhance their corporate image:

a. Clear Positioning and Value Proposition: Online pharmacies should clearly position themselves and explicitly communicate their core values, which include the company's mission, vision, and service philosophy. Through clear positioning and communication, the company can establish a unique market position and attract a compatible customer base.

b. High-Quality Products and Services: Branding and corporate image should be rooted in high-quality medications and excellent customer service. Online pharmacies should ensure the quality and safety of their products while providing a satisfying shopping experience, covering the entire process from supply chain management to logistics.

c. Active Social Responsibility: Online pharmacies can enhance their corporate image by actively participating in social responsibility projects. This includes donating medications to those in need, supporting health education, and promoting wellness.

d. Building Positive Customer Relationships: Online pharmacies should actively interact with customers and establish positive relationships. This includes responding to customer

feedback, solving problems, and providing personalized services.

e. **Maintain Transparency and Integrity:** Companies should be transparent and share information regarding product quality, pricing, and marketing. Transparency helps establish long-term trust, making customers more willing to choose companies that share authentic information.

Furthermore, the business models and strategies of internet companies differ from those of traditional businesses. Internet companies often prioritize rapid scale expansion and quick market capture. Consequently, many internet companies, especially in their initial and medium stages, tend to overlook or lack the resources to focus on brand and corporate image building.

However, in reality, the first point of trust for customers when engaging with e-commerce companies, particularly in highly specialized fields like online pharmaceuticals, is often the corporate image. This is especially significant as there is a much larger expertise asymmetry between customers and platforms in specialized sectors like pharmaceuticals compared to general e-commerce. Although this study shows that corporate image does not have a significant direct impact on customers' value perception, overall indicates that corporate image is the most significant factor affecting customer satisfaction. Therefore, this study advises operators of online pharmaceutical companies to prioritize building a corporate image.

Although many advertising platforms offer increasingly sophisticated targeting techniques that can boost platform traffic and operational performance in the short term, this is not a sustainable strategy. Therefore, managers should start focusing on brand and corporate image once the company has resolved its immediate survival concerns. Allocating a portion of limited resources to long-term brand building will provide a sustained and solid impetus for the company's long-term growth.

5.3.2 Increase investment in service quality.

Among the various factors influencing customer satisfaction, perceived quality stands at the forefront. For online pharmaceutical retailers, their product—medicine—has standardized and uniform quality, subject to stringent national regulation. However, service quality represents a significant area where companies can innovate and improve. Service is crucial for an e-commerce business, especially one dealing with pharmaceuticals. Compared to general retail businesses, the products (medicines) of online pharmaceutical retailers are highly consistent in variety and quality. Furthermore, with developments in China like uniform assessments,

centralized purchasing, and the widespread adoption of health insurance, price differences are also regulated by the government. Given the limited product differentiation, service becomes an increasingly significant factor. Online pharmaceutical retailers have ample scope to distinguish themselves through enhanced service offerings. Elevating the level of service not only aids in increasing customer satisfaction but also provides a competitive edge in the overall market.

In the online pharmaceutical industry, enhancing service quality is of paramount importance. Compared to general retail businesses, the products sold by online pharmaceutical retailers—medicines—are highly consistent in terms of variety and quality, making price differentiation relatively limited. Consequently, in the operational landscape, the quality of service emerges as a pronounced competitive advantage.

a. Importance of Service

The specific nature of products in the pharmaceutical e-commerce space underscores customers' heightened focus on quality. Customers, when purchasing medicines, often seek professional, timely, and attentive service, which is critical for their health. Providing high-quality service is not just a competitive advantage but also a responsibility and commitment.

b. Competitive Advantage through Service

In the internet pharmacy industry, the homogeneity of products and regulatory oversight make service quality a key differentiator. By offering more efficient, convenient, and user-friendly services, companies can stand out in the competition. For instance, establishing a fast and efficient logistics system or providing professional online consultation services are effective ways to enhance service levels.

c. Investment and Returns

Increasing investments in service quality is a long-term strategic decision. While it may incur initial costs, elevating customer satisfaction brings in greater returns. Satisfied customers are more likely to repurchase and can become loyal brand advocates. Moreover, they may generate more business through positive word-of-mouth.

