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A Study on Tourist Satisfaction Based on the Conservation and Reuse of Alleyway Spaces in Urban Historic Neighborhoods

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Abstract: The preservation and reuse of historical alley spaces infuse these areas with renewed vitality, which holds significant importance for the direction of preservation and restoration efforts in historical districts. This paper focuses on Jinyu Alley in Quanzhou and identifies a study targeting tourists for the protection and reuse of historical alley spaces. Through preliminary research and interviews, a system of evaluation indicators for urban historical alley spaces post-usage was established using a factor analysis, extracting five main components: historical context, neighborhood space, commercial environment, supporting facilities, and operational management. Additionally, a modified importance–performance analysis (IPA) method was employed to conduct a quadrant analysis on tourist satisfaction evaluation indicators. Transformation quadrant distribution maps of various evaluation indicators reveal dissatisfaction among tourists with certain aspects of supporting facilities, the commercial environment, and neighborhood space. Relevant departments should prioritize improvements in dining quality, business variety, neighborhood traffic connections and transformations, neighborhood space form and scale, landscape greening, environmental elements, parking availability, and trash bin density for future enhancements. Finally, based on the results of tourist satisfaction surveys and information gathered from interviews with a minority of residents, a more inclusive and sustainable strategy for the protection and reuse of historical alley spaces is formulated.

Keywords: historical alleys; factor analysis; tourist satisfaction; evaluation index; modified IPA method; sustainable development

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1. Introduction and Purpose of the Study

With the development of the modernization process, the transformation of historical neighborhoods has consistently been influenced by the reorganization of spatial configurations or demands for "modernization". In spaces where tradition coexists with modernity, old and new buildings intertwine, leading to the gradual loss of local memory and the vitality of historical streets. Therefore, it becomes especially important to carry out the protection and utilization of historical sites in a reasonable manner while preserving historical context [1].

Internationally, the protection system for historical districts can be divided into three stages: "preservation", "protection", and "safeguarding" (see Table 1). The "preservation" ideology began with France's issuance of the "Historical Monuments Law" and the "Landscape Protection Law" from 1913 to 1930. The "Venice Charter", enacted in 1964, broke away from the protection of individual cultural relics and advocated for the protection of the surrounding "urban or rural environments with unique civilizations and historical significance" of "historical sites". The "protection" ideology, marked by the "Amsterdam Declaration (1975)" issued by the European Parliament, pioneered holistic conservation strategies and emphasized integrating heritage into social life. This concept significantly propelled the shift in protection ideology from "static preservation" to "dynamic utilization" [2]. The "Nairobi Recommendation" in 1976 further expanded the connotation of

protection, explicitly stating the functions and values of protecting historical districts [3]. Recognizing this, many countries began to research the protection and development of urban historical districts, expanding the scope of protection from individual historical traditional buildings to collective historical traditional buildings [4]. In 1987, the "Washington Charter" proposed comprehensive sustainable development for historical towns and regions. Subsequently, major heritage conservation agencies began using the term "protection", encouraging heritage reuse and promoting local socio-economic development [5]. The "maintenance" ideology, with the popularization of sustainable development ideas, began with the proclamation of the "Beijing Charter" in 1999, indicating that the concept of a habitat environment was proposed from the perspective of sustainable development, advocating for the integration of new area planning and design, old city renovation, and renewal into a dynamic circular system. The "Xi'an Declaration" in 2005 mentioned the protection of cultural heritage, including intangible cultural heritage [3]; in 2011, UNESCO issued the "Recommendation on the Historic Urban Landscape", breaking through the traditional scope of "material preservation" and aiming to integrate heritage protection with the goals of social and economic development to promote the comprehensive sustainable development of heritage sites. In the same year, ICOMOS issued the "Valletta Principles", emphasizing the term "safeguarding", focusing on maintaining the functional diversity and community vitality of heritage sites through auxiliary intervention measures [6].

Table 1. International Documents on the Conservation and Revitalization of Historic Cultural Districts. (Source: self-drawn by the author).

Phase	Time	Document	Related Content
Preservation	1913	Historical Monuments Law	It comprises four aspects: the definition and classification of historical relics; the protection and restoration of historical relics; the registration and management of historical relics; and the utilization and opening of historical relics.
	1930	Landscape Protection Law	Provinces are required to establish a system for registering key natural monuments and historical relics for protection. Once included in the heritage list, they shall not be arbitrarily damaged or altered in appearance without approval from the Ministry of Culture.
	1964	Venice Charter	Encouragement is given for urban development and construction, along with the stipulation of principles for building and land use. Emphasis is placed on the importance of environmental protection, and measures for conserving natural resources and ecological environments are outlined.
Protection	1975	Amsterdam Declaration	The preservation and enhancement of architectural heritage are inseparable from the economic, social, and cultural factors that constitute its environment.
	1976	Nairobi Recommendation	Encouraging frozen protection akin to museums is not advocated; instead, the preservation of historical areas is considered an integral part of urban development strategy.
	1987	Washington Charter	The significance and role of protecting historical districts, as well as larger historical towns, and the principles and methods of conservation in urban areas have been defined.

Table 1. *Cont.*

Phase	Time	Document	Related Content
Safeguarding	1999	Beijing Charter	The construction of human settlements emphasizes the integration of technology and humanities, as well as the multi-layered technical construction, ultimately leading to the integration of architecture, landscape architecture, and urban planning.
	2005	Xi'an Declaration	The scope of cultural heritage conservation extends to the surrounding environment and encompasses all historical, social, spiritual, customary, economic, and cultural activities within that environment. Emphasizing the spiritual and humanistic aspects, it encompasses not only the surrounding physical environment but also intangible cultural heritage, such as customs and traditions embedded in history.
	2011	Recommendation on the Historic Urban Landscape	Taking a dynamic perspective on human activities in urban spaces across different periods and considering it as a comprehensive system, it provides insights into urban cultural heritage. This approach emphasizes both historical contexts and contemporary developments.
	2011	Valletta Principles	Maintenance of historical towns, urban areas, and their surrounding environments involves implementing necessary procedures for their protection, preservation, enhancement, and management, as well as ensuring their coherent development and harmonious adaptation to contemporary life.

In 2016, the UNESCO Global Report "Culture: Urban Future" proposed that "alleys, create and transmit a sense of place for the next generation, providing spatial support for the social activities of storytelling, performing arts, rituals, and other activities passed down through generations, collectively presenting urban identity" [7]. Traditional street spaces in China's historic cultural towns occupy specific temporal and spatial positions, possessing a certain system, diverse functionalities, and primarily linear layouts. These historical streets serve as hubs for facilities, fostering community interaction, linking various material and immaterial elements, and cultivating localized street "scenes" that attract pedestrian flow and industries, leading to investment, consumption, and economic growth. They also serve transportation functions. Consequently, from economic, social, and cultural perspectives, traditional historical street spaces in China hold extremely significant value for preservation [8]. Therefore, historical streets and alleys constitute crucial components of the historical and cultural heritage protection system. With urban renewal, the contradictions between modernization and neighborhood alleys become increasingly prominent: street and alley spaces are narrow, infrastructure is outdated, landscapes are lacking, and the environment continues to deteriorate, leading to numerous environmental and health hazards and a continuous loss of original residents. To address this phenomenon, the government begins to transform traditional historical neighborhood alleys [9]. Initially, traditional historical neighborhoods and alleys often face two types of destruction to varying degrees: constructive destruction, involving demolition, and protective destruction, achieved through constructing antique buildings to restore history. However, neither type of destruction or repair significantly contributes to the inheritance of history and context. After land and housing system reforms, commercial and tourism development in historical areas became the focus of research. With the rapid growth of the tourism industry and the highlighting of land values in central urban areas, the new concept of "protection and reuse as economic development" gradually gained acceptance among local decision-makers. The formerly formulaic approach of large-scale demolition, relocation, and reconstruction of historical neighborhoods has recently been replaced by

more subtle protective methods [10]. Taking the Kuanzhai Alley area in Chengdu as an example, protection measures are implemented through property rights exchange, guiding original residents to relocate while maximizing the preservation of core area buildings and restoring them according to their original features. This approach, based on the principle of "preserving the old as it was", tightly integrates traditional customs with market development [11]. The aesthetic value of neighborhood alleys offers people different spatial experiences, forming an aesthetic contrast with modern high-rise buildings. Through these alley spaces, one can observe the historical architectural layout and spatial forms of the site [12]. The protection and reuse of historical streets and alleys not only involve restoring the original site but also infusing them with new functions, maximizing various values, and carrying constructive significance for the entire neighborhood and ancient city.

