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Digital Tourism Service Failures and Quality Assurance Mechanisms: Evidence from Complaint Case Analysis

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Abstract

The rapid development of digital technologies and online platforms has fundamentally transformed tourism services, leading to the emergence of platform-based and data-driven service systems. While existing studies mainly focus on service quality perception and smart tourism development, limited attention has been paid to the structural characteristics of service failures and their governance mechanisms in digital tourism contexts. This study aims to analyze digital tourism service failures and construct a quality assurance mechanism based on empirical evidence. Using 262 valid complaint cases collected from online platforms and public sources, this research applies the SERVQUAL and 5GAP models to classify service failures and identify responsible actors. Descriptive statistics and chi-square analysis are used to examine the relationship between failure types and governance responsibility. The results show that booking and refund failures account for more than 80% of all cases, and online platforms are the dominant responsible actors. The chi-square test confirms a statistically significant association between failure types and responsible actors. Based on these findings, a mechanism framework linking service failures, quality gaps, and governance mechanisms is proposed. This study contributes to the literature by shifting the focus from service quality perception to service failure structure and provides practical implications for improving digital tourism governance and service quality assurance.

For citation

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Keywords

Digital tourism, tourism service quality, service failure, SERVQUAL, quality assurance mechanism, online platforms, quality management.

Introduction

The rapid development of digital technologies has significantly reshaped the tourism industry, promoting the emergence of smart tourism and platform-based service systems. Digital tools such as online booking platforms, mobile applications, and data-driven services have improved tourism efficiency and accessibility, but they have also introduced new forms of service failures and governance challenges [Gretzel, Sigala, Xiang, Koo, 2015; Gretzel, Reino, Kopera, Koo, 2015; Zhang, Wang, 2020].

Existing research has primarily focused on tourism service quality from the perspective of customer perception and satisfaction. The SERVQUAL model has been widely applied to evaluate service quality in tourism and hospitality contexts, emphasizing the importance of reliability, responsiveness, and service delivery consistency [Sun, 2023; Chen, 2022; Parasuraman, Zeithaml, Berry, 1988]. At the same time, studies on service quality improvement highlight the role of gap analysis and service management strategies in reducing discrepancies between expected and perceived service quality [Zuo, 2021; Li, Yang, 2022].

With the development of digital tourism, online platforms have generated large volumes of user-generated content, providing new data sources for analyzing service quality. Online reviews and complaint data have been widely used to examine customer satisfaction and service problems, particularly in cases involving service failure and recovery processes [Gou, Xu, Xu, 2021; Liang, 2022; Chatterjee, 2001]. Compared with traditional survey-based methods, complaint data provide more direct evidence of service breakdowns and governance deficiencies.

However, despite the growing literature, several limitations remain. First, most studies focus on service quality perception rather than structural analysis of service failures. Second, smart tourism research emphasizes technological innovation while neglecting governance mechanisms and accountability issues [Gretzel et al., 2015a; Gretzel et al., 2015b]. Third, there is a lack of integrated analytical frameworks linking service failure types, responsibility attribution, and quality assurance mechanisms.

To address these gaps, this study analyzes digital tourism service failures based on empirical data and proposes a mechanism-based framework for service quality assurance. By integrating the SERVQUAL and 5GAP models with case-based analysis, this research aims to identify key failure patterns, examine the relationship between failure types and responsible actors, and provide governance-oriented insights for improving digital tourism service systems.

Literature Review

Tourism Service Quality and SERVQUAL Applications

Tourism service quality has been extensively studied using the SERVQUAL model and its extensions. SERVQUAL evaluates service quality based on multiple dimensions, including reliability, responsiveness, assurance, empathy, and tangibles, and has been widely applied in tourism and hospitality research [Parasuraman, Zeithaml, Berry, 1988].

Previous studies have extended SERVQUAL to specific tourism contexts. Research on tourism logistics service quality shows that service gaps often arise from inconsistencies between expected and delivered services, particularly in complex service systems [Sun, 2023]. Similarly, studies in the hotel industry emphasize that service quality is closely related to communication and response mechanisms, especially in the context of customer feedback and complaint handling [Chen, 2022].

