



Impact of AI Improving Sichuan Consumer Satisfaction in Online Experience Optimization and Service Efficiency

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Abstract: *This abstract explores the role of artificial intelligence (AI) in enhancing consumer satisfaction in Sichuan's online customer experience and service efficiency. With the rapid growth of e-commerce, understanding consumer preferences and behaviors has become crucial. AI technologies like chatbots, predictive analytics, and personalized recommendations are integrated into online platforms to streamline service delivery and improve user interactions. By leveraging data-driven insights, businesses can tailor their offerings to meet the specific needs of consumers, thereby increasing satisfaction levels. Furthermore, AI facilitates faster response times and more efficient problem resolution, leading to a seamless shopping experience. This study was conducted through an online questionnaire distributed to 380 Sichuan participants to measure their optimization and service efficiency satisfaction. The findings underscore that technical infrastructure, user acceptance and engagement, and service quality positively correlate with consumer satisfaction in AI experience improvement.*

Keywords: *AI, Customer Experience Optimization, Service Efficiency*

1. INTRODUCTION

Integrating artificial intelligence (AI) into the online shopping experience in Sichuan represents a significant advancement in enhancing consumer satisfaction and operational efficiency. As e-commerce rapidly expands, consumers seek personalized and efficient business interactions (Dalle-Nogare & Murzyn-Kupisz, 2021). Traditional customer service methodologies often inadequately address these expectations, leading to consumer frustration and dissatisfaction. AI technologies, including chatbots, predictive analytics, and personalized recommendation systems, present innovative solutions to these challenges. AI-driven chatbots can provide instantaneous responses to customer inquiries, substantially reducing wait times and enhancing the overall efficiency of customer service operations (Li et al., 2024). These systems can manage routine inquiries, enabling human agents to concentrate on more complex issues and elevating the standard of service provided. Moreover, predictive analytics empowers businesses to assess consumer behavior and preferences, facilitating the development of tailored marketing strategies and personalized shopping experiences. Such customization satisfies individual consumer needs and cultivates a deeper connection between consumers and brands (Lee et al., 2022). In addition, implementing AI can streamline various operational processes, thereby improving service efficiency. By automating repetitive tasks and leveraging data-driven insights, businesses can optimize their workflows and lessen operational costs, ultimately enhancing the overall customer experience. The capacity to anticipate customer needs and preferences through AI analytics further amplifies satisfaction as consumers feel acknowledged and valued (Yang et al., 2020).

Research Objectives

This study explores AI improving Sichuan consumer satisfaction in online customer experience optimization and service efficiency with the following objectives:

1. To examine the influencing mechanisms of AI improving Sichuan consumer satisfaction of online customer experience optimization and service efficiency based on technical infrastructure, user acceptance and engagement, and service quality.
2. To offer suggestions for enterprises using AI to improve Sichuan consumer satisfaction by enhancing value and service acceptance in optimization and efficiency.

2. THEORETICAL FOUNDATION

Definition of Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) serves as a crucial framework for examining the role of artificial intelligence (AI) in enhancing consumer satisfaction within the Sichuan online shopping landscape. Central to TAM is the assertion that perceived ease of use and usefulness influence technology acceptance. In AI, consumers are more inclined to engage with tools like chatbots and personalized recommendation systems when perceived as user-friendly and advantageous (Patil, 2024). For instance, AI can significantly improve customer service interactions by delivering immediate responses to inquiries, thereby augmenting perceived efficiency. Consumers' satisfaction levels will likely rise when they experience reduced wait times and practical solutions. Furthermore, as AI systems evolve by learning from consumer behavior, they demonstrate an increased capability to provide customized recommendations, further enhancing the perceived usefulness of these technological solutions (Aldoseri et al., 2023).