Currently, in terms of sustainable development, the tourism industry is closer to social justice than other economic sectors [13]. One of the pillars of tourism development is tourism demand, which has a complex structure, and the contribution of tourism revenue depends on various factors. Customer satisfaction is one of the most important factors in ensuring future profit growth. Nowadays, many organizations have regarded customer satisfaction as an important standard for measuring their work quality [14]. Given the importance of the tourism industry in the modern economy and its growing contribution, the importance of customer satisfaction is evident [15]; therefore, it is more necessary to plan to strengthen tourism infrastructure, improve the quality of tourist services and facilities. In comparison to Western preferences for natural landscapes and participation in outdoor activities, Chinese tourists prefer cultural attractions and experiencing local life, such as historical neighborhoods and alley spaces [16]. Good neighborhood quality includes not only high levels of public services but also unique architectural styles, beautiful ecological environments, and convenient street facilities, all of which can provide a comfortable tourist experience, increase attractiveness to tourists, significantly enhance urban tourism appeal, and strengthen competitiveness in industries such as tourism [17]. Therefore, the issue of the regeneration of historical neighborhood alleys must be based on the transformation of historical street environments and combined with various considerations, such as the protection and utilization of urban cultural resources to fully tap into the vitality of each historical street and alley, in order to attract tourists and, through the consideration of tourist satisfaction evaluations, to achieve the goal of effectively revitalizing historical areas.

In academic research on the transformation of historical urban neighborhood spatial forms in China, the social dimension is often completely overlooked or under-researched compared to the physical and spatial dimensions, with very few discussions on the transformation of neighborhood spatial forms from the perspective of users' post-use evaluations [18]. To address this gap in the literature, this study proposes 23 evaluation indicators for historical neighborhood alleys based on a tourist perspective. In order to validate the rationality of the transformation of historical areas, the theory of post-use evaluation is introduced to assess whether the transformed historical neighborhoods can meet the various behavioral usage needs of tourists [19]. Therefore, the level of tourist satisfaction scores can relatively intuitively reflect the situation of the transformation of historical neighborhoods and also indirectly indicate the level of competitiveness of these historical neighborhoods. However, considering the subjectivity of tourist evaluations, which may affect the authority and credibility of the evaluation results, this paper adopts a modified importance–performance analysis (IPA) method, extending the importance to implicitly derived importance, to more accurately reflect the true importance assessment.

2. Literature Review

2.1. Research on the Conservation and Reuse of Historic Districts

The preservation and revitalization of historical cultural neighborhoods abroad originated from urban conservation in the late 18th century. After a century of development since the mid-19th century, various charters and laws gradually emerged, accompanied by

the emergence of various preservation theories. Scholars both domestically and abroad have shown two common trends in the research and practice of historical cultural neighborhoods: the preservation trend has shifted from the original focus on updating and developing the protection of historical neighborhoods and exploring the spatial forms [20,21], texture [22], and structure [23] of historical neighborhoods at the material environmental level to the regional studies of urban memory [24], regional culture [25,26], historical streets and alleys [27], and regionally oriented research on cultural environmental aspects and human-centered non-material aspects, emphasizing cultural heritage. In terms of preservation methods, an increasing number of scholars are using visualization analysis software for more accurate quantitative assessments, guiding the renewal and activation of historical cultural neighborhood spaces.

Initially, research on historical neighborhood spaces predominantly focused on the material aspects, with topics such as "renewal", "urban morphology", and "spatial forms". For instance, Zhang Jingyu et al. analyzed the relationship between urban fabric, transportation, and land-use patterns using space syntax, providing a better understanding of the relationship between street structure and function [28]. Zhou Xuewen et al. used methods such as kernel density estimation, standard deviation ellipses, network analysis, inverse distance weighting, and spatial correlation analysis to analyze the scale and accessibility of cultural relics (CRHS) and surrounding commercial facilities [29]. Tutuko, Pindo, and others discussed the contribution of a road network spatial structure to the sustainability of historical cities [30]. Xu Yabing et al. used space syntax, visualization charts, and survey analysis to analyze the spatial identification of public spaces in historical neighborhoods [31]. During this period, scholars mainly focused on the material aspects, proposing new theoretical protection models and studying the mechanisms of spatial form evolution and optimization strategies, providing theoretical guidance for the practice of protecting and reusing historical neighborhoods.

As the purpose of historical neighborhood reuse shifts from neighborhood protection to meeting social needs, the public has become the main subject for evaluating the protection and reuse of historical neighborhoods, with the opinions of tourists, residents, and others forming a significant part of these evaluations. During this period, research on historical neighborhoods shifted towards non-material aspects. For example, Dai Linlin and others used qualitative research methods to explore the views of local residents on the tourism development of historical neighborhoods [32]. Zhu Xiaoyang et al. proposed a conceptual model of the relationship between tourist landscape evaluation, destination images, place attachment, and Taiwan's Taiping Old Street [33]. Feng Liang et al. focused on the integration and development of historical neighborhood cultural landscapes and tourism, constructing a more sustainable framework for urban historical neighborhood renewal and development [34]. Pezeshki, Fereshteh, and others surveyed the support of Iranian small heritage site communities for sustainable tourism development, proposing a paradigm model based on social constructionist framework and grounded theory methods, and for the first time, they identified the dimensions of the core phenomenon "community SSTD (community support for sustainable tourism development)" in small heritage sites [35]. During this period, scholars' research expanded from studying the material spatial environment solely to including non-material aspects, such as historical neighborhood cultural genes, vitality enhancement, and value reshaping, providing optimization suggestions and directions for the subsequent evolution and design transformation of historical neighborhoods.

Currently, international research on historical neighborhoods is rich and diverse, covering aspects such as morphological characteristics and development strategies, protection and renewal, cultural inheritance, and vitality enhancement in depth. While qualitative analysis remains the dominant research method, quantitative analysis is gradually increasing. The focus has shifted from the buildings themselves to the subjective experiences of the public, emphasizing the importance of people-centered approaches. This indicates

that future transformations of historical neighborhoods should not only meet the needs of residents but also consider the feelings of tourists to achieve high-quality construction.

2.2. Theory of Post-Occupancy Evaluation in Historical Alleyways Studies

Post-occupancy evaluation (POE) emerged in the 1960s, rooted in disciplines such as environmental psychology and behavioral science. Its first practical application involved the systematic evaluation of university dormitories from the users' perspective by Sindell and Hays [36]. Since then, POE has evolved into a relatively mature theory in the study of spatial environments, transitioning from initially focusing on the post-occupancy evaluation of public buildings to broader applications encompassing not just individual structures but entire residential areas, streets, alleys, and even larger regions. In the field of architecture, POE examines both the objective environment and subjective psychological experiences, employing a combination of qualitative and quantitative research methods to ensure the scientific rigor and reliability of its findings.

Influenced by diverse perspectives on environmental assessments, many experts and scholars have developed comprehensive and scientifically viable evaluation theories and systems. Rutledge, Albert J. advocated for a user-centric approach, emphasizing the understanding of user behavior needs before design and capturing post-use evaluation feedback afterward [37]. Bechtel, Robert B. and others summarized 14 evaluation methods based on usage behavior and psychology, laying a solid foundation for subsequent research [38]. Preiser, Wolfgang F.E.'s book "Post-Occupancy Evaluation" systematically reviewed POE methods, marking a peak in POE theoretical and methodological development, which had a significant impact on China [39]. George Baird proposed a POE method based on user involvement in design [40]. Aksah conducted functional performance evaluations after the renovation of historical government buildings, emphasizing the importance of comfort, safety, and service [41]. In summary, POE serves as a user-centric evaluation method for built environments, emphasizing evaluation after use, with the realization of value being its ultimate goal.