In addition, the 5GAP model has been widely used to analyze service quality deficiencies and

identify sources of service failure. Studies indicate that service quality gaps are often caused by misalignment between management perception, service delivery, and customer expectations [Zuo, 2021; Li, Yang, 2022]. These findings provide a theoretical basis for analyzing service failures and improving service quality.

Smart Tourism and Digital Service Systems

With the advancement of digital technologies, smart tourism has become an important research field. Existing studies show that digital infrastructure, intelligent systems, and data integration play a crucial role in enhancing tourism experiences and destination competitiveness [Gretzel et al., 2015a; Zhang, Wang, 2020].

From the perspective of tourist perception, smart tourism development improves destination image by enhancing information accessibility and service efficiency [Li, 2022]. At the same time, international studies highlight that smart tourism systems rely heavily on digital platforms and data coordination, which increases system complexity and introduces risks such as service disruption, information asymmetry, and governance challenges [Gretzel et al., 2015a; Gretzel et al., 2015b].

Moreover, digital transformation reshapes traditional service relationships, shifting tourism services toward platform-based ecosystems. In such systems, multiple actors interact, making responsibility identification and service coordination more complex [Gretzel et al., 2015b; Sun, Xu, 2021; He, 2023].

Online Reviews and Service Failure Analysis

The widespread use of online platforms has led to the rapid growth of user-generated content, which provides new data sources for analyzing tourism service quality. Online reviews and complaint data are increasingly used to examine customer satisfaction and service problems [Gou, Xu, Xu, 2021; Chatterjee, 2001].

Compared with traditional survey methods, complaint data capture real service conflicts, including booking failures, refund disputes, and communication breakdowns. These data reflect actual service failures and provide valuable insights into service delivery problems and governance deficiencies [Gou, Xu, Xu, 2021; Liang, 2022].

Research also shows that negative online reviews significantly influence consumer perception and decision-making, highlighting the importance of service recovery and response strategies [Liang, 2022; Chatterjee, 2001]. However, most existing studies focus on sentiment analysis or destination image, while fewer studies systematically classify service failures or analyze responsibility distribution.

Research Gap

Based on the above review, several research gaps can be identified.

First, although SERVQUAL and related models provide a solid theoretical foundation, existing studies mainly focus on perceived service quality rather than failure structures [Sun, 2023; Chen, 2022; Parasuraman, Zeithaml, Berry, 1988].

Second, smart tourism research emphasizes technological innovation but lacks sufficient analysis of governance mechanisms and service failures [Gretzel et al., 2015a; Gretzel et al., 2015b; Zhang, Wang, 2020].

Third, although online data sources are widely used, there is still a lack of integrated frameworks linking service failure types, responsible actors, and quality assurance mechanisms [Gou, Xu, Xu, 2021; Liang, 2022; Chatterjee, 2001].

To address these gaps, this study adopts a service failure perspective and integrates the SERVQUAL and 5GAP models into an empirical analytical framework. By analyzing digital tourism service failure cases, this research aims to identify key governance problems and propose a mechanism-based approach to improving service quality in digital tourism systems.

Methodology

Data Sources and Collection

The empirical analysis of this study is based on complaint cases related to digital tourism service failures. The data were collected through three rounds of web-based searches, including online complaint platforms, public service feedback systems, and tourism-related online discussions.

A set of keywords related to booking failures, refund disputes, system malfunctions, and complaint issues was used to retrieve relevant cases. In total, 699 raw cases were collected.

To ensure data reliability, a multi-stage screening process was applied. Duplicate records, invalid links, irrelevant cases, and incomplete complaint descriptions were removed. After screening, 262 valid cases were retained for further analysis.

Data Processing and Coding

The collected cases were transformed into a structured dataset through a coding process. Each case includes information such as complaint content, failure type, responsible actor, and contextual characteristics.

