



A Study on Improving the Lifestyle of Residents in Historic Urban Districts through Service Design: A Case Study of the Menxi Area

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Abstract

Background and Aim: This study examines the application of service design in enhancing the quality of life for residents in historic urban districts, with a focus on the Menxi area in Nanjing. As cities strive to modernize while preserving their cultural heritage, this research aims to address residents' needs through three key design interventions: urban greening, age-friendly furniture design, and the enhancement of spiritual and cultural life. **Materials and Methods:** A mixed method of quantitative and qualitative methods was employed, including surveys and stakeholder interviews, to identify the most pressing needs of residents. The study analyzed responses to determine appropriate design solutions that integrate sustainability, adaptability, and cultural preservation.

Results: The findings emphasize the necessity of integrating sustainable and adaptive design solutions. The proposed interventions include biodegradable seed paper for urban greening, aluminum-based modular furniture to enhance elderly residents' living conditions, and a cultural booklet to strengthen community identity. Further, incorporating smart infrastructure and fostering public-private partnerships can enhance implementation efficiency, ensuring long-term sustainability and broader applicability in urban renewal projects.

Conclusion: These solutions not only address the functional demands of modern living but also contribute to cultural heritage preservation and community engagement. This study provides valuable insights for urban planners and designers seeking to balance cultural continuity with contemporary residential needs in historic urban areas.

Keywords: Service Design; Historic Urban Districts; Cultural Preservation; Community Engagement

Introduction

The lifestyle of residents in historic urban areas is shaped by a unique blend of cultural traditions, historical architecture, and evolving socio-economic conditions. Historic urban areas are characterized by their rich heritage, traditional housing structures, and long-standing community networks that distinguish them from modern urban developments. According to Ashworth and Tunbridge (2017), these areas often serve as cultural and economic hubs, where residents maintain traditional lifestyles while adapting to contemporary urban demands. However, as urbanization intensifies, these residents face challenges such as gentrification, rising living costs, and pressures to modernize their environments while preserving historical authenticity. The balance between maintaining cultural heritage and adapting to modern conveniences influences the daily lives of residents, shaping their interactions, economic activities, and overall quality of life.

Social and economic activities in historic urban areas often revolve around local markets, small-scale businesses, and traditional crafts, which contribute to the cultural identity of these spaces. Unlike residents in newly developed urban zones, those living in historic areas typically engage in heritage-based economic activities such as artisanal production, tourism-related services, and community-based enterprises (Gu & Ryan, 2020). These activities foster a strong sense of place and local identity, reinforcing traditional social structures and community relationships. However, as tourism and commercialization expand in historic urban centers, there is growing concern about the displacement of residents and the transformation of these areas into commodified cultural spaces catering primarily to visitors rather than long-term inhabitants. The economic shifts in historic urban areas thus have a direct impact on the lifestyle choices of residents, influencing their employment patterns, housing stability, and cultural engagement.

Infrastructure and urban policies also play a significant role in shaping the lifestyle of residents in historic urban areas. While these districts often benefit from preservation efforts aimed at maintaining architectural integrity and cultural significance, they also experience challenges related to outdated infrastructure, inadequate public services, and limited accessibility to modern amenities (Tiesdell, Oc, & Heath, 2018). Government and municipal policies must balance heritage conservation with the provision of essential services to ensure that historic urban areas remain livable for their residents. In many cases, urban renewal projects and adaptive reuse strategies have been implemented to modernize infrastructure while



retaining historical authenticity. The effectiveness of such initiatives determines the extent to which residents can continue their traditional lifestyles while integrating into the evolving urban environment.

Menxi area, as a historic urban district with profound cultural heritage, faces dual pressures during the modernization process: protecting traditional culture while meeting the contemporary needs of its residents. There is often a significant tension between the preservation of historic districts and the demands of modernization. Traditional historic buildings and urban structures may lack the convenience required for modern living, while the introduction of modern facilities could potentially threaten the integrity of historical and cultural assets. Therefore, how to preserve historical cultural heritage while improving the quality of life for residents has become a central issue in the ongoing renewal of the Menxi area.