With the increasing sophistication of the POE theoretical system and technological advancements, POE has begun to utilize computers for assisted evaluation, integrating technologies such as the geographic information system (GIS), spatial syntax, and big data into the analysis process [42]. POE can use quantitative indicators to intuitively reflect the actual usage and users' opinions and needs of historical streets and alleys, thereby guiding future work. Choi et al. analyzed the post-design evaluation of Gwangbok Street to examine untested improvements in alley environments [43]. Koo et al. conducted a post-evaluation of the "Geumgang Stone Redrawing Street", focusing on its image and satisfaction, using a factor analysis and multiple regression analysis for image preference and satisfaction evaluation [44]. Maisel et al. used POE to evaluate the Complete Street (CS) project, conducting separate but similar surveys before and after construction. Statistical software R v.3.5.3 was used for all formal statistical analyses, concluding that participants in the post-construction survey were more satisfied with the main street corridor [45].

Through a literature review, it is evident that many scholars base their post-occupancy evaluations of historical streets and alleys on user perspectives, often linked to satisfaction assessment. This approach is not only evident in the study of historical streets but also in urban parks, outdoor spaces in healthcare institutions, rehabilitation gardens, and others [46–49]. Incorporating user satisfaction-oriented post-occupancy evaluation methods into the validation of phased objectives will help reduce social conflicts and promote collaborative protection practices involving multiple stakeholders.

2.3. Tourist Satisfaction Evaluation of Historical Neighborhood Alleys

Tourist satisfaction, derived from customer satisfaction, is the application and extension of customer satisfaction theory in the tourism field. Cardozo (1964), an American scholar, introduced customer satisfaction into the realm of commerce. Building upon this, Pizam (1978) proposed the concept of "tourist satisfaction", defining it as the difference

between tourists' pre-trip expectations and post-trip perceptions [50]. As an assessment tool for evaluating tourist experiences, tourist satisfaction significantly influences destination decisions, the consumption of products and services, and intentions for repeat visits [51,52]. Therefore, the evaluation of tourist satisfaction is crucial for the success and survival of historical streets [53].

Since Pizam introduced the concept of tourist satisfaction, many scholars at home and abroad have further interpreted its meaning. Oliver first proposed the Expectation-Confirmation Theory; Beard J. G. et al. viewed tourist satisfaction as a positive, subjective experience and psychological feeling formed by comparing tourists' pre-trip expectations with on-site experiences [54]; Chon, Kye-Sung, based on the relationship between tourists and tourist destinations, considered tourist satisfaction to be the degree of consistency between tourists' expectations of a destination and their perceptions after experiencing it [50]; Del Bosque et al. defined tourist satisfaction as a state of personal cognition and emotion triggered by tourist experiences [55]. Mutanga et al. found that the gap between tourists' expectations before traveling and their actual experiences during travel significantly affects tourist satisfaction [56]; Suhartanto et al. explicitly stated that tourists' loyalty to visited attractions is closely related to their tourism motivations [57]. In summary, there are numerous factors influencing tourist satisfaction, and these factors vary with changes in tourist destinations.

The evaluation of tourist satisfaction in historical alleys mainly focuses on two aspects: influencing factors and satisfaction assessment. Regarding the influencing factors of tourist satisfaction, Han et al. analyzed the impact of noise on tourist satisfaction using Beijing's Nanluoguxiang as an example [58]; Barrera-Fernández et al. suggested that pedestrian suitability in Oaxaca, Mexico, plays a crucial role in tourist satisfaction and experience, focusing on individual and external factors influencing walking willingness, such as safety, cleanliness, traffic congestion, and pollution [59]. Ko et al. proposed a quantitative and planning method for the optimal tour route of historical alleys in Taiwan based on algebraic matrix technology, which can enhance tourist satisfaction by reducing visitation time, providing route diversity, and increasing tourism satisfaction [60]. In terms of tourist satisfaction assessments, quantitative methods are often used, employing mathematical models, such as an IPA analysis, a revised IPA analysis, a linear regression, structural equation modeling, and the analytic hierarchy process. Chang et al. used a linear regression analysis to analyze the impact of services provided by tour guides on tourist satisfaction in scenic areas [61]. Seonghyeon Kim et al. analyzed the traditional market characteristics that affect user satisfaction and sustainability using structural equation modeling, focusing on revitalizing traditional alleys in Seoul [62]. Park et al. used a confirmatory factor analysis and structural equation modeling to examine the causal relationships among the nostalgia, authenticity, satisfaction, and revisit intention of tourists visiting the Chicken East Mural Alley in Suwon, South Korea. They emphasized the importance of tourist satisfaction [63].

Tourist satisfaction, as an important criterion for measuring the quality of historical alley transformations, deeply explores influencing factors and enhances satisfaction, which is of great significance for improving the tourism competitiveness of historical alleys.

3. Materials and Methods

3.1. Research Object

This paper selected Jinyu Alley in Quanzhou as the research site. Quanzhou is the first capital of East Asian culture in China, one of the important starting points of the Maritime Silk Road, and one of the first batches of historical and cultural cities announced by China (see Figure 1). During the Spring Festival period in 2024, Quanzhou City achieved a cumulative total tourism revenue exceeding 100 billion yuan, reaching 13.845 billion US dollars, ranking first in both tourist reception growth rate and tourism revenue growth rate in Fujian Province. Jinyu Alley is a famous tourist street in Quanzhou, a first-level protected alley in the ancient city, with the Huang Clan Ancestral Hall being a municipal-level protected cultural relic and the former residence of Li Gongcang being a registered

immovable cultural relic. Jinyu Alley was built from the Tang Dynasty Quanzhou City and expanded on its basis in subsequent dynasties, forming a four-fold structure of Tang City—Zi City—Luo City—Yi City (see Figure 2).

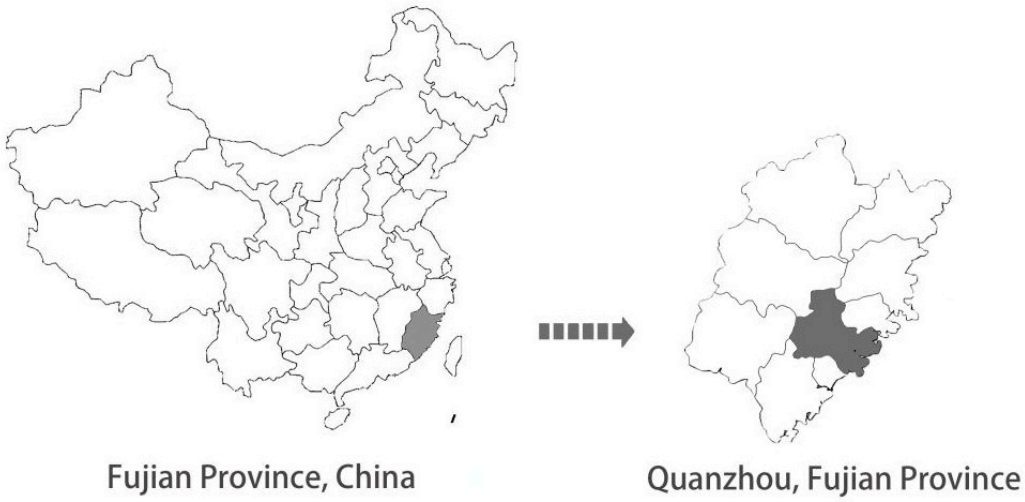


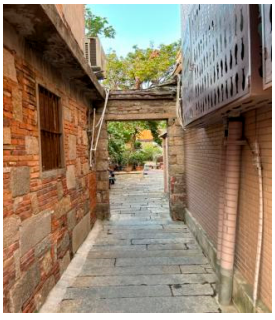
Figure 1. The geographical location of Quanzhou in China. (Source: Self-drawn by the author).

Figure 2. The geographical location of Jinyu Alley in Quanzhou Ancient City. (Source: Self-drawn by the author).