Based on the SERVQUAL and 5GAP frameworks, service failures were classified into five categories:

– Booking/Technical Failure
– Refund/Cancellation Failure
– Responsibility Shifting
– Complaint Response Failure
– Other Governance Issues

In addition, responsible actors were identified and categorized into four groups:

– Online Platform
– Scenic Spot
– Regulatory Authority
– Unidentified

The coding process combined manual interpretation with rule-based classification to ensure consistency across observations.

Analytical Methods

This study employs a combination of descriptive and inferential statistical methods.

Descriptive statistics are used to analyze the distribution of service failure types and responsible actors. Cross-tabulation analysis is applied to examine the relationship between failure categories and responsibility attribution.

Furthermore, a chi-square test of independence is conducted to test whether there is a statistically significant association between failure types and responsible actors. Cramer's V is used to measure the strength of the relationship.

Finally, based on the SERVQUAL and 5GAP models, a mechanism mapping between service failures, quality gaps, and governance mechanisms is developed.

Empirical Results

Data Sources and Sample Formation

The empirical analysis is based on a dataset of digital tourism service failure cases collected from publicly available online sources. The data were obtained through three rounds of collection, including

online complaint platforms, social media reports, and publicly disclosed consumer rights protection cases.

In total, 699 raw cases were initially identified. To ensure the reliability and validity of the dataset, a multi-stage screening procedure was applied. Duplicate records, invalid links, irrelevant cases, and incomplete complaint narratives were excluded. As a result, 262 valid cases were retained for further analysis.

The screening process is presented in Figure 1.

Figure 1 – Process Diagram of Screening Cases of Digital Tourism Service Failures (699 → 262)

The final sample provides a structured representation of digital tourism service failures, including information on failure types, responsible actors, and contextual characteristics.

Analytical Framework and Variable Definition

The classification of service failures is grounded in the theoretical framework of the 5GAP model, which enables a systematic interpretation of discrepancies in service delivery and governance.

Based on the coding results, all cases were categorized into five types of digital tourism service failures:

(1) booking failure,

(2) refund failure,

(3) responsibility shifting,

(4) complaint response failure, and

(5) other governance-related issues.

In addition, each case was assigned to a responsible actor category, including online platforms, scenic spots, regulatory authorities, and unidentified actors.

The coding process combined manual interpretation of complaint narratives with rule-based classification procedures to ensure consistency across observations.

Descriptive Analysis of Service Failures

Distribution of Failure Types

The distribution of service failure types is illustrated in Figure 2.

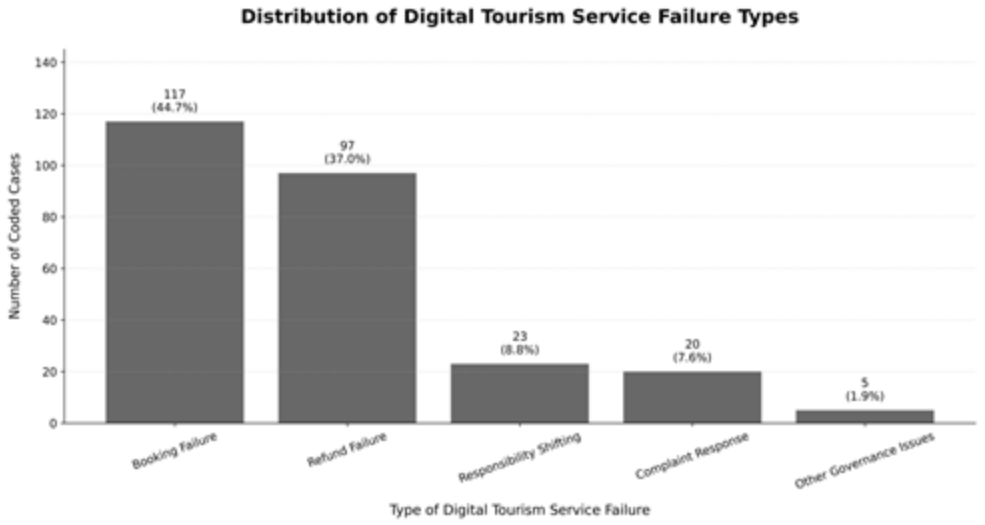

Figure 2 – Distribution of Failure Types in Digital Tourism Services

The results indicate a highly uneven distribution. Booking failures account for 44.7% of all cases, while refund failures represent 37.0%. Together, these two categories constitute more than 80% of the total sample.