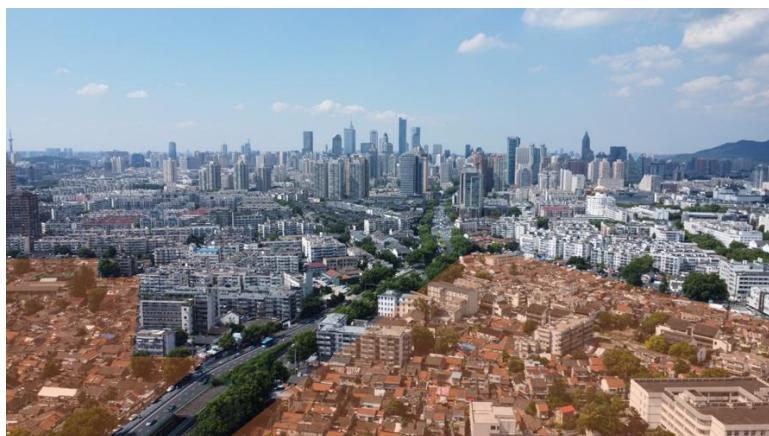


Figure 1 Menxi area

Source: By the author

This study aims to explore how to address this issue through systematic design approaches under the framework of service design. By optimizing service processes and enhancing user experiences, service design not only effectively improves the daily living conditions of residents but also ensures the continuity of historical culture while accommodating modern needs. Hence, identifying the significance of the research problem lies in providing new approaches for the renewal of historic districts through service design. This effort not only contributes to enhancing the quality of life for residents in the Menxi area but also offers actionable solutions for the renewal of similar historic districts.

The significance of the research problem lies in offering an innovative approach to balance the preservation of traditional culture and the needs of modernization in the renewal of historic districts. Through service design, it is possible to systematically identify and address the practical challenges faced by residents of historic districts during modernization, thereby improving their quality of life.

Specifically, this study contributes to:

Providing new approaches for the preservation and development of historic districts:

This study applies service design to explore innovative solutions for the preservation and development of historic districts using user-centered design thinking. This approach not only optimizes the service systems of historic districts but also ensures the continuity of cultural heritage, facilitating the organic integration of heritage conservation and modern demands.

Enhancing residents' quality of life and sense of well-being:

Through service design methods, this study aims to improve the quality of life, sense of well-being, and community cohesion among residents in historic districts. It helps optimize their daily living experiences, particularly in densely populated urban environments, while mitigating the negative impacts of modernization.

Providing a basis for policymaking and urban planning:

This study offers a service design framework grounded in practical needs for urban planners and policymakers. By ensuring cultural preservation, it facilitates the formulation of policies that meet modern living requirements and promote the sustainable development of historic districts.



Research Objectives

The primary aim of this study is to explore how service design methods can improve the lifestyles of residents in historic districts and provide theoretical and practical guidance for the renewal of similar areas. The specific research objectives are as follows:

1. To analyze the current status and challenges of the Menxi area as a historic district: This study seeks to identify the primary conflicts between the preservation of traditional culture and the demands of modernization in the Menxi area. Through in-depth research into the lifestyles and needs of residents, it aims to pinpoint the pressing issues that require resolution during the renewal process, providing foundational data and theoretical support for subsequent design solutions.

2. To explore the application of service design methods in the renewal of historic districts: Service design goes beyond the physical transformation of spaces, emphasizing the optimization of service processes and the fulfillment of residents' needs. By integrating the preservation of historical culture with the requirements of modern living, this study will propose an innovative renewal strategy based on service design, aiming to enhance residents' quality of life while respecting cultural heritage.