In 2017, Jinyu Alley underwent street and alley renovation with the concept of "micro-renovation": a large amount of old bricks and old slate were used to repair old buildings and ground; traditional craftsmanship was used to repair some traditional rammed earth walls and brick-and-stone walls; some walls were restored to the appearance of sea oyster shell-washed stones; deformed machine covers, exposed electrical boxes, irregular manhole covers, and others were all incorporated into the Jinyu fish totem for external renovation; superior old fir was used to carve exquisite floral lattice windows; and so on (see Table 2). Jinyu Alley condenses more than ten traditional Minnan architectural traditional crafts, preserving multiple architectural elements, environmental elements, and spatial elements from the Tang and Song dynasties to the 20th century, even protecting the green banyan trees entwined with broken walls. The "Jinyu Alley Micro-Renovation Project" won the

first prize in the special category of historical and cultural protection and innovation in the "2019–2020 Architectural Design Awards" of the Architectural Society of China, and in 2022, Jinyu Alley was rated as a comprehensive demonstration project for street blocks. The Historical and Cultural Protection and Inheritance Professional Committee and the review experts of the Ministry of Housing and Urban–Rural Development believe that the micro-renovation project of Jinyu Alley has reference significance in five aspects: overall protection demonstration, the improvement of living environment demonstration, activation and utilization demonstration, innovative technical methods, and public participation management, and it has a comprehensive demonstration role in protection and inheritance.

Table 2. Specific manifestations of "micro-renovation" in Jinyu Alley. (Source: self-drawn by the author).

Reconstruction Direction	Concrete Performance	Reconstruction Direction	Concrete Performance
Building restoration		Ground restoration	
Wall restoration		The maritime shell-washed stone style	
Stone incorporation		Facade rectification	
Gold fish patterned totems		Delicate Lattice windows	

3.2. Research Methodology

3.2.1. Factor Analysis Method

Factor analysis originated in the early 20th century as a method proposed by K. Pearson, C. Spearman, and other scholars for defining and measuring intelligence. It is a statistical method used in multivariate analysis to reduce dimensionality [64]. The primary objective of factor analysis is to attempt to describe a set of observable, interrelated variables with the fewest number of unobservable, mutually uncorrelated factors while reasonably explaining the correlations among the original variables [65].

Factor analysis simplifies and reduces the original data, aiming to represent the fundamental structure of numerous random variables using a few comprehensive variables. It is formally represented as follows:

$$\begin{cases} x_1 = a_{11}F_1 + +a_{12}F_2 + \ldots + a_{1m}F_m + \varepsilon_1 \\ x_2 = a_{12}F_1 + +a_{22}F_2 + \ldots + a_{2m}F_m + \varepsilon_2 \\ \quad\quad\quad . \\ \quad\quad\quad . \\ \quad\quad\quad . \\ x_p = a_{p1}F_1 + +a_{p2}F_2 + \ldots + a_{pm}F_m + \varepsilon_m \end{cases}$$

expressed in terms of a matrix:

$$\begin{bmatrix} x_1 \\ x_2 \\ . \\ . \\ . \\ x_p \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} & \ldots & a_{1m} \\ a_{21} & a_{22} & \ldots & a_{2m} \\ & & . & \\ & & . & \\ & & . & \\ a_{p1} & a_{p2} & \ldots & a_{pm} \end{bmatrix} \begin{bmatrix} F_1 \\ F_2 \\ . \\ . \\ . \\ F_m \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ . \\ . \\ . \\ \varepsilon_m \end{bmatrix}$$

where $x_1, x_2, \ldots, x_p$ are the p original variables, a_{ij} denotes the loading coefficient of the ith variable on the jth factor, $F_1, F_2, \ldots, F_m (m < p)$ are the factor variables, and $\varepsilon_i (i = 1, 2, \ldots, m, m < p)$ are special factors.

$$X = AF + \varepsilon$$

where $F_1, F_2, \ldots, F_m$ are unobservable variables called common factors and their coefficients are called factor loadings. ε_i are special factors, which are parts that cannot be represented by the first m common factors, and it satisfies the following:

$$\text{cov}(F, \varepsilon) = 0 \quad (1)$$

The common factors are not correlated with the special factors.

$$D_f = D(F) = \begin{bmatrix} 1 & & & 0 \\ & 1 & & \\ & & \ddots & \\ 0 & & & 1 \end{bmatrix} = I_m \quad (2)$$

The common factors have variance 1 and are uncorrelated with each other.

$$D_\varepsilon = D(\varepsilon) = \begin{bmatrix} {\sigma_1}^2 & & & 0 \\ & {\sigma_2}^2 & & \\ & & \ddots & \\ 0 & & & {\sigma_p}^2 \end{bmatrix} \quad (3)$$

The individual special factors are uncorrelated, and the variances are not required to be equal in $\varepsilon_i \sim N(0, {\sigma_i}^2)$.

In the factor analytic model, F_1, F_2, …, F_m are called common factors, which are unobservable and mutually independent theoretical variables that appear in the expression for each of the original observed variables. Their meaning is determined by the practical significance contained in the specific problem under study. ε_1, ε_2, …, ε_m are called special factors and are factors specific to the components of the vector $X = (x_1, x_2, \ldots, x_p)^T$ are factors specific to the vector X_i (i = 1, 2, …, p). The special factors ε_1, ε_2, …, ε_m are independent of each other, and they are also independent of all common factors F_1, F_2, …, F_m.

3.2.2. Modified IPA Analysis Methodology

The traditional IPA (importance–performance analysis) method is commonly used to differentiate between stakeholders' perceptions of the importance of specific issues and their actual views on the management of these issues [66]. Despite its widespread use, many scholars have pointed out certain flaws in the traditional IPA analysis method. It solely measures and compares the significance of various evaluation indicators for enhancing customer satisfaction based on tourists' self-reported satisfaction and importance ratings without allowing for independence between satisfaction and importance [67].

In comparison to the traditional approach, the improved IPA method effectively eliminates potential subjective influences in individual satisfaction assessments and alleviates respondents' burden [68]. To eliminate the correlation between self-reported importance and satisfaction factors, most scholars suggest replacing self-reported importance with implicitly derived importance. Deng Weizhao proposed calculating the partial correlation coefficient between individual satisfaction and overall satisfaction as the score of implicitly derived importance, as the partial correlation coefficient can more accurately reflect the true importance assessment. In this paper, we used Deng Weizhao's correction method to transform and analyze the data:

1. Find the natural logarithm In(Si) of tourists' satisfaction (Si) with respect to each evaluation index so that it is linearly distributed;
2. Take In(Si) as the independent variable and the mean value of tourists' satisfaction (OS) as the dependent variable to conduct a regression analysis to compute the partial correlation coefficient between In(Si) and OS, i.e., the implied significance score.

The partial correlation coefficient can be calculated with iterative method (recursivemethod) or matrixinversion in SPSS 22.0 software.

3.3. Semi-Structured Interviews

Semi-structured interviews are a common data collection method that enhance the objectivity and credibility of research [69]. The author conducted semi-structured interviews from the perspectives of both tourists and residents (see Tables 3 and 4) to lay the groundwork for establishing subsequent evaluation criteria.

Table 3. Presentation of the interview content with local residents of Jinyu Alley in Quanzhou. (Source: self-drawn by the author).

Interview Scope	Involved Factor	Positive Emotion	Negative Emotion
Comfort	Traffic location	4	8
	Public facilities	10	2
	Community management	9	3
Privacy	Private need	4	8
Attribution	Sense of belonging	10	2
Resident benefit	Economic income	10	2
	Living standard	9	3
	Convenient life	10	2

Table 4. Depiction of the interview content with tourists visiting Jinyu Alley in Quanzhou. (Source: self-drawn by the author).

Interview Scope	Involved Factor	Positive Emotion	Negative Emotion
Characteristic	Architectural feature	42	7
	Folk culture	39	10
	Nongenetic inheritance	40	9
	Street greening	25	24
	Commercial form	26	23
Interactivity	Experience intangible cultural heritage	32	17
	Watch cultural events	37	12
Convenience	Transportation accessibility	24	25
	Infrastructure	40	9

Questionnaire

Through on-site interviews with 12 local residents and 49 tourists, a comparative analysis was conducted to understand the differing focuses of the two user groups regarding the renovation of Jinyu Alley. The interview data revealed significant disparities in the categories of concern and the experiential perceptions between the two user types. Local residents showed more interest in the benefits and convenience brought by the renovation of the alleyway, while tourists prioritized the convenience of service facilities, the aesthetic appeal of the landscape and architecture, and a higher demand for historical and cultural significance.