Definition of Expectation Confirmation Theory (ECT)

Expectation Confirmation Theory (ECT) serves as a valuable framework for analyzing the enhancement of consumer satisfaction via artificial intelligence (AI) within the online shopping context of Sichuan. According to ECT, consumer satisfaction is predominantly influenced by the discrepancy between pre-purchase expectations and post-purchase experiences. This theory underscores the significance of aligning consumer expectations with the actual performance of AI-driven services. When consumers engage with AI technologies, such as personalized recommendation systems and chatbots, their initial expectations are shaped by prior experiences and marketing communications. If these AI solutions provide timely, relevant, and effective interactions, they will likely confirm consumer expectations, elevating overall satisfaction. For instance, an AI-enhanced chatbot that delivers instant and

accurate responses can substantially reduce wait times, resulting in a more seamless and enjoyable shopping experience (Ezzat et al., 2016).

Definition of Terms

1. Consumer satisfaction in the context of artificial intelligence (AI) and its enhancement of online experiences is a multifaceted concept. It centers on the efficacy with which AI technologies improve interactions between consumers and businesses. AI is integral to optimizing customer experiences by offering personalized services, enhancing response times, and streamlining operational processes. A primary avenue through which AI elevates consumer satisfaction is personalization. AI systems systematically analyze consumer data, including browsing histories and purchasing patterns, to deliver customized recommendations and offers. This degree of personalization fosters a sense of value and understanding among consumers, significantly enhancing their satisfaction levels (Cheng & Jiang, 2022).

2. The technical infrastructure is a fundamental element in facilitating the enhancement of consumer satisfaction through artificial intelligence (AI) in online experiences. This infrastructure comprises the necessary hardware, software, and network resources that support AI applications and ensure their effective operation. A robust technical foundation enables organizations to utilize AI technologies, including machine learning, natural language processing, and data analytics, which are essential for advancing customer interactions. A crucial aspect of this infrastructure is the implementation of data management systems, which enable the collection, storage, and analysis of extensive volumes of consumer data. Organizations can derive valuable insights regarding consumer behavior and preferences by integrating information from diverse sources—such as online transactions, social media interactions, and customer feedback (Flavian et al., 2022).

3. User acceptance and engagement with artificial intelligence (AI) significantly enhance consumer satisfaction in online environments. Consumer satisfaction is defined as the readiness of individuals to adopt and actively interact with AI technologies. Factors influencing user acceptance include perceived usefulness, ease of use, and the overall experience with AI applications. When consumers perceive AI tools—such as chatbots or personalized recommendation systems—as intuitive and advantageous, their likelihood of engaging with these technologies increases, thereby improving overall satisfaction. Engagement is reflected through the consistent utilization of AI features, demonstrating the perceived value of these interactions. This is particularly evident in the frequent use of AI-driven chatbots for customer service and active participation in tailored shopping experiences (Kumar et al., 2019).

4. Service quality in the context of artificial intelligence (AI) improving consumer

satisfaction in online experiences refers to the effectiveness and efficiency of AI-driven interactions that businesses provide to their customers. Several key elements characterize high service quality, including responsiveness, reliability, and personalization. Responsiveness is crucial as consumers increasingly expect immediate assistance. AI technologies like chatbots and virtual assistants can provide 24/7 support, addressing customer inquiries and issues in real time. This capability significantly enhances the customer experience by reducing wait times and ensuring help is available whenever needed. For instance, many consumers prefer interacting with AI for quick responses, highlighting the importance of timely service in achieving satisfaction (Liu et al., 2019).