3. To propose a feasible framework for balancing traditional culture and modernization in historic district renewal: The goal is to develop a systematic solution that combines theory and practice to guide the renewal of the Menxi area and similar historic districts. This study aims to provide a model for future service design initiatives in historic districts, offering valuable insights into cultural heritage preservation and urban renewal in related urban settings.

Literature Review

Service design has emerged as an innovative design methodology that has gained global recognition in urban renewal and the revitalization of historic districts (Zhang, 2018). Centered on user experience, service design aims to resolve complex social issues by optimizing service processes and enhancing user satisfaction. In the context of historic district renewal, service design offers an interdisciplinary perspective, facilitating collaboration among urban planners, designers, and residents to create solutions that respect historical culture while meeting modern demands. Below is a review of studies relevant to service design and historic district renewal:

Theoretical Framework and Applications of Service Design

The theoretical framework of service design is rooted in interdisciplinary collaboration and systematic thinking. It goes beyond the design of physical products or spaces, focusing instead on service processes, user experiences, and the optimization of supporting systems. Through methods such as user research, service blueprints, and prototyping, service design addresses practical issues in fields such as public services and community building.

In the renewal of historic districts, service design is primarily applied in two ways: Enhancing residents' daily lives and community services. Designing systematic service processes to address issues related to public services and facility management in traditional neighborhoods.

Scholars and designers have explored the role of service design in historic district renewal. Han (2022) proposed that service design could integrate historical cultural elements with modern services through "cultural embedding." This approach enables solutions that meet residents' daily needs while preserving the unique identity of the area. Such strategies ensure that cultural heritage is not marginalized but gains new vitality in the process of modernization.

Applications of Service Design in Historic District Renewal

Renewal of historic districts involves not only the physical upgrading of spaces but also the balance between cultural heritage preservation and modern demands. Service design introduces innovative approaches to renewal, focusing on aspects such as community service optimization, public space redesign, and enhancing resident interaction and cultural identity.

For instance, Barcelona's "Raval Community Revitalization Project" successfully applied service design principles in its historic district renewal. The project improved community public services, increased spaces for resident interaction, and incorporated local historical culture, ultimately enhancing residents' quality of life and revitalizing community culture (Kim, 2018). Such cases demonstrate that service design can provide sustainable solutions for historic district renewal by optimizing service





processes, enhancing community functions, and fostering a sense of belonging and participation among residents.

Moreover, service design helps address the tension between traditional conservation methods and modernization needs. Conventional renewal efforts often focus heavily on the preservation of physical structures, neglecting the living needs and social interactions of residents. Service design bridges this gap by integrating services that improve the residents' experience and strengthen their cultural identity.

In the case of the Menxi area, service design can optimize the interaction between residents and the historic district. By designing appropriate cultural activities and improving internal services, service design can organically combine historical and modern needs, thereby enhancing the district's cultural appeal and functionality.

The Role of Service Design in Cultural Preservation of Historic Districts

Service design not only addresses the functional needs of residents but also plays a unique role in cultural preservation (Tao, 2021). Traditional methods of conserving historic districts often face challenges of either cultural stagnation or obsolescence. Service design offers a way to leverage existing cultural resources innovatively, creating service forms that align with modern living needs while maintaining cultural authenticity.

A critical aspect of service design is its emphasis on "user participation." By involving residents and community members in the design process, their needs and suggestions are incorporated, ensuring that cultural heritage is revitalized during the renewal process. For example, Amsterdam's "Amsterdam Noord" historic district renewal project used service design methods to encourage residents to participate in public space redesign, ensuring the preservation and innovation of historical cultural elements in a contemporary context (Kimbell, 2011). These examples highlight that service design enhances community participation, ensuring cultural heritage is not only preserved but also revitalized in modern contexts.

Service design offers an innovative approach to historic district renewal. By improving community services, optimizing resident interaction, and emphasizing cultural preservation, service design enhances the functionality of historic districts and the quality of life for their residents. It provides a sustainable development pathway that respects historical culture while addressing modern needs, offering valuable insights for similar renewal projects.