d. Continuous Optimization of Service Levels

Companies should consistently monitor and improve service quality. By collecting customer feedback and understanding their needs and expectations, targeted improvements can be made. Additionally, firms can adopt best practices from the industry, introduce new technologies and tools, to improve both service efficiency and quality.

e. Strong Link between Service and Customer Satisfaction

Improvements in service quality directly impact customer satisfaction. When customers

perceive that a company offers excellent service, their trust and approval for the brand increase, thereby elevating their satisfaction levels. An improvement in customer satisfaction, in turn, promotes the company's reputation and brand image, resulting in a virtuous cycle.

In summary, making substantial investments related to service quality is one of the key strategic imperatives for online pharmaceutical retailers striving for competitive advantages in a fiercely competitive market. By providing high-quality, efficient services, companies can attract more customers, improve customer satisfaction, and thereby gain a competitive edge. This also reflects a responsible approach to customer health and rights, contributing to the establishment of a robust brand reputation and image.

5.3.3 Concerning the development of pharmaceutical expertise

The pharmaceutical expertise is a prominent feature of online pharmacies, directly affecting customer trust and satisfaction and consequently exerting a far-reaching impact on corporate competitiveness. We argue that it is crucial for e-pharmacy businesses to gain an edge in expertise development, yet they must also strive for balance at different stages of growth.

Online pharmacies must adhere to stringent quality and safety standards for the medications they sell. Given that customers often lack medical expertise, they place extremely high demands on the credibility and professional nature of these products. In this context, the professional image and service processes of e-pharmacy businesses become the foundational elements in securing customer trust.

Pharmaceutical expertise must be demonstrated at every customer touchpoint by e-pharmacy companies, including:

- a. Website Information Display: Detailed information and instructions for medicines must be accurate and easily understandable to meet customers' reasonable expectations.
- b. During the Online Purchase Process: A guided medication purchasing process and shopping experience should be provided, reassuring customers that they are dealing with a professional pharmaceutical enterprise.
- c. Post-sale Consultations: Customers may have questions or need expert advice about the medications; thus, the company's customer support team needs to offer high-quality responses and suggestions.
- d. Adverse Reaction Management: Should a customer experience adverse effects, the company must offer prompt and professional countermeasures to safeguard customer health and rights.

While pharmaceutical expertise is crucial for building customer trust, companies must balance various factors throughout their growth. The demands for expertise differ at distinct stages, and companies are often constrained by their own resources and talent. Therefore, pinpointing the focus at different stages and achieving a balanced growth strategy becomes increasingly critical. Here are some suggestions:

a. **Emphasize Service Quality and Corporate Image Early On:** When the company is newly established or in its infancy, focus should be placed on creating high-quality service processes and a positive corporate image to garner initial customer trust and retention.

b. **Rational Allocation of Limited Resources:** Emerging e-pharmacy businesses often operate with limited resources. Therefore, resources must be allocated wisely based on the current stage of development. Initially, more investment can be put into service quality and brand building, and later on, one can focus on enhancing pharmaceutical expertise.

c. **Phase-wise Development of Pharmaceutical Expertise:** Once the company has reached a certain stage, it could consider incrementally intensifying the build-up of pharmaceutical expertise. This may include staff training to improve pharmaceutical knowledge, establishing partnerships for greater professional support, or recruiting more specialized talent. Doing so will assist the company in establishing a professional image and a competitive advantage in the marketplace.

Pharmaceutical e-commerce enterprises must maintain sensitivity in the construction of their professional expertise, allocating resources and strategies judiciously according to the needs of different developmental stages, with the aim of enhancing service quality and professionalism. Professionalism is a critical element in establishing customer trust and satisfaction. Concurrently, equal emphasis should be placed on corporate image and service quality to achieve sustained development and success.

Pharmaceutical expertise is not only a distinctive feature of online pharmacies but also a significant component in the perception of quality. It serves as a leading indicator for the public to gauge the quality of the platform, given the asymmetric information between service providers and service recipients in the medical field. Therefore, e-pharmacy companies should highlight their pharmaceutical expertise as a crucial strategic direction to attract and effectively serve customers.