During the field research, the author learned from interviews with residents that prior to the renovation of Jinyu Alley, the narrowness of the roads and the excessive density of buildings, coupled with insufficient consideration of water, electricity, and internet needs, resulted in an unfavorable living environment for some ancient dwellings and grand residences within the alley. Increasingly, young people are reluctant to reside in the old city. The original residents have dwindled significantly, currently numbering less than 15 households. Jinyu Alley has transformed into a commercial street catering to tourists. Considering the authenticity and effectiveness of the questionnaire, this study was unable to establish evaluation criteria at the resident level or conduct questionnaire surveys targeting residents.

3.4. Evaluation Criteria Establishment

In the "Evaluation Index System for Chinese Historical and Cultural Towns (Villages)", Jinyu Alley meets the criteria for a complete and continuously landscaped historical alley, indicating that historical alleys are primarily evaluated for their preservation integrity and landscape continuity in historical towns (villages). Furthermore, based on Maslow's hierarchy of needs, tourists' needs are analyzed from low to high as "physiological needs", "safety needs", "social needs", "esteem needs", and "self-actualization needs": "physiological needs" and "safety needs" should firstly address issues related to living environment, safety, and relevant supporting facilities and services; "social needs" address the "commercial and economic environment" section; "esteem needs" and "self-actualization needs" address the inheritance of intangible cultural heritage and alley management; among others. Combining the semi-structured interviews with tourists mentioned earlier, this study designed an evaluation system consisting of 27 evaluation criteria covering historical district environment, architecture, and management aspects. Finally, using the Delphi method, 10 experts, such as design planners and urban and rural planning professors, were consulted to discuss, score, and judge, resulting in the deletion or modification of four unreasonable factors, ultimately yielding 23 evaluation criteria. These criteria were

further detailed and assessed using the semantic differential (SD) method [70]. For detailed indicators, refer to Table 5.

Table 5. Description table of SD factor adjective pairs. (Source: self-drawn by the author).

Serial Number	Evaluation Indicators	Description of SD Evaluation Indicators
1	Architectural style	Architectural unity-Architectural chaos
2	Architectural preservation	Buildings in good condition - Buildings in poor condition
3	Neighborhood transportation connections and transitions	Neighborhood transportation connections and transitions that make sense-Neighborhood transportation connections and transitions that do not make sense
4	Neighborhood spatial form and scale	Neighborhoods with good spatial form and scale-Neighborhoods with less spatial form and scale
5	Landscaping	Landscape with rich greenery - Landscape with single greenery
6	Environmental vignettes	Environmental vignettes special - Environmental vignettes ordinary
7	Public health location	Conveniently located public health - Distantly located public health
8	Parking location	Convenient parking location - Distant parking location
9	Leisure facility	Leisure-rich-Leisure-unique
10	Trash can facilities	Low density of dumpster facilities - High density of dumpster facilities
11	Personnel flow	High flow of personnel- Low flow of personnel
12	Business Features	Commercial features with strong appeal - Commercial features with weak appeal
13	Quality of food and beverage	Catering quality attractive strong-Catering quality attractive weak
14	Type of business	Variety of business-Single type
15	Traditional festivals	Traditional festivals with good atmosphere - Traditional festivals with weak atmosphere
16	Non-genetic inheritance	Those who attach importance to non-genetic inheritance - Those who do not attach importance to non-genetic inheritance
17	Cultural activity	Culturally enriched-Culturally unenriched
18	Preservation of historical sites	Historic sites well preserved-Historic sites not preserved
19	Preservation of architectural texture	Well-preserved architectural texture - Missing architectural texture
20	Preservation of folk culture	Folklore culture emphasized - Folklore culture not emphasized
21	Street environment	Clean street environment - Dirty street environment
22	Maintenance of facilities	Timely maintenance of facilities - Delayed maintenance of facilities
23	Public security management	Well policed- Poorly policed

3.5. Question

A total of 500 questionnaires were distributed one on one, and after excluding invalid responses, 410 were collected, resulting in an effective response rate of 82%. The demographic section of the questionnaire focused on tourists' social attributes and visitation methods, including gender, age group, educational level, mode of transportation, and frequency of visits. The evaluation criteria section comprised the 23 evaluation criteria listed in Table 5. Each question in the survey was converted into scores to facilitate the assessment of environmental quality. Responses were categorized into five levels: Very Satisfied = 5, Quite Satisfied = 4, Neutral = 3, Dissatisfied = 2, Very Dissatisfied = 1 (see Appendices A and B).

4. Results

4.1. Data Result Analysis

The distribution of questionnaires was scheduled during holidays and weekends from 1 April 2023 to 20 June 2023. The analysis of the collected valid questionnaires revealed that among the tourist population, females constituted a significant proportion, accounting for 62.44% of the total; the majority were below the age of 35, comprising 82.42% of the total; regarding educational background, individuals with at least a college degree accounted for a high proportion, reaching 74.76%, indicating a generally high level of education among tourists. In terms of transportation methods and visit frequency, the most common choices were high-speed rail travel and first-time visitors, accounting for 26.43% and 26.34% of the total, respectively. In terms of travel purposes, the majority of visitors to Jinyu Alley were generally tourists, leisure walkers, and those seeking dining experiences.

4.2. Evaluation Criteria System Analysis

To assess the suitability of the data for the factor analysis, statistical tests, such as Kaiser–Meyer–Olkin (KMO) and Bartlett's sphericity tests [71], were conducted.

The KMO test measures the comparability of simple and partial correlations between variables. A higher KMO value indicates stronger correlations between variables, with values exceeding 0.7 considered suitable for a factor analysis and those below 0.5 indicating unsuitability. The formula for calculating KMO is as follows:

$$\mathrm{KMO} = \frac{\sum\sum_{i \neq j} {r_{ij}}^2}{\sum\sum_{i \neq j} {r_{ij}}^2 + \sum\sum_{i \neq j} {p_{ij}}^2} \tag{4}$$

From Table 6, it can be observed that the KMO test result of this study is 0.912, and the Sig (*p*-value) of Bartlett's sphericity test is less than 0.001, indicating strong correlations and good construct validity. Cronbach's alpha coefficient is used to measure the reliability of the questionnaire [72], with the calculation formula as follows:

$$a = \frac{K}{K-1}\left(1 - \frac{\sum S_i^2}{S_x^2}\right) \tag{5}$$

Table 6. Validity analysis.

KMO Measurement Sampling Adequacy		0.912
Bartlett's spherical test	Chi-square last read	2281.570
	Degrees of freedom	253
	Significance	0

From Table 7, it is evident that the Cronbach's alpha coefficient is 0.935, which is greater than 0.7, indicating that the survey questionnaire has high reliability.

Table 7. Reliability analysis.

Cronbach's Alpha	Number of Terms
0.935	23

4.3. Evaluation Criteria System Naming

A factor analysis was employed to extract five common factors with eigenvalues greater than 1 (refer to Table 8). These factors accounted for a cumulative variance of 63.44% (>60%), indicating that the overall explanatory power of the scale is sufficient to represent the information obtained from the 23 items in the questionnaire.

Table 8. Total Variance Explained Table.

Elements	Initial Eigenvalue			Extracted Sum of Squared Loads			Rotating Load Sum of Squares		
	Total	Variance Contribution Rate (%)	Grand Total (%)	Total	Variance Contribution Rate (%)	Grand Total (%)	Total	Variance Contribution Rate (%)	Grand Total (%)
1	9.037	39.292	39.292	9.037	39.292	39.292	4.006	17.416	17.416
2	1.785	7.761	47.053	1.785	7.761	47.053	2.841	12.353	29.769
3	1.502	6.529	53.582	1.502	6.529	53.582	2.782	12.095	41.864
4	1.224	5.321	58.904	1.224	5.321	58.904	2.502	10.877	52.741
5	1.045	4.545	63.449	1.045	4.545	63.449	2.463	10.708	63.449

Note: The extraction method used was principal component analysis.