Conceptual Framework

This study proposes the following implementation path:

Research and Needs Analysis: Through methods such as resident interviews and questionnaires, the study seeks to gain an in-depth understanding of the living needs, cultural identity, and renovation expectations of residents in the Menxi area. This will provide data support for subsequent design efforts.

Design Plan Development Based on the research results and in combination with the principles of service design, the study will propose design plans focusing on optimizing resident services, transforming public spaces, and enhancing community interactions. The plans will ensure a balance between cultural preservation and modern functionality.

Prototype Testing and Feedback: Design prototypes will be developed and evaluated by residents and other stakeholders. Feedback will be collected to continuously optimize the design plans, ensuring they meet community needs and effectively improve residents' quality of life.

Implementation and Evaluation: The finalized design plans will be implemented, followed by long-term evaluations to assess their impact on cultural heritage preservation, improvement in residents' quality of life, and community sustainability.



Service Design Implementation Framework in Menxi area



Figure 2 Framework

Methodology

In order to achieve the research objectives, this study will adopt a variety of research methods, combining qualitative and quantitative approaches to ensure a comprehensive and in-depth analysis of the current situation and renovation needs of the Menxi area's historic district, as well as to explore the application of service design. The specific research methods are as follows:

This study will conduct a literature review and case analysis to comprehensively sort out the theories of historic district renovation and the application of service design. By reviewing research achievements in related fields and analyzing successful historic district renovation cases both domestically and internationally, the study will summarize the application experience of service design in similar contexts. This method will provide a theoretical framework for the research and serve as a reference for subsequent field investigations and design plans.

This study will carry out field investigations and resident interviews to gain an in-depth understanding of the daily life needs, cultural identity, and renovation expectations of the residents in the Menxi area through qualitative research methods. Using questionnaires, in-depth interviews, and other approaches, data will be collected on residents' views of the current situation of the historic district, renovation needs, and suggestions on the potential changes that service design could bring. This step will help the research team better understand the core needs of historic district residents and provide data support for subsequent design strategies.

This study will use design experiments and plan evaluation methods. Based on the results of preliminary investigations and combined with the principles and methods of service design, a series of renovation plans based on service design will be proposed. Through feedback and participation from relevant stakeholders, the design plans will be further refined, and their implementation will be simulated in experimental environments. The plans will be evaluated for their balance and feasibility in improving residents' quality of life, meeting modernization demands, and preserving cultural heritage. Through this process, the study will provide specific operational frameworks and practical guidance for the renovation of the Menxi area and other similar historic districts.

This study adopts a diversified approach combining literature review, field investigations, resident interviews, and design experiments, aiming to explore from multiple dimensions how to improve the lifestyles of residents in historic districts through service design, while also promoting the inheritance and innovative development of cultural heritage.

Results

Through surveys and data analysis, this study revealed the core needs of residents in the Menxi area regarding the renovation of historic neighborhoods, which focus on greening, age-friendly furniture design, and spiritual and cultural life. Based on these needs, the study developed and proposed the "Seed Project," a public welfare initiative aimed at improving residents' quality of life through innovative design while preserving historical culture. The detailed results, including data analysis and specific dimensions of project implementation, are as follows:

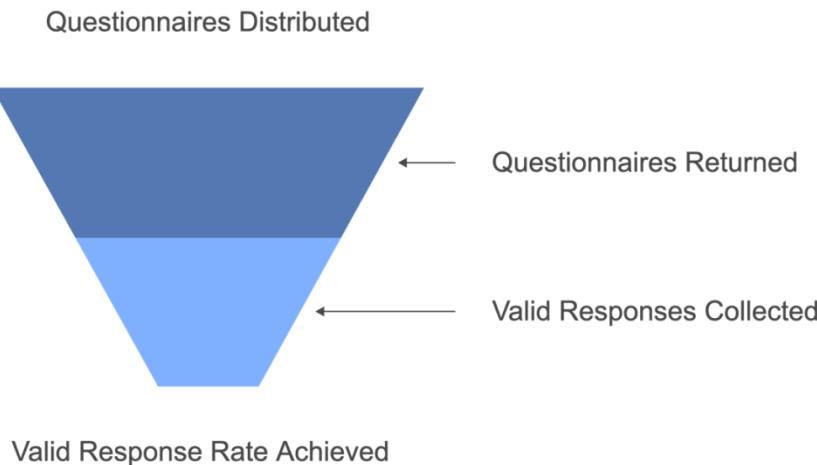


Figure 3 Questionnaire Response Process

Sample Description

A total of 300 questionnaires were distributed, and 273 valid responses were collected, achieving a valid response rate of 91%. The sample included permanent residents of the Menxi area, covering groups of different age ranges, genders, and educational levels. The sample distribution is as follows:

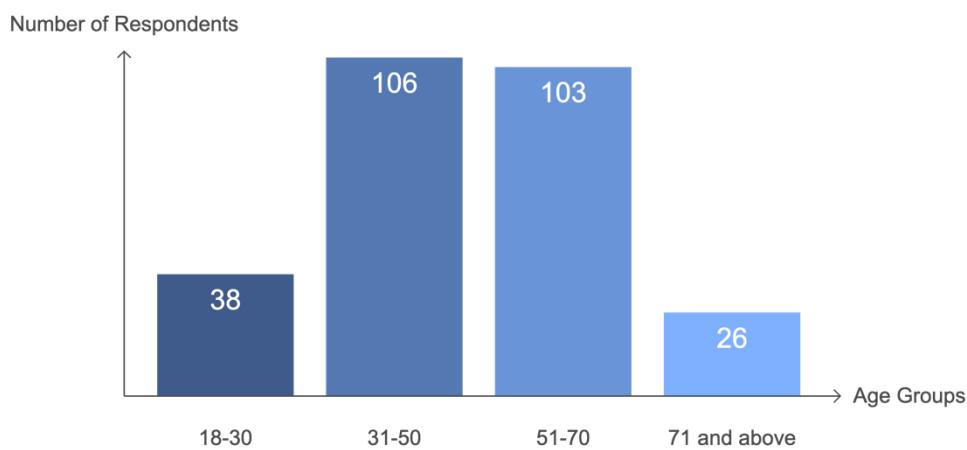


Figure 4 Age Distribution of Survey Respondents

Data Analysis and Validation

To ensure the reliability of the data, SPSS software was used for a detailed analysis of the survey results. The main findings are as follows:

Cronbach's Alpha Coefficient:

The overall Cronbach's Alpha coefficient for the questionnaire was 0.89, indicating good internal consistency.

The Cronbach's Alpha coefficient for the greening needs dimension was 0.86, for age-friendly furniture design was 0.82, and for spiritual and cultural needs was 0.85, all meeting the standard for high reliability.

Factor Analysis:

Exploratory Factor Analysis (EFA) was conducted, with the Kaiser-Meyer-Olkin (KMO) value calculated at 0.85 and Bartlett's test of sphericity showing significance ($p < 0.001$), indicating that the data were suitable for factor analysis.

Three principal components were extracted, corresponding to greening needs, age-friendly furniture design needs, and spiritual and cultural needs, which explained 68.2% of the total variance.

Correlation Analysis:

The correlation coefficient between greening needs and quality of life was 0.78 ($p < 0.01$).

The correlation coefficient between age-friendly furniture design needs and residents' sense of safety was 0.73 ($p < 0.01$).

The correlation coefficient between spiritual and cultural needs and community belonging was 0.71 ($p < 0.01$).