This finding suggests that digital tourism service failures are primarily concentrated in transactional and post-transactional processes, rather than in on-site service delivery.

Distribution of Responsible Actors

The distribution of responsible actors is presented in Figure 3.

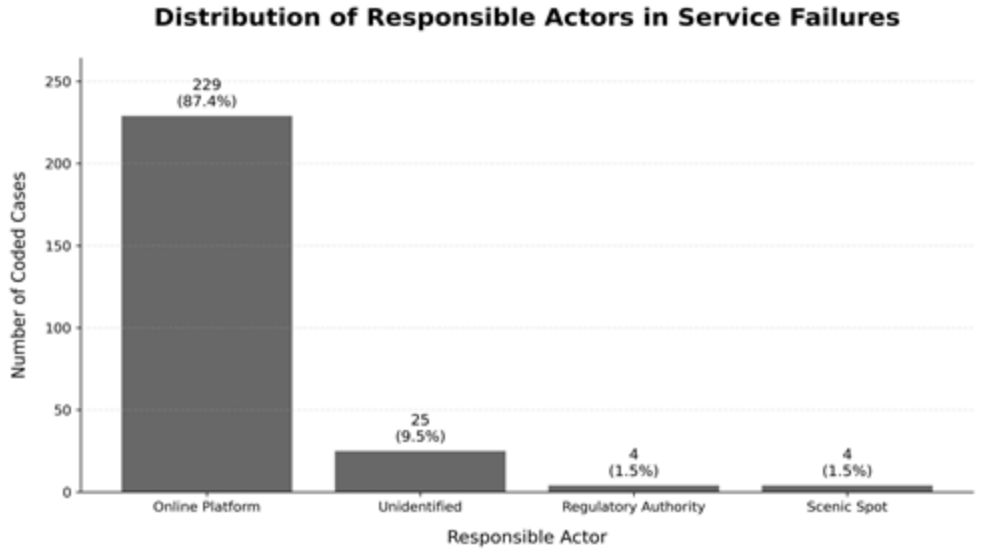

Figure 3 – Distribution of Responsible Entities for Failures in Digital Tourism Services

The results show that online platforms are identified as responsible in 87.4% of cases, significantly exceeding other actors. Scenic spots and regulatory authorities account for only a small proportion of failures.

This pattern indicates that platform-based service systems play a dominant role in shaping the quality of digital tourism services.

4.3.3 Cross-Analysis of Failure Types and Responsibility

The relationship between failure types and responsible actors is presented in Figure 4.