Additionally, the factor loading matrix is a component of the factor analysis results. The factor loading matrix groups the initial evaluation factors most closely related to the five common factors. Each principal component represents several aspects of the Jinyu Alley renovation, and appropriate principal component names can be selected based on the aspects they represent (see Table 9).

Table 9. Rotated Factor Loading Matrix.

Evaluation Indicators	Factor				
	1	2	3	4	5
Non-genetic inheritance	0.769	-	-	-	-
Cultural activity	0.754	-	-	-	-
Traditional festivals	0.743	-	-	-	-
Preservation of folk culture	0.658	-	-	-	-
Preservation of historical sites	0.639	-	-	-	-
Preservation of architectural texture	0.617	-	-	-	-
Parking location		0.748	-	-	-
Trash can facilities		0.718	-	-	-
Leisure facility		0.688	-	-	-
Landscaping		0.598	-	-	-
Environmental vignettes		0.561	-	-	-
Maintenance of facilities			0.773		-
Street environment			0.764	-	-
Public security management			0.757	-	-
Public health location			0.572	-	-
Personnel flow				0.760	-
Business features				0.684	-
Type of business				0.658	-
Quality of food and beverage				0.606	-
Neighborhood transportation connections and transitions					0.735
Neighborhood spatial form and scale					0.716
Architectural preservation					0.630
Architectural style					0.603

Principal Component 1, which is closely related to 6 initial evaluation indicators, including intangible cultural heritage preservation, cultural activities, traditional festivals, folk culture preservation, historical relic preservation, and architectural texture preservation, describes the historical culture of Jinyu Alley. Therefore, it is named "Historical Context".

Principal Component 2 mainly describes the supporting attributes of Jinyu Alley's neighborhood and the demand for recreational facilities, including parking spaces, density of trash bins, recreational facilities, landscape greening, and environmental ornaments. Therefore, it is named "Supporting Facilities".

Principal Component 3 primarily describes the management and rationality of Jinyu Alley's streets, including facility maintenance, street environment, security management, and public restroom locations. Therefore, it is named "Operational Management".

Principal Component 4 mainly describes tourists' commercial demands and performances in Jinyu Alley, including visitor flow, types of businesses, commercial features, and dining quality. Therefore, it is named "Commercial Environment".

Principal Component 5 mainly describes the neighborhood and spatial performances of Jinyu Alley, including street traffic connections and transformations, street traffic forms and scales, architectural preservation, and architectural styles. Therefore, it is named "Neighborhood Space".

4.4. Analysis of Tourist Satisfaction

4.4.1. Satisfaction Analysis of Tourists Regarding the Preservation and Reuse of Historical Alleyways

1. Historical Context Aspect. From Table 10, it is evident that among the 23 evaluation criteria, the highest score is obtained for intangible cultural heritage preservation, reaching 4.13. The satisfaction levels for folk culture preservation, architectural texture preservation, and historical relic preservation are close, at 4.11, 4.11, and 4.1, respectively. Traditional festivals and cultural activities score 4.04 and 3.90, respectively.
2. Operational Management Aspect. Tourists' evaluations of operational management are relatively high as well, with street environment (4.17), security management (4.08), facility maintenance (3.95), and public restroom locations (3.88) all indicating that Jinyu Alley's management of renovated historical streets is fairly comprehensive.
3. Neighborhood Space Aspect. In terms of neighborhood space, tourists express relatively high satisfaction with architectural style (4.1) and architectural preservation (4.05). Satisfaction levels are slightly lower for traffic connections and transformations (3.8) and traffic forms and scales (3.8).
4. Commercial Environment Aspect. In the commercial environment aspect, visitor traffic (3.8), commercial features (3.9), and dining quality (3.8) are all above average, with similar scores. Only the diversity of businesses (3.6) falls below the average.
5. Supporting Facilities Aspect. Among the five principal components, the satisfaction with supporting facilities is less optimistic. Landscape greening (3.77) and environmental ornaments (3.72) have similar scores, with slight differences. Satisfaction levels are lower for recreational facilities (3.58) and trash bin facilities (3.49), while parking space satisfaction (3.16) is the lowest, indicating significant room for improvement in supporting facilities.

In summary, Principal Component 1 "Historical Context" has the highest average score of 4.65, while Principal Component 2 "Supporting Facilities" has the lowest average score of 3.54. Principal Component 3 "Operational Management", Principal Component 4 "Commercial Environment", and Principal Component 5 "Neighborhood Space" have average scores of 4.02, 3.79, and 3.91, respectively. Subsequently, specific indicators needing updates and their priority order will be proposed based on the revised importance–performance analysis (IPA) method.

Table 10. Tourist satisfaction.

Serial Number	Evaluation Indicators	Satisfaction
1	Architectural style	4.10
2	Architectural preservation	4.05
3	Neighborhood transportation connections and transitions	3.80
4	Neighborhood spatial form and scale	3.80
5	Landscaping	3.77
6	Environmental vignettes	3.72
7	Public health location	3.88
8	Parking location	3.16
9	Leisure facility	3.58
10	Trash can facilities	3.49
11	Personnel flow	3.87
12	Business features	3.90
13	Quality of food and beverage	3.80
14	Type of business	3.60
15	Traditional festivals	4.04
16	Non-genetic inheritance	4.13
17	Cultural activity	3.90
18	Preservation of historical sites	4.10
19	Preservation of architectural texture	4.11
20	Preservation of folk culture	4.11
21	Street environment	4.17
22	Maintenance of facilities	3.95
23	Public security management	4.08

4.4.2. Modified Importance–Performance Analysis (IPA) Analysis

Utilizing the modified importance–performance analysis (IPA) method, the natural pairing of tourists' satisfaction scores for each evaluation criterion in the questionnaire is taken as the independent variable, while the mean overall satisfaction is considered the dependent variable. A multiple regression analysis is conducted to obtain the partial correlation coefficient between the two, which represents derived importance.

The derived importance data for each tourist evaluation criterion ranges from 0.2 to 0.7, replacing the original self-reported importance data of tourists for the revised IPA analysis (see Table 11). In the revised IPA analysis, with the average satisfaction score of indicators as the vertical axis and the derived importance as the horizontal axis, the overall mean satisfaction and derived importance (3.87, 0.43) serve as the coordinate origin. The intersection of the means of the two measures forms the zero point, dividing the graph into four quadrants. A satisfaction-derived importance quadrant graph is generated using SPSS 22.0 software, with the 23 criteria distributed across different quadrants of the Cartesian coordinate system. The specific distribution of criteria is illustrated in Figure 3.

Table 11. Derived Importance.

Serial Number	Evaluation Indicators	NO.	Satisfaction	Elicited Importance
1	Architectural style	1	4.10	0.285
2	Architectural preservation	2	4.05	0.432
3	Neighborhood transportation connections and transitions	3	3.80	0.478
4	Neighborhood spatial form and scale	4	3.80	0.439
5	Landscaping	5	3.77	0.500
6	Environmental vignettes	6	3.72	0.534

Table 11. *Cont.*

Serial Number	Evaluation Indicators	NO.	Satisfaction	Elicited Importance
7	Public health location	7	3.88	0.554
8	Parking location	8	3.16	0.442
9	Leisure facility	9	3.58	0.279
10	Trash can facilities	10	3.49	0.477
11	Personnel flow	11	3.87	0.470
12	Business features	12	3.90	0.498
13	Quality of food and beverage	13	3.80	0.482
14	Type of business	14	3.60	0.530
15	Traditional festivals	15	4.04	0.448
16	Non-genetic inheritance	16	4.13	0.305
17	Cultural activity	17	3.90	0.506
18	Preservation of historical sites	18	4.10	0.362
19	Preservation of architectural texture	19	4.11	0.357
20	Preservation of folk culture	20	4.11	0.375
21	Street environment	21	4.17	0.408
22	Maintenance of facilities	22	3.95	0.417
23	Public security management	23	4.08	0.389