However, it is observed that the perception of quality is highly influential in customer satisfaction, and this study includes the perception of pharmaceutical expertise within this domain. While corporate image and other factors are also critical in affecting customer satisfaction, a company's growth is a gradual process.

Therefore, how should a company balance these varying elements for sustained growth? From a strategic standpoint, we recommend that online pharmacies, in their early stages, should not overly focus on building pharmaceutical expertise. Instead, they should allocate limited resources primarily towards service quality and corporate image for maximum business impact and customer retention. As the company matures, it can consider placing a greater emphasis on building pharmaceutical expertise, distinguishing it from competitors and solidifying its unique selling proposition.

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Chapter 6: Conclusions

6.1 Research conclusions

This study focused on internet pharmacies and based on literature research, expert interviews, and practical experience, initially constructed a theoretical model of customer satisfaction for internet pharmacies. Through preliminary surveys, large-scale empirical research, and model optimization, this study developed the final customer satisfaction model for internet pharmacies. This study analyzed and discussed the factors influencing customer satisfaction and provided recommendations for improving customer satisfaction and enhancing business operations. The main conclusions can be summarized in three aspects:

6.1.1 Construction of the internet pharmacy customer satisfaction model

Although some articles have conducted investigative studies on customer satisfaction in the context of internet pharmacies, there is currently a lack of systematic analysis and industry-specific evaluation models and data. This study adopted a customer satisfaction perspective, based on research into the theory, history, and development of customer satisfaction, as well as a review of relevant literature on e-commerce platforms, and a study and analysis of factors influencing customer satisfaction in e-commerce platforms. Starting with six variables, including corporate image, quality perception, customer expectations, and value perception, this study formulated hypotheses and constructed a theoretical model of customer satisfaction for internet pharmacies.

This study conducted a preliminary survey, optimized questionnaire items, and performed large-scale empirical research. Through statistical corrections, this study obtained and verified the final customer satisfaction model for internet pharmacies, based on the CCSI model as a prototype. This provides new research data for the study of customer satisfaction in internet pharmacies and offers empirical evidence for businesses to enhance customer satisfaction and improve business performance.

6.1.2 Identification of the main factors affecting internet pharmacy customer satisfaction

Internet pharmacies have emerged in China for over a decade, with rapid growth in recent

years due to policy changes. However, there is still limited systematic research on customer satisfaction in internet pharmacies. This study, based on analysis of relevant theoretical literature and empirical research focused on the Jianke.com Online Pharmacy, established a customer satisfaction model for internet pharmacies and analyzed the main factors affecting customer satisfaction. The results indicate:

1) The factors affecting customer satisfaction in internet pharmacies, ranked from most to least significant, are as follows: corporate image, quality perception, customer expectations, and value perception.

2) The factors influencing customer loyalty in internet pharmacies, ranked from most to least significant, are as follows: corporate image, customer satisfaction, quality perception, customer expectations, and value perception.

6.1.3 Recommendations for improving customer satisfaction in pharmaceutical e-commerce platform businesses.

Customer satisfaction directly impacts customer loyalty and, consequently, the business performance of companies. Based on the results of this study, this study recommends that pharmaceutical e-commerce platform businesses focus on two main areas: strengthening corporate image and increasing investment related to service quality. This study also provides suggestions regarding the importance of pharmaceutical expertise in this context.

6.2 Research limitations

Due to the non-disclosure of corporate data and the commercial confidentiality of customer data, this research only conducted in-depth surveys and empirical research on customers of Jianke.com Online Pharmacy. While Jianke.com Online Pharmacy is one of the early and representative players in the field of internet pharmaceutical e-commerce platforms, it cannot represent the entire industry. Different peer companies, such as Alibaba Health, JD Health, Yiyao.com, Kangaiduo, have distinct business models and ecological environments. Therefore, the conclusions of this study may vary for other relevant companies in China. Further research and empirical studies are needed to enrich and develop the conceptual model.