Conceptual Framework

The conceptual framework connecting technical infrastructure, user acceptance and engagement, service quality, and consumer satisfaction through artificial intelligence (AI) focuses on how these elements interact to enhance online experiences and improve service efficiency. The technical infrastructure is the foundation for AI applications, including the hardware, software, and data management systems necessary for effective AI deployment. A robust infrastructure facilitates the seamless integration of AI technologies, enabling real-time data processing and personalized interactions, which are crucial for enhancing consumer satisfaction. This infrastructure supports collecting and analyzing consumer data, essential for tailoring services to meet individual preferences and needs (Binlibdah, 2024). User acceptance and engagement are critical components of this framework. Consumers are more likely to engage with AI technologies when they find them valuable and easy to use. High levels of user engagement indicate that consumers appreciate AI-driven interactions, leading to increased satisfaction. A user's willingness to adopt AI solutions is influenced by their experiences with these technologies, emphasizing the need for user-friendly interfaces and ensuring that AI applications provide meaningful benefits (Dagar & Ahmad, 2019). Service quality is another vital aspect that correlates with consumer satisfaction. AI can enhance service quality by delivering timely and accurate responses to consumer inquiries, improving responsiveness and reliability. Furthermore, personalized service—driven by AI's ability to analyze consumer data—enhances the quality of interactions (Sands et al., 2021). When consumers receive tailored recommendations and support, they are more likely to feel valued, positively impacting their overall satisfaction.

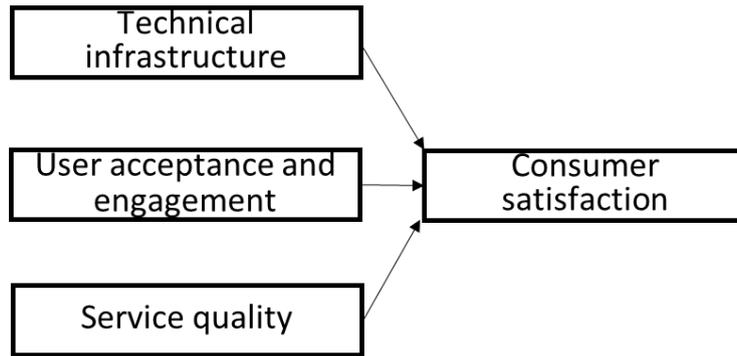


Figure 1. The Conceptual Framework

Research Restriction

One significant restriction is the reliance on data quality and availability. AI systems require large amounts of accurate and relevant data to function effectively. In regions like Sichuan, where data collection practices may not be fully developed or standardized, the effectiveness of AI applications can be compromised. Poor data quality can lead to inaccurate predictions and recommendations, ultimately affecting consumer satisfaction.

3. RESEARCH HYPOTHESIS

The Correlation between Technical Infrastructure and Consumer Satisfaction

The hypothesis concerning the relationship between technical infrastructure and Sichuan consumer satisfaction focuses on enhancing online experiences and service efficiency through artificial intelligence (AI) applications. It can be articulated as follows: The enhancement of technical infrastructure significantly affects consumer satisfaction by improving the efficiency of online services and optimizing the overall customer experience. In Sichuan, where digital transformation is progressing rapidly, integrating robust technical infrastructure, including high-speed internet and efficient data management systems, is imperative. Such infrastructure enables businesses to leverage AI technologies effectively, streamline operational processes, personalize customer interactions, and respond promptly to consumer inquiries. Consequently, consumers are anticipated to experience a more seamless and gratifying online journey. This hypothesis posits a correlation between the quality of technical infrastructure and consumer satisfaction in Sichuan, particularly as businesses strive to enhance online experiences and service efficiency by deploying AI technologies to be explored (Qi et al., 2016).

H1 There is no positive correlation between technical infrastructure and consumer satisfaction regarding optimization and service efficiency in the Sichuan consumer AI experience.

The Correlation between User Acceptance and Engagement and Consumer Satisfaction

The hypothesis about user acceptance and engagement with AI-driven services in Sichuan suggests that higher levels of acceptance and engagement are positively linked to increased consumer satisfaction in online interactions. As businesses adopt AI technologies, consumer willingness to use features like chatbots and personalized recommendations becomes crucial. Engagement rises when consumers find these AI applications beneficial and user-friendly, leading to more frequent interactions. Satisfaction increases when AI systems provide timely and relevant responses, encouraging repeat usage and positive word-of-mouth, which is vital for business growth in e-commerce. This hypothesis highlights the need to evaluate the correlation between AI acceptance, engagement, and consumer satisfaction (Kumar et al., 2023).