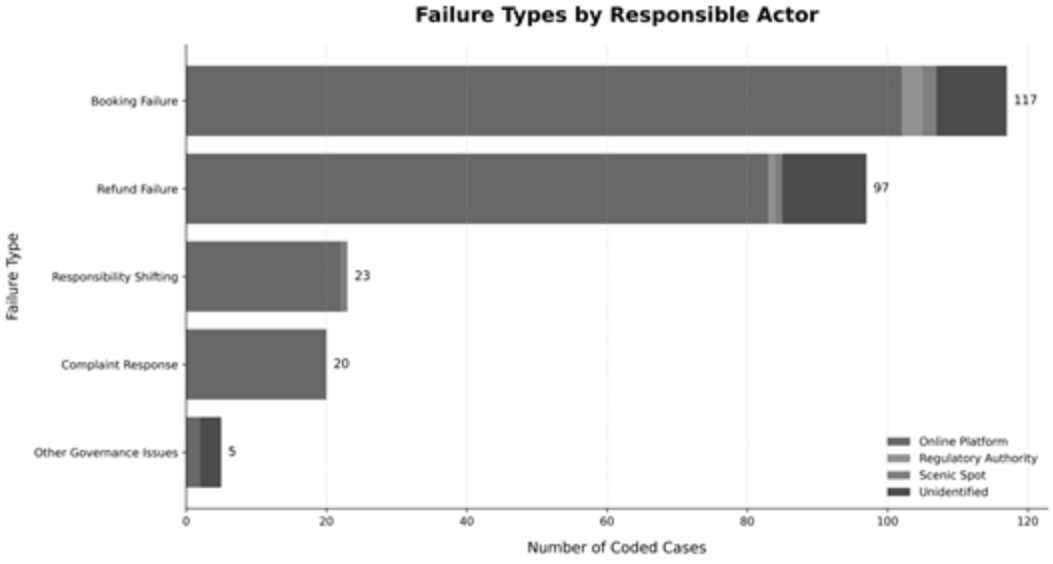

Figure 4 – Comparative Analysis of the Relationship Between Failure Types and Responsible Entities

The results reveal a clear structural pattern. Booking and refund failures are predominantly associated with online platforms, while responsibility shifting cases reflect more complex interactions among multiple actors.

Overall, the findings suggest that service failures are systematically linked to the operational characteristics of digital platforms rather than occurring randomly across different actors.

Spatial Distribution of Service Failures

The spatial distribution of service failures across major tourist attractions is shown in Figure 5.

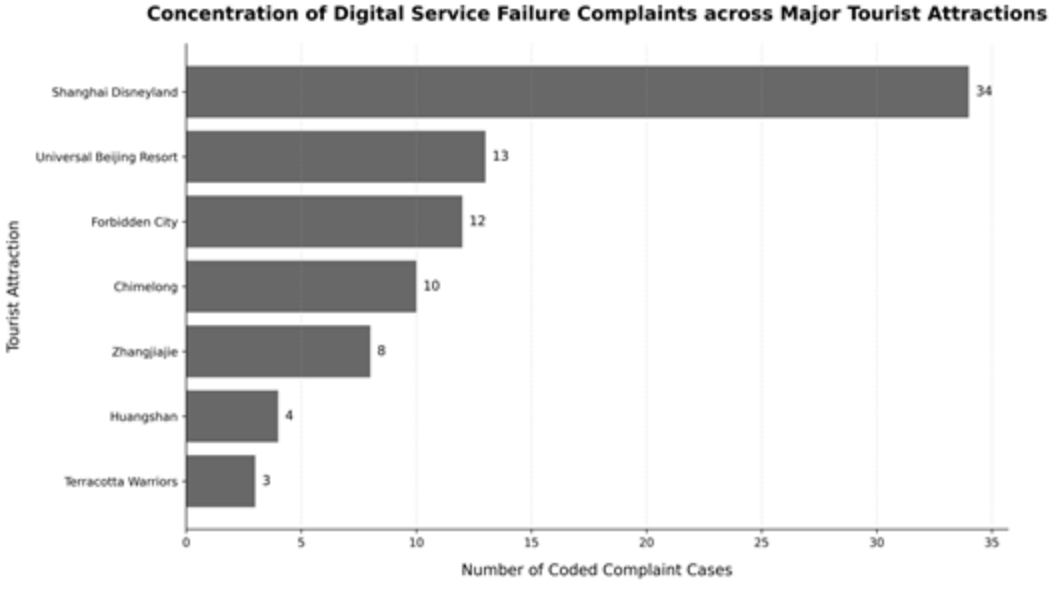

Figure 5 – Spatial Distribution of Digital Tourism Service Failures by Tourist Attractions

The results indicate that complaints are concentrated in large-scale tourist destinations with high visitor volumes and advanced digital service systems.

This reflects a scale-dependent pattern in which increased digitalization and transaction intensity are associated with higher exposure to service failure risks.

Statistical Association between Failure Types and Responsible Actors

To examine whether service failure types are statistically associated with responsible actors, a chi-square test of independence was conducted.

The test results are as follows:

$\chi^2 = 23.721$, $p = 0.022$, $df = 12$.

Since the p-value is below the conventional significance level of 0.05, the null hypothesis of independence is rejected. This indicates that there is a statistically significant association between failure types and responsible actors.