6.3 Future research directions

Considering the significance of this study for the industry and its existing limitations, this

study suggests that future research can continue in the following areas:

6.3.1 Broad industry-wide validation of the internet pharmacy customer satisfaction model

Customer satisfaction directly influences a company's operations and development, especially in the e-commerce industry, where customer traffic is vital. Future research can apply the customer satisfaction model obtained in this study to a wider range of companies in the same industry to further validate the conclusions and practical applicability of this research.

6.3.2 Application research of the internet pharmacy customer satisfaction model

Both domestic and international business managers increasingly emphasize the importance of customer value. However, there is still a long way to go in terms of precisely studying and analyzing customer satisfaction to improve relevant products and services and ultimately enhance business performance. Good research theories need to be fully applied to fulfill their intended role. In the future, we should focus on and conduct research on how customer value can lead to improved business performance based on the existing conceptual model.

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Annex A: Other Tables

Table A.1 Latent variables and corresponding observed variables in the ACSI model

Latent Variable	Direct Effect
Customer expectation	Overall expectations
	Customized Expectations
	Reliability expectations
Quality perception	Overall assessment of product quality
	Evaluation of product customization quality
	Evaluation of product reliability
Value perception	Evaluation of the price of a product given the quality of the product
	Evaluation of product quality at a given product price
Customer satisfaction	Overall satisfaction
	Satisfaction with product quality compared to expectations
	Satisfaction with the quality of the product compared to the ideal product
Customer complaints	Number of complaints to dealers/vendors
Customer loyalty	Likelihood of repurchase
	Reserve price

Source: Zhou (2011)

Table A.2 Latent and corresponding observed variables in the ECSI model

Latent Variable	Direct Effect
Brand image	Overall image
	Business practice
	Enthusiastic service
	Social responsibility
Customer expectation	Overall expectations
	Customized Expectations
Sense the quality of the hardware	Overall assessment of the quality experience
	Satisfying Customer Needs
	Comparison with competitors
Perceived software quality	Overall assessment of the quality experience
	Satisfying Customer Needs
	Comparison with competitors
Value perception	Evaluation of the price of a product given the quality of the product
	Evaluation of product quality at a given product price
Customer satisfaction	Overall satisfaction
	Satisfaction compared to expectations
	Satisfaction compared to the ideal product
Customer complaints	Number of complaints to dealers/vendors
	Likelihood of repurchase
Customer loyalty	Possibility of purchasing other products/services
	Possibility of recommending to friends

Source: Zhou (2011)

Table A.3 Internal consistency analysis of customer expectations

Item	Mean	Standard deviation	CITC	Cronbach's coefficient after item deletion	Cronbach's alpha
EX1	4.11	0.76	0.776	-	0.874
EX2	4.18	0.75	0.776	-	

Table A.4 Internal consistency analysis of quality perception

Measurement item	Mean	Standard deviation	CITC	Cronbach's alpha coefficients for after item deletion	Cronbach's alpha coefficient
PQ1	4.36	0.68	0.767	0.959	0.963
PQ2	4.10	0.83	0.731	0.960	
PQ3	4.24	0.72	0.748	0.959	
SQ1	4.31	0.66	0.830	0.958	
SQ2	4.40	0.65	0.760	0.959	
SQ3	4.30	0.70	0.817	0.958	
SQ4	4.29	0.68	0.817	0.958	
SQ5	4.18	0.88	0.753	0.960	
MS1	4.33	0.65	0.829	0.958	
MS2	4.30	0.70	0.808	0.958	
MS3	4.27	0.71	0.863	0.957	
MS4	4.11	0.77	0.817	0.958	
MS5	4.24	0.75	0.823	0.958	
LP1	4.47	0.67	0.678	0.961	
LP2	4.37	0.79	0.647	0.962	

Table A.5 Internal consistency analysis of customer satisfaction

Measurement item	Mean	Standard deviation	CITC	Cronbach's alpha coefficient after item deletion	Cronbach's alpha coefficient
CS1	4.30	0.67	0.863	0.945	0.953
CS2	4.30	0.68	0.894	0.936	
CS3	4.30	0.67	0.892	0.937	
CS4	4.25	0.71	0.894	0.936	

Table A.6 Internal consistency analysis of customer loyalty

Measurement item	Mean	Standard deviation	CITC	Cronbach's alpha coefficient after item deletion	Cronbach's alpha coefficient
LO1	4.33	0.60	0.693	-	0.818
LO2	4.22	0.69	0.693	-	

Annex B: Questionnaire

Hello, our online pharmacy customer center is conducting a survey on customer satisfaction. Your answers will provide important data for our research and service improvement, thank you very much for your cooperation.