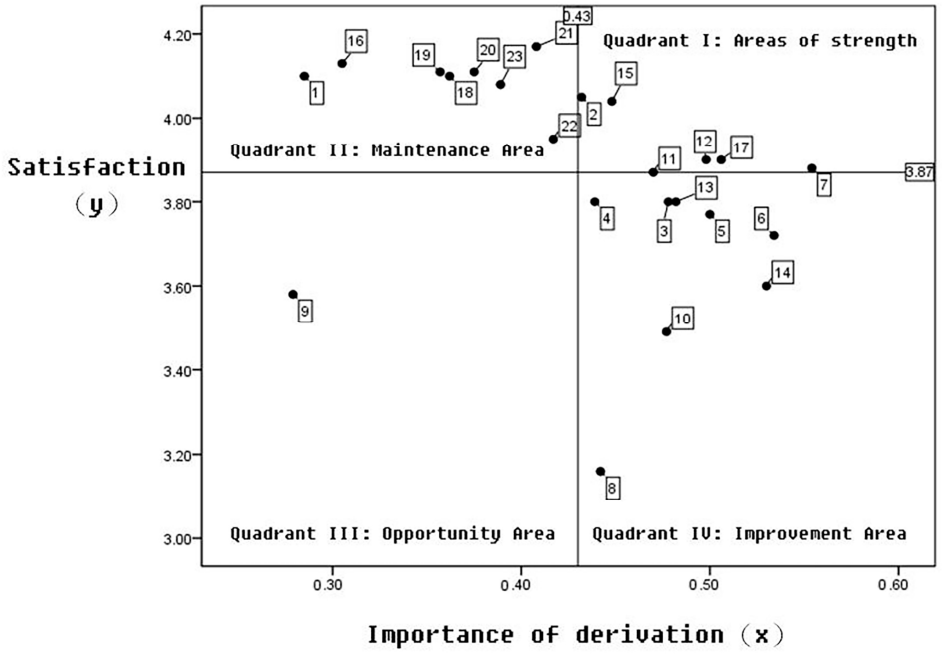


Figure 3. Modified IPA quadrant map. (Source: Self-drawn by the author).

The first quadrant, termed the "Dominant Zone", encompasses evaluation criteria with high derived importance and satisfaction ratings. There are six indicators falling within this zone: Indicator 2 (Architectural preservation), Indicator 15 (Traditional festivals), Indicator 11 (personnel flow), Indicator 12 (business features), Indicator 17 (cultural activities), and Indicator 7 (public health location).

The second quadrant, labeled the "Maintenance Zone", comprises evaluation criteria with relatively low derived importance but high satisfaction ratings. Eight indicators fall within this zone: Indicator 1 (architectural style), Indicator 16 (non-genetic inheritance), Indicator 18 (preservation of historical sites), Indicator 19 (preservation of architectural texture), Indicator 20 (preservation of folk culture), Indicator 21 (street environment), Indicator 22 (maintenance of facilities), and Indicator 23 (public security management).

The third quadrant, termed the "Opportunity Zone", consists of evaluation criteria with both low derived importance and satisfaction ratings. Although the importance of these indicators is relatively low, it does not imply insignificance; rather, it may indicate an oversight in these areas. Relevant departments should pay attention to these indicators to enhance their performance. Only one indicator falls within this zone: Indicator 9 (leisure facility).

The fourth quadrant, labeled the "Improvement Zone", encompasses evaluation criteria with low satisfaction ratings but high derived importance. These indicators are critical for improving tourist satisfaction, and relevant departments should prioritize efforts to enhance and improve in these areas. Eight indicators fall within this zone: Indicator 3 (neighborhood transportation connections and transitions), Indicator 4 (neighborhood spatial form and scale), Indicator 5 (landscaping), Indicator 6 (environmental vignettes), Indicator 8 (parking location), Indicator 10 (trash can facilities density), Indicator 13 (quality of food and beverage), and Indicator 14 (type of business), with Indicator 8 (parking location) having the lowest satisfaction among tourists.

5. Discussion

In terms of the "Historical Context" aspect, two evaluation criteria fall within the first quadrant, and four fall within the second quadrant, indicating a commendable transformation of Jinyu Alley concerning its historical context. Local architectural features play a vital role in attracting tourists. In addition, cultural activities and traditional festivals receive full recognition from visitors. Moreover, the pervasive presence of Xunpu women's hairpin imagery and intangible cultural heritage (such as lantern making, puppetry performances, Nanyin performances, brick painting experiences, etc.), hidden in every nook and cranny, offers highly immersive experiences, attracting visitors through dynamic heritage preservation. Additionally, promoting awareness among visitors regarding historical residences and events through exhibitions and live events, planning live performances to enhance visitor engagement, prolonging stay durations, and enriching tourist experiences also provide highly immersive experiences. For the future preservation and reuse of historical alleyways, it is essential to maintain indicators falling within the dominant zone and continually explore ways to provide visitors with a better experiential journey rooted in traditional culture.

Evaluation criteria for "Operational Management" primarily fall within the second quadrant, with "Public Health Location" in the first quadrant. This indicates relatively a sound management of the transformed historical alleyways, with tourists rating operational management relatively high. Moreover, local residents express affirmation regarding their improved living standards and convenience post-alley transformation. Operational management, as the logistical support of alleyways, significantly influences both the tourist experience and residents' living conditions. In subsequent improvements of historical alleyways, relevant departments should emphasize concealed services for tourists, ensure proper equipment operation, maintain the cleanliness of the alley environment, control pedestrian flow within manageable limits to prevent congestion, and continually uphold a positive tourist perception of the area.

For the "Neighborhood Spatial" aspect, "Architectural Preservation" and "Architectural Style" fall within the first and second quadrants, respectively, whereas "Neighborhood Transportation Connections and Transitions" and "Neighborhood Spatial Form and Scale" fall within the fourth quadrant, indicating relatively poor performance. Although obstacles in alleys have been cleared during the transformation process without altering their original width, Jinyu Alley, located in the central area of the ancient city, faces severe land constraints. Furthermore, the conversion of the Zhongshan Middle Road section into a pedestrian walkway exacerbates the shortage of parking spaces for motor vehicles. Consequently, inconvenient transportation connections within the alleys affect both resident and visitor satisfaction. In future renovations, improving traffic management systems to enhance pedestrian environmental quality and alleviate alley traffic congestion is crucial.

Concerning the "Commercial Environment", "Personnel Flow" and "Business Features" fall within the first quadrant, while "Quality of Food and Beverage" and "Type of Business" fall within the fourth quadrant. On-site research reveals that Jinyu Alley mainly consists of catering and cultural industries. Following micro-updates, the Quanzhou government vigorously supports the introduction of cultural industries into Jinyu Alley. However, the response from the public and survey data indicate a relatively average reception, with substantial deficiencies in the completeness of the commercial street. Therefore, it is suggested that the preservation and reuse of historical alleyways emphasize not only preservation but also leverage this foundation to promote comprehensive investment, create a commercial street rooted in local culture, and establish its brand and theme, distinguishing it from other historical alleyways.

Within the "Supporting Facilities" aspect, only the "Leisure Facility" criterion falls within the third quadrant, while other evaluation criteria fall within the fourth quadrant, indicating that indicators in supporting facilities are key areas for improvement. Due to the narrow shape of the alleys, parking spaces for electric vehicles are limited. Following micro-updates, the front section of Jinyu Alley is mostly inaccessible to electric vehicles during most time periods, causing frequent blockages at the alley entrance, inconveniencing residents' travel, and preventing tourists from enjoying a normal visit. Therefore, emphasizing reasonable planning of parking locations during the preservation and reuse of historical alleyways, catering to the needs of different demographic groups, and ensuring a good tourism experience and no disruption to residents' daily lives is crucial. Additionally, due to historical urban development and local demand, the lack of landscaping in Jinyu Alley results from increasing building density and shrinking idle spaces over time. Improving landscaping, environmental features, and recreational facilities to satisfy tourists' walking experiences and combining local folk culture to implement "micro-precision" designs through space reuse for repair, addition, and reproduction can address the shortcomings of the original alley layout, thereby perpetuating regional cultural heritage. Finally, placing an appropriate number of trash bins to maintain cleanliness, with sealed bins to prevent mosquitoes and flies; reducing foul odors; beautifying the environment; improving living conditions; and enhancing recreational environments are crucial and require prompt improvement.