H2 There is no positive correlation between user acceptance and engagement and consumer satisfaction regarding optimization and service efficiency in the Sichuan consumer AI experience.

The Correlation between Service Quality and Consumer Satisfaction

The hypothesis regarding the relationship between service quality and consumer satisfaction in Sichuan, especially in the context of optimizing online experiences and service efficiency through the application of artificial intelligence (AI), can be articulated as follows: service quality is positively correlated with enhanced consumer satisfaction on online platforms that leverage AI technologies. In Sichuan's rapidly evolving digital landscape, service quality encompasses responsiveness, reliability, and personalization. As businesses increasingly adopt AI-driven solutions to improve online experiences, a significant enhancement in service quality is anticipated. Notably, AI can facilitate quicker response times and more accurate service delivery, both critical factors influencing consumer satisfaction. Additionally, it is essential to acknowledge AI's impact on enhancing service quality. AI technologies can analyze consumer data, thereby providing personalized recommendations and tailored experiences that contribute to a higher perceived quality of service. This hypothesis emphasizes assessing the relationship between AI-enhanced service quality and consumer satisfaction (Arabelen & Kaya, 2021).

H3 There is no positive correlation between service quality and consumer satisfaction regarding optimization and service efficiency in the Sichuan consumer AI experience.

4. RESEARCH METHODS

Population and Sample

This research population comprises Sichuan and China, focusing on AI optimization and service efficiency. In November 2024, the WeChat Survey Platform collected a sample of

380 for this study's analysis.

This study's minimum research sample size is based on the study of Kadam Bhalerao (2010)

1. The margin of error (confidence interval) – 95%
2. Standard deviation 0.5
3. 95% - Z Score = 1.96
4. Sample size formula = $(Z\text{-score})^2 * Std\ Dev * (1 - StdDev) / (\text{margin of error})^2$
5. $(1.96)^2 * 0.5(0.5) / (0.05)^2$
6. $(3.8416 * 0.25) / 0.0025$
7. $0.9604 / 0.0025 = 384$
8. 384 respondents would be needed for this study based on a confidence level of 95%

5. RESEARCH MODEL

Correlation Analysis

Correlation analysis is widely used to measure the degree of association between different variables. The Pearson correlation coefficient is commonly used to test the correlation. The value of the correlation coefficient (r) indicates the strength of the correlation between variables, while the significance level of the correlation is shown in the P-value.

Table 1. Correlation Coefficient Classification

Correlation coefficient r	Degree of relevance
$ r = 1$	<u>Totally</u> correlated
$0.70 \leq r < 0.99$	<u>Highly</u> correlated
$0.40 \leq r < 0.69$	<u>Moderately</u> correlated
$0.10 \leq r < 0.39$	Low correlation
$ r < 0.10$	Weak or unrelated

Correlation Analysis of Technical Infrastructure and Consumer Satisfaction

The correlation coefficient r between technical infrastructure and consumer satisfaction is 0.811, and P=0.006 is less than 0.01. Thus, technical infrastructure significantly correlates with consumer satisfaction.

Table 2. Correlation analysis results between technical infrastructure and consumer satisfaction

	Technical Infrastructure
Consumer Satisfaction	1
Sig. (1-tailed)	
Technical Infrastructure	.811**
Sig. (2-tailed)	(.006)

Correlation Analysis of User Acceptance and Engagement and Consumer Satisfaction

The correlation coefficient r between user acceptance and engagement and consumer satisfaction is 0.802, and $P=0.007$ is less than 0.01. Thus, user acceptance and engagement significantly correlate with consumer satisfaction.