Please, in your busy schedule, follow your personal experience of purchasing medicines from online pharmacies and give your score to our questions based on real thoughts.

1, I think online pharmacies have a good level of integrity and focus on corporate reputation.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
2, I believe that the medicines sold by online pharmacies are genuine and have quality assurance.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
3. I believe that online pharmacies provide quality service and keep their promises to customers.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
4. I believe that online pharmacies will protect the privacy of customers' personal information.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
5, I believe that payment is safe during transactions in online pharmacies.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
6, the online pharmacy's "user first, professional and trustworthy" user values are consistent with its brand image.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
7. Shopping at an online pharmacy makes me look better in front of my friends	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
8. The packaging of drugs in online pharmacies is regular, and the efficacy and function of drugs are consistent with those bought from pharmacies/hospitals.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
9. Drugs from online pharmacies have regular delivery notes, instructions and complete packaging.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
10. Online pharmacies have a full range of medicines and I can usually find what I need.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
11, online pharmacies can provide personalized services that meet the needs of different customers.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
12. Online pharmacies can offer a variety of online payment options.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
13, The online pharmacy was quick to respond to the questions I asked.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
14. Online pharmacies can handle returns and exchanges in a timely manner.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
15. Online pharmacies will give more and more priority to their regular customers.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
16. Online pharmacies are very professional in their descriptions of basic information, scope of application, instructions for use, precautions, etc. of medicines.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
17. Online pharmacies are very professional in their pre-sale introduction of drugs and guidance on drug selection.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
18. Online pharmacies are very professional in providing after-sale medication guidance and answering questions about medicines.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
19. I can often buy new and uncommon drugs that have just come on the market from online pharmacies.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree

20, I am satisfied with the professional doctor services provided by the online pharmacy.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
21, logistics services - online pharmacy delivery of goods packaged complete, safe and undamaged.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
22. Online pharmacies deliver goods very quickly.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
23. I think I can get better quality medicines at the online pharmacy for the same price.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
24, I think that drugs from online pharmacies are cheaper for the same quality.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
25, I think the service exceeded my expectations for the same price.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
26, I think the service I received at the online pharmacy was good value for money.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
27, I think the shopping experience at online pharmacies is overall better than at brick and mortar pharmacies.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
28, I think the online pharmacy shopping experience is overall better than similar sites.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
29. I come to an online pharmacy expecting the medicine to be quality assured and reliable.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
30, I came to the online pharmacy to shop before expecting the service to be excellent.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
31, I think the quality of online pharmacy medicines is very good.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
32, I think the overall service of the online pharmacy is very good.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
33, I am very satisfied with the online pharmacy in general.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
34, The medicines and service from the online pharmacy were as good as I expected.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
35, I would shop on an online pharmacy again.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree
36, I would recommend a friend to shop on an online pharmacy.	1. strongly disagree 2. disagree 3. not sure 4. agree 5 strongly agree

Note: The actual questionnaires were distributed after the content was entered into a third-party website and differed in the format that respondents saw.

Lastly, ask for some personal information and we will be sure to keep it strictly confidential.

Your gender:	Men and women
Your age group:	Under 18, 18-25, 26-30, 31-40, 41-50, 51-60, 60 and over
Your marital status:	Unmarried, married, divorced, widowed
Your highest level of education:	Secondary and below, specialized, undergraduate, graduate and above
Your monthly income level:	3000 and below, 3001-5000, 5001-8000, 8001-15000, 15001-30000, 30001 and above
Your permanent residence belongs to:	Cities, towns

Thank you very much for your answer!