At the same time, the calculated value of Cramer's V (0.174) suggests that the strength of the association is relatively weak. This implies that, although certain failure types are more likely to be associated with specific actors, the relationship is not strongly deterministic.

Mechanism Interpretation Based on the 5GAP Framework

The mapping between service failure types, quality gaps, and governance mechanisms is presented in Figure 6.

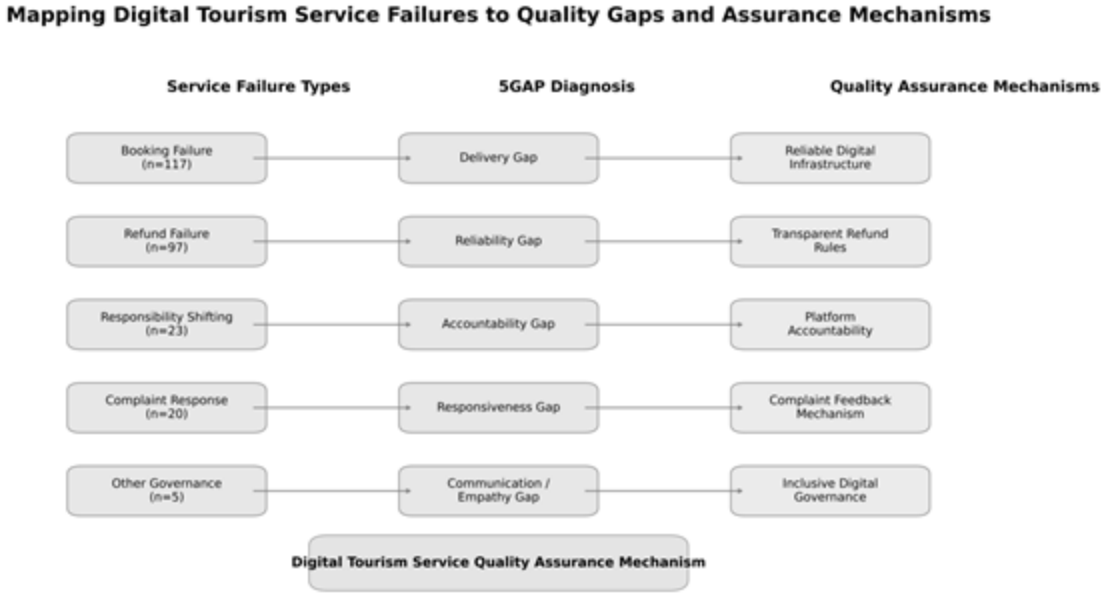

Figure 6 – Relationship Between Types of Digital Tourism Service Failures, Quality Gaps, and Governance Mechanisms

The results show that different types of service failures correspond to distinct gaps in service quality:

– Booking failures are related to delivery gaps

– Refund failures reflect reliability gaps

– Responsibility shifting indicates accountability gaps

– Complaint response failures correspond to responsiveness gaps

– Other issues are associated with communication and empathy gaps

This mapping demonstrates that digital tourism service failures can be understood as manifestations of systematic governance deficiencies rather than isolated incidents.

Summary of Empirical Findings

The empirical results lead to three main conclusions.

First, service failures are highly concentrated in booking and refund processes, indicating structural weaknesses in transactional systems.

Second, online platforms constitute the primary responsible actors, highlighting the central role of platform governance.

Third, the observed failure patterns correspond to identifiable quality gaps, suggesting that targeted governance mechanisms are necessary to improve service quality in the digital tourism sector.

Discussion

The empirical results reveal several important insights into digital tourism service failures and their governance implications.

First, service failures are highly concentrated in booking and refund processes. This finding suggests that the core weaknesses of digital tourism services lie in platform-mediated transactional systems rather than in traditional on-site service delivery. The high proportion of booking and refund failures reflects the increasing dependence on digital platforms and the vulnerability of system-based service operations.

Second, online platforms are identified as the dominant responsible actors. This result highlights the central role of platforms in coordinating tourism services and managing service quality. However, it also indicates that platform governance mechanisms remain insufficient, particularly in areas such as system reliability, transaction transparency, and dispute resolution.