Table 1 Correlation Analysis

Demand type	Correlation coefficient with quality of life	Significance
Greening demand	0.78	$p < 0.01$
Age-friendly furniture design	0.73	$p < 0.01$
Spiritual and cultural needs	0.71	$p < 0.01$

Key Survey Findings

The questionnaire survey revealed the core needs of residents in the Menxi area of Nanjing regarding the renovation of historic neighborhoods. These needs are concentrated in the following three aspects:

Greening Needs

Greening was the most prominent aspect of residents' renovation demands, with 72% of respondents expressing a desire for more greenery in the neighborhood, particularly in public spaces and along streets. Residents generally believe that greening can improve air quality, enhance the aesthetic appeal of the living environment, and increase the livability of the community.

Age-Friendly Furniture Design Needs

Age-friendly furniture design needs were especially significant among elderly residents, with 65% of respondents indicating a preference for furniture designs tailored to the habits of older adults, such as convenient seating and kitchen tools. Such designs are seen as effective in reducing inconveniences in daily life and improving comfort and safety in living spaces.

Spiritual and Cultural Life Needs

58% of residents expressed a desire for the renovation to incorporate more cultural activities and interactive spaces, such as community cultural activity rooms and historical culture exhibitions. These additions are expected to enhance residents' sense of spiritual well-being and cultural identity.

"Seed Project" Public Welfare Project Design Dimensions

Based on the results of the questionnaire survey, this study proposes and designs a public welfare project named "Seed Project," which aims to address the residents' needs and improve their lifestyle through specific designs. The project is divided into the following dimensions:

Greening Dimension

Greening is one of the primary demands of residents in the renovation of the Menxi area of Nanjing. According to the survey, more than 70% of residents expressed a desire for more greenery, especially in public spaces, sidewalks, and rooftops. Residents generally believe that greening can not only improve the living environment but also enhance air quality, increase visual beauty, and enhance the community's livability and comfort.

To meet this demand, the project proposes the use of biodegradable, recycled paper embedded with seeds. The recycled paper is made from eco-friendly materials that can decompose quickly upon contact with moisture. The embedded sunflower and small tomato seeds will germinate and grow in the soil. Residents can easily plant these recycled papers in their private gardens or public green spaces in the neighborhood, gradually adding more greenery to the area. This design not only promotes the growth of plants but also provides residents with an opportunity to actively participate in greening efforts, allowing them to contribute to environmental improvement.

In addition to environmental improvements, the planting activities help raise residents' environmental awareness and strengthen their sense of community belonging and responsibility. Through this interactive greening approach, residents can directly experience the benefits brought by environmental changes, further enhancing their sense of identification with the community. In the future, this greening plan could be promoted in other similar historical neighborhood renovation projects, forming a virtuous cycle and promoting the sustainable development of cities.



Figure 4 Design proposal

Source: By the author



Figure 5 Seed paper

Source: By the author

Age-Friendly Furniture Design Dimension

In terms of age-friendly furniture design, the survey data shows that elderly residents have the most urgent need for furniture design. Over 65% of respondents expressed a desire for furniture that caters to the needs of older adults, particularly in terms of comfort, safety, and functionality. Age-friendly design not only improves the living conditions for elderly people but also significantly enhances their quality of life by reducing the inconvenience caused by unreasonable living spaces or inappropriate furniture.

To address this need, the project proposes the use of aluminum profiles to design age-friendly furniture. The unique advantages of aluminum profiles lie in their lightweight, durable, and easy-to-

process features, allowing the furniture to be customized based on the specific needs of different elderly groups. For example, the height of seats can be adjusted according to the height and needs of elderly users, and the angle of the tabletop and the positioning of chairs can also be adjusted based on personal comfort. Additionally, the strong adjustability and flexibility of aluminum profiles enable elderly people to reassemble furniture as needed, maximizing the use of limited space.

Age-friendly furniture not only provides greater convenience but also effectively enhances the sense of safety for elderly residents. By optimizing the design of furniture to better suit elderly people's usage habits, the risk of accidental injuries can be reduced, further improving the independence and confidence of elderly residents. Particularly in Menxi, where many elderly individuals live alone, this customized furniture design can provide them with greater comfort and safety in their homes.