Table 3. Correlation analysis results between user acceptance and engagement and consumer satisfaction

	User Acceptance and Engagement
Consumer Satisfaction	1
Sig. (1-tailed)	
User Acceptance and Engagement	.802**
Sig. (2-tailed)	(.007)

Correlation Analysis of Service Quality and Consumer Satisfaction

The correlation coefficient r between service quality and consumer satisfaction is 0.789, and $P=0.003$ is less than 0.01. Thus, service quality significantly correlates with consumer satisfaction.

Table 4. Correlation analysis results between Service Quality and Consumer Satisfaction

Consumer Satisfaction Sig. (1-tailed)	
Service Quality Sig. (2-tailed)	
Service Quality	1
	.789** (.003)

6. CONCLUSIONS

Research Results

Research indicates that several key factors, including technical infrastructure, user acceptance and engagement, and service quality, significantly influence consumer satisfaction in artificial intelligence (AI) advancements to optimize online experiences and enhance service efficiency. The technical infrastructure is essential for the successful implementation of AI technologies. A robust infrastructure guarantees that AI systems function effectively, enabling users to experience seamless interactions and prompt responses. This reliability is critical to user satisfaction, as consumers anticipate consistent, high-quality service when interacting with AI-driven platforms (Kang et al., 2017). Moreover, user acceptance and engagement are pivotal for enhancing consumer satisfaction. Individuals who find AI technologies beneficial and user-

friendly are likelier to engage with these systems. Increased engagement promotes familiarity and comfort, which collectively improve overall satisfaction. Research suggests that when users actively participate in AI-driven services, their satisfaction levels elevate as they perceive themselves to be more in control of their interactions and outcomes (Kelly et al., 2022). Furthermore, service quality constitutes another critical factor that correlates positively with consumer satisfaction. High-quality service, characterized by responsiveness, reliability, and personalization, fosters a superior user experience. AI technologies can elevate service quality by providing tailored recommendations and support, increasing consumer satisfaction. When users feel that their needs are adequately understood and addressed, their overall perception of the service improves (Prentice et al., 2020). In conclusion, the interplay among technical infrastructure, user acceptance and engagement, and service quality profoundly impacts consumer satisfaction regarding AI advancements in optimizing online experiences and service efficiency. These components create a positive feedback loop, wherein heightened satisfaction leads to increased usage and acceptance of AI technologies.

H1 There is a positive correlation between technical infrastructure and consumer satisfaction regarding optimization and service efficiency in the Sichuan consumer AI experience.

H2 There is a positive correlation between user acceptance and engagement and consumer satisfaction regarding optimization and service efficiency in the Sichuan consumer AI experience.

H3 There is a positive correlation between service quality and consumer satisfaction regarding optimization and service efficiency in the Sichuan consumer AI experience.

Managerial Implications:

The managerial implications of artificial intelligence's (AI) positive impacts on experience optimization and service efficiency are significant and complex. First, organizations must acknowledge AI's transformative potential in enhancing customer experiences. By leveraging AI technologies, businesses can facilitate personalized interactions catering to individual consumer preferences, increasing satisfaction and loyalty. This requires the strategic integration of AI into customer relationship management systems to analyze consumer data and deliver customized recommendations effectively. Furthermore, AI can improve operational efficiency by automating routine tasks and streamlining processes. Managers should prioritize implementing AI solutions to manage repetitive tasks, allowing human employees to concentrate on more intricate and creative responsibilities. This transition boosts productivity and reduces operational costs, as AI systems can execute tasks at a scale and speed that exceed human capabilities. Consequently, organizations can attain higher levels of efficiency while

ensuring the quality of service delivery. Additionally, applying AI in data-driven decision-making is essential for optimizing business strategies. Managers should harness AI's capacity to analyze extensive datasets to derive insights into market trends and consumer behavior. This data-driven methodology empowers organizations to make informed decisions that align with consumer needs, ultimately enhancing the overall customer experience. Adopting AI tools for predictive analytics enables businesses to anticipate consumer demands and adjust their offerings accordingly, improving service efficiency.

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