The overall conditions of "Historical Context", "Operational Management", and "Commercial Environment" in Jinyu Alley are performing well, with a need for significant improvement in "Quality of Food and Beverage" and "Type of Business". Conversely, performance in "Supporting Facilities" and "Neighborhood Spatial" aspects, particularly regarding "Neighborhood Transportation Connections and Transitions" and "Neighborhood Spatial Form and Scale", is relatively poor, prompting relevant departments to take notice and gradually improve (refer to Table 12).

Table 12. Illustrates the distribution of tourist satisfaction ratings across different evaluation criteria into quadrants.

Primary Evaluation Indicators	Secondary Evaluation Indicators	NO.	Q1	Q2	Q3	Q4
Neighborhood Spatial	Architectural style	1		✔		
	Architectural preservation	2	✔			
	Neighborhood transportation connections and transitions	3				✔
	Neighborhood spatial form and scale	4				✔
Supporting facilities	Landscaping	5				✔
	Environmental vignettes	6				✔
	Parking location	8				✔
	Leisure facility	9			✔	
	Trash can facilities	10				✔

Table 12. *Cont.*

Primary Evaluation Indicators	Secondary Evaluation Indicators	NO.	Q1	Q2	Q3	Q4
Commercial environment	Personnel flow	11	✔			
	Business features	12	✔			
	Quality of food and beverage	13				✔
	Type of business	14				✔
Historical context	Traditional festivals	15	✔			
	Non-genetic inheritance	16		✔		
	Cultural activity	17	✔			
	Preservation of historical sites	18		✔		
	Preservation of architectural texture	19		✔		
	Preservation of folk culture	20		✔		
Operational management	Public health location	7	✔			
	Street environment	21		✔		
	Maintenance of facilities	22		✔		
	Public security management	23		✔		

Most of the five principal component analyses are discussed in terms of tourist satisfaction, but as an integral neighborhood alley space, residents are also stakeholders in Jinyu Alley. Therefore, incorporating residents' voices to provide a more comprehensive and diversified perspective on the impact of tourism on historical alleys helps formulate more inclusive and sustainable conservation strategies.

The majority of original residents positively evaluate the transformed Jinyu Alley, noting improvements in the street environment and the availability of related supporting facilities and services, stimulating thoughts among some older residents about continuous, long-term residency. Following the transformation, foot traffic in Jinyu Alley has surged, reaching an average of 35,000 visits per day during the Spring Festival period in 2024. Shop rents within the alley have also increased in line with the rise in foot traffic, enhancing residents' economic benefits and strengthening their sense of belonging to Jinyu Alley. However, due to this surge in popularity, residents, as providers and primary participants of public tourism resources, have not received sufficient privacy protection. Government departments should pay close attention to this in subsequent renovation processes. During micro-updates, residents often focus more on whether their own interests and needs are met and overlook the true meaning of ancient city preservation. Using the "restore as it was" approach for updates and repairs may not meet the practical needs of young residents, such as modern functionality and increased housing space, resulting in insufficient appeal to young residents. This issue is not unique to Jinyu Alley but also affects other historical alleyways, leading to a significant loss of original residents. Therefore, inevitable contradictions exist between "residents' actual needs" and "preservation of historical features". In subsequent renovation processes, the government should plan the commercial form within the neighborhood to avoid conflicts of interest between residents and businesses.

6. Conclusions

The preservation and reuse of historical areas is fundamentally a sustainable issue, requiring realistic conservation goals for the future. These goals must align with the practical development of the area while also considering the extent of heritage transmission [73].

This study contributes to the research direction of the preservation and reuse of historical alleyways by reviewing previous studies on their conservation and reuse, evaluating the post-use of historical alleyways, and exploring the theoretical literature on tourist satisfaction. Based on semi-structured interviews and incorporating Maslow's hierarchy of needs, evaluation criteria from the "Evaluation Index System of China's Historical and

Cultural Famous Towns (Villages)", and the Delphi method, a set of evaluation indicators for tourist satisfaction in the preservation and reuse of historical alleyways, are constructed. Sequentially, through the sustainable development (SD) method, factor analysis, and modified importance–performance analysis (IPA), tourist evaluations of the preservation and reuse of historical alleyways are obtained, and a tourist perspective analysis is conducted based on quantitative results. Additionally, incorporating residents' opinions helps correct deviations from conservation and reuse goals, providing a more comprehensive and diverse understanding of how different groups perceive historical alleyway space tourism. By employing different methods and perspectives, this study fills a social dimension gap in the academic research on the transformation of urban historical alleyway space, thereby promoting sustainable development from alleys to districts and then to ancient cities.

Furthermore, this study has the following limitations. First, due to the significant outmigration of indigenous residents and constraints on research conditions, there were variations in the sample sizes of stakeholders surveyed, which could introduce bias into the accuracy of the study results. Future research could address this issue to enhance the scientific validity of the conclusions. Second, regarding Table 5, the description of SD factor adjective pairs, combined with Likert scale scoring, reflects solely the subjective evaluation of visitors. Due to variations in criteria for judging quality across different regions, the precision of these assessments warrants further scrutiny. Third, there was no comparison between the traditional IPA analysis and modified IPA methods, indicating a need for greater depth in the study. Future endeavors could involve gathering sustainability information on historic streets and alleys through more diverse case samples. Additionally, given the susceptibility of human behavior to both objective environments and subjective emotions, further exploration into the methodological frameworks of environmental psychology and other behavioral sciences is warranted to broaden the scope of research and enhance the comprehensiveness and objectivity of the findings.

7. Recommendations

Considering the differing opinions and views held by tourists and original residents regarding the preservation and reuse of historical streets and lanes, the following aspects should be prioritized in the subsequent transformation process of historical street and lane spaces:

1. The government should enhance resident participation, establish a reasonable mechanism for benefit distribution, and further improve local residents' enthusiasm towards tourists.
2. Establish a regular communication and coordination mechanism among the government, scenic area managers, and residents to ensure the effective supply and standardized development of such resources.
3. Explore local cultural heritage and landmarks in depth, and develop a series of multi-faceted and multi-level display-oriented tourism products based on static resources.
4. Encourage the development of historical folklore activities and intangible cultural heritage experiences in the streets and lanes at scheduled times and locations to attract tourists.
5. Based on tourist satisfaction levels, it is evident that the supporting facilities are inadequate and the landscape greening is average. Therefore, it is recommended to develop rich plant landscapes appropriately to enhance the quality and visual appeal of the streets and lanes.
6. Based on the characteristics and historical–cultural value of historical streets and lanes, formulate different spatial utilization plans. Strengthen the promotion of this valuable cultural heritage through active publicity and the creation of a favorable atmosphere.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Survey on Tourist Evaluation of the Renovated Historic Streets and Alleys.

Evaluation Indicators	Strongly Agree (5 Points)	Agree (4 Points)	Neutral (3 Points)	Disagree (2 Points)	Strongly Disagree (1 Point)
Non-genetic inheritance					
Cultural activity					
Traditional festivals					
Preservation of folk culture					
Preservation of historical sites					
Preservation of architectural texture					
Parking location					
Trash can facilities					
Leisure facility					
Landscaping					
Environmental vignettes					
Maintenance of facilities					
Street environment					
Public security management					
Public health location					
Personnel flow					
Business features					
Type of business					
Quality of food and beverage					
Neighborhood transportation connections and transitions					
Neighborhood spatial form and scale					
Architectural preservation					
Architectural style					

Appendix B

Table A2. Visual map of the Jinyu Alley neighborhood.

Name	Neighborhood Landscape	Name	Neighborhood Landscape
Non-genetic inheritance		Cultural activity	
Traditional festivals		Preservation of folk culture	

Table A2. *Cont.*

Name	Neighborhood Landscape	Name	Neighborhood Landscape
Preservation ofhistorical sites		Preservation of architectural texture	
Parking location		Trash can facilities	
Leisure facility		Landscaping	
Environmental vignettes		Maintenance of facilities	
Street environment		Public security management	
Public health location		Personnel flow	
Type of business		Business features	

Table A2. *Cont.*

Name	Neighborhood Landscape	Name	Neighborhood Landscape
Quality of food and beverage		Neighborhood transportation connections and transitions	
Neighborhood spatial form and scale		Architectural preservation	
Architectural style			

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