Figure 6 Age-Friendly Furniture
Source: By the author

Spiritual and Cultural Life Dimension

Regarding spiritual and cultural life, residents in the Menxi area of Nanjing generally expressed that the inheritance and exhibition of historical culture is another important expectation for community renovation. Survey data shows that over 58% of residents hope that more cultural activities and historical education resources be incorporated into the renovation to enhance their cultural identity and sense of belonging. They believe that understanding the historical background and cultural heritage of the area in which they live helps increase their love and pride for the place.

To meet this need, the project proposes compiling the historical culture of the Menxi area into a booklet. The content will include information on historical figures, traditional culture, and the historical changes of the neighborhood. Through this booklet, residents will not only learn about the connections between the area and historical figures but also understand the rich cultural foundation of the land through words, pictures, and concise historical narratives. The booklet will be distributed for free to residents, particularly to elderly groups, allowing them to revisit their living area and rediscover the historical value and cultural heritage embedded in it.

In addition to distributing the booklet, regular community cultural activities can also be organized, such as history lectures and cultural tours, allowing residents to further experience the charm of traditional culture through active participation. These activities not only enrich the spiritual life of residents but also stimulate their interest in history, enhancing their cultural confidence and sense of belonging to their home.

By enhancing spiritual and cultural life, the residents of Menxi will not only experience material changes brought by the renovation but also establish a deeper connection with the city and history on a spiritual level. This will further promote the sense of community belonging and social responsibility among residents, helping them build stronger collective awareness and form a positive and progressive community atmosphere.



Discussion

This study demonstrates that service design can effectively address the diverse needs of residents in the Menxi area while supporting sustainable urban renewal. The proposed solutions—enhancing greenery, designing elderly-friendly furniture, and fostering cultural engagement—not only improve living conditions but also strengthen community cohesion. For instance, the use of biodegradable seed-embedded paper enables residents to actively participate in greening efforts, promoting environmental awareness and a sense of belonging. Similarly, elderly-friendly furniture designs prioritize functionality and safety, meeting the practical needs of an aging population. The cultural initiatives, such as historical booklets and activities, enrich residents' understanding of local heritage, boosting cultural pride and identity.

These findings suggest that integrating practical and cultural dimensions through service design can create a balanced approach to urban renewal. However, potential challenges must be considered. The success of greening initiatives depends on sustained community participation, which may decline over time. Additionally, the maintenance and affordability of elderly-friendly furniture could pose financial burdens for some residents. Cultural engagement efforts, while fostering identity, may also inadvertently exclude certain groups or reinforce nostalgic perspectives that resist necessary modernization. Further research is needed to assess the long-term impact and adaptability of these strategies in similar historical contexts.

Recommendation

This study proposes three major design solutions—greenery, elderly-friendly furniture, and spiritual cultural life—using service design methods to address the needs of residents in the Menxi area of Nanjing's historic district. These solutions not only improve the quality of life for residents but also promote the inheritance of historical culture. Through participatory design, the sense of community belonging among residents has been enhanced, providing a reference for the renovation of similar historic districts.

Service design is an effective tool to balance cultural preservation and modern needs in the renovation of historic districts. The design solutions should focus on the actual needs of residents, combine local characteristics, and be flexible. By focusing on greenery, elderly-friendly design, and spiritual cultural life, the quality of life for residents can be improved, and community cohesion can be strengthened.

Future research can focus on the following areas:

Long-term effect evaluation: Track the long-term impact of the design solutions, especially in terms of greenery and elderly-friendly designs.

Cross-regional comparison: Study the application of service design in historic districts in different regions, seeking broader solutions.

Technology integration: Explore how smart and digital technologies can be integrated with service design to enhance the functionality and resident experience of historic districts.

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