Third, the chi-square test confirms a statistically significant relationship between failure types and responsible actors. Although the strength of the association is relatively weak, the result suggests that different types of service failures are not randomly distributed but are structurally linked to specific governance issues.

These findings are consistent with previous studies on service quality and digital tourism, which emphasize the importance of service coordination, communication, and responsiveness [Chen, 2022; Gretzel et al., 2015a; Liang, 2022]. At the same time, this study extends existing research by shifting the analytical focus from service quality perception to service failure structures and governance mechanisms.

Furthermore, the mapping between service failures and the 5GAP framework provides a systematic explanation of service quality deficiencies. Booking failures reflect delivery gaps, refund failures indicate reliability gaps, responsibility shifting reveals accountability gaps, and complaint response failures correspond to responsiveness gaps.

Overall, the results suggest that digital tourism service failures are not isolated incidents but manifestations of systemic governance problems. Effective quality assurance therefore requires a transition from reactive problem-solving to proactive governance mechanisms.

Conclusion

This study investigates digital tourism service failures and proposes a mechanism-based framework for service quality assurance. Based on 262 complaint cases, the empirical analysis identifies the main

types of service failures, examines responsibility distribution, and tests the relationship between failure types and responsible actors.

The results show that service failures are highly concentrated in booking and refund processes, and online platforms play a dominant role in service delivery and governance. The chi-square test confirms a significant association between failure types and responsibility attribution, indicating the existence of structural patterns in digital tourism service failures.

By integrating the SERVQUAL and 5GAP models, this study constructs a framework linking service failures, quality gaps, and governance mechanisms. This framework provides a systematic approach to understanding and improving service quality in digital tourism systems.

This study contributes to the literature by introducing a failure-based perspective to tourism service quality research and by highlighting the importance of platform governance in digital environments.

However, this research also has limitations. The dataset is based on publicly available complaint cases and may not fully represent all service failure situations. Future studies can expand the data sources and apply more advanced analytical methods to further examine digital tourism service systems.

In conclusion, improving digital tourism service quality requires not only technological innovation but also effective governance mechanisms, platform accountability, and responsive service management.

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Сбои в цифровых туристских услугах и механизмы обеспечения качества: по материалам анализа жалоб потребителей

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Аннотация

Стремительное развитие цифровых технологий и онлайн-платформ коренным образом трансформировало сферу туристских услуг, способствуя формированию платформенных и основанных на данных сервисных систем. Несмотря на то, что существующие исследования преимущественно сосредоточены на восприятии качества услуг потребителями и развитии концепции «умного туризма», структурным характеристикам сбоев в предоставлении услуг и механизмам их регулирования в условиях цифрового туризма уделяется недостаточное внимание. Цель данного исследования заключается в анализе сбоев цифровых туристских услуг и разработке механизма обеспечения качества на основе эмпирических данных. В исследовании использованы 262 валидных случая жалоб, собранных на онлайн-платформах и из открытых источников. Для классификации типов сбоев и выявления ответственных субъектов применены модели SERVQUAL и 5GAP. Для изучения взаимосвязи между типами сбоев и ответственностью участников системы управления использованы методы описательной статистики и χ^2-анализ. Результаты исследования показывают, что более 80 % всех случаев приходится на сбои, связанные с бронированием и возвратом денежных средств, при этом основными ответственными субъектами выступают онлайн-платформы. Результаты критерия χ^2 подтверждают наличие статистически значимой связи между типами сбоев и ответственными участниками. На основе полученных результатов предложена концептуальная модель, связывающая типы сервисных сбоев, разрывы качества услуг и механизмы управления качеством. Научный вклад исследования заключается в смещении акцента с оценки воспринимаемого качества услуг на анализ структуры сервисных сбоев. Полученные результаты имеют практическое значение для совершенствования механизмов управления цифровым туризмом и обеспечения качества туристских услуг.

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Ключевые слова

Цифровой туризм, качество туристских услуг, сбои в предоставлении услуг, SERVQUAL, механизм обеспечения качества, онлайн-платформы, управление качеством.

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