

Enhancing Digital Services in Parks through User Experience Design

Liping Liu, Le Zheng, Zhong Ren*

Xi'an Eurasia University, Xi'an, Shaanxi, China

** Corresponding Author.*

Abstract: This research investigates the pivotal role of user experience (UX) design in amplifying digital services within park environments. Focusing on the Xi'an Ba River Left Bank Eco-Sports Park digital platform project, the study scrutinizes the impact of UX design methodologies on enriching park digital services. Employing a fusion of theoretical UX principles and practical applications, methodologies such as design thinking, user surveys, A/B testing, and focus group discussions were integrated to elevate user satisfaction. The successful implementation of digital services, including the smart tour system and interactive information display wall, garnered positive user reception, culminating in amplified park management efficiency and enriched user experiences. The study concludes by advocating continual design refinement and the integration of advanced technologies to craft a more user-oriented and sophisticated digital experience within park settings.

Keywords: Park Digital Services; User Experience; User Experience Design; Park Management

1. Introduction

1.1 Background

Under the general trend of rapid social development and continuous technological progress, park digital services have emerged as a new engine for national fitness. The digital platform project of Xi'an Ba River Left Bank Eco-Sports Park was born in response to the trend, injecting innovative elements into the park experience. The purpose of this paper is to study the key role of user experience design in park digital services, and to analyze the design and practice of the digital platform

project in improving user experience by taking the Ba River Left Bank Eco-Sports Park as a typical case, so as to provide an in-depth analysis of the integration of national fitness and digital services. Through the empirical study of the Ba River Left Bank Eco-Sports Park, we will gain an in-depth understanding of the actual effects of digital services in increasing user participation, conveying health concepts, and providing convenient services. This study will not only provide practical guidance for park managers, but also provide useful experiences and insights for the future development of digital services.

1.2 Research Questions and Objectives

This research question focuses on the clever optimization of park digital services through subtle user experience design to make them closer to users' needs, so as to enhance user satisfaction and engagement. It is committed to providing practical experience and inspiration for park managers, urban planners and practitioners, and promoting more public places to the forefront of digital services, so as to jointly construct a smarter and more convenient urban life. Through in-depth research on the key role of user experience design in park digital services, this study will provide practical guidance for the development of digital services and help cities develop in a smarter, user-friendly direction.

1.3 Significance of the Study

The significance of this study lies in its potential to address critical gaps and contribute to the field of park digital services and user experience design. As society increasingly embraces technological advancements, parks are evolving into digitally augmented spaces. Understanding the role of user experience design in enhancing these digital services becomes

crucial. This study seeks to unravel the significance of user-centric design principles in reshaping park environments, optimizing user experiences, and fostering stronger connections between users and park spaces. By exploring the multifaceted aspects of digital service integration in parks, this research aims to offer insights that could revolutionize the way parks are perceived, utilized, and managed in the contemporary landscape. The findings are anticipated to benefit park administrators, designers, and stakeholders by providing actionable strategies to elevate digital services and cultivate more engaging, user-oriented park experiences.

2. Introduction to Park Digital Services

Park digital service is an innovative way to integrate information, interaction and convenience into park management and experience with the help of modern technology. The concept is derived from a sensitive perception of the trend of social digitization, aiming to provide parks with smarter, more convenient and interactive services to meet the ever-changing demands of urban life. By integrating intelligent systems, mobile applications and interactive platforms, park digital services aim to improve management efficiency, enhance user engagement and create rich cultural experiences. The goal is to transform traditional parks into digital smart places, creating more interesting and personalized recreational spaces for city residents and making parks a more interactive and convenient part of urban life. This innovative concept will inject new vitality into urban public spaces and truly integrate parks into the digital age.

2.1 Definition of Park Digital Services

Park digital services transcend simple digital displays, embracing a holistic digital integration that spans virtual tours, interactive information displays, fitness data collection, and more. This convergence of modern technology with park spaces facilitates a multifaceted expansion of park functions. The virtual tour system invites visitors to explore every nook of the park, while the interactive information display offers a wealth of cultural and activity information. Simultaneously, the

fitness data collection feature provides personalized fitness guidance. This diverse digital service not only enhances the overall park experience but also caters to the varied needs of different user groups. It transforms the park into a contemporary leisure destination that seamlessly integrates culture, health, and technology[1].

2.2 Characteristics and Functions of Park Digital Services

Digital services infuse parks with distinctive features and functions. The virtual tour system provides visitors with profound insights into the park's history, culture, and ecology, fostering a deeper connection. Simultaneously, the interactive information display delivers real-time updates on park activities and services, enhancing the overall user experience. Additionally, digital services enable the collection of user exercise data through intelligent fitness equipment, offering park managers precise insights into fitness demands[2]. This multifaceted approach not only enriches visitor engagement but also provides invaluable data for informed park management decisions. The seamless integration of these digital elements enhances the park's allure, transforming it into a dynamic and responsive space that caters to the diverse interests of visitors.

2.3 Demand and Importance of Modern Society

In the contemporary urban landscape, the increasing pursuit of an elevated quality of life propels the transformation of urban spaces, with parks emerging as central hubs for leisure and fitness. The integration of digital services has become a pivotal strategy to meet the expanding demand, signifying not only technological advancement but also a response to the evolving needs of urban residents. By embracing digital services, parks transcend conventional boundaries, providing residents with more convenient and personalized experiences. These intelligent interventions not only streamline various park-related processes but also cultivate a heightened sense of engagement between parks and their surrounding communities[3]. Consequently, the introduction of digital services in parks signifies a transformative approach, reshaping these spaces into

dynamic, interactive, and responsive environments that significantly contribute to the overall well-being and satisfaction of urban residents.

2.4 Successful Case Presentations

In this segment, we will explore several exemplary cases of park digital services, shedding light on their application effects and social impact across diverse scenarios. Through an in-depth examination of these success stories, their goal is to offer a comprehensive understanding of how digital services have been strategically integrated into various park settings. These cases serve as valuable illustrations, showcasing the versatility and effectiveness of digital solutions in enhancing user experiences, optimizing park management, and fostering positive societal outcomes. Through a meticulous exploration of these instances, we aim to underscore the transformative potential of digital services in shaping the contemporary landscape of urban parks and their broader implications for community well-being and engagement.

2.4.1 Case 1: Smart Guide System

Taking the Summer Palace in Beijing as an exemplar, a smart tour guide system has been implemented. Utilizing mobile apps or designated devices within the park, visitors can access real-time, detailed information about each attraction in the Summer Palace, encompassing historical background and plant details. This system not only enriches visitor engagement but also encourages a broader audience to delve deeper into the cultural significance of the Summer Palace. Through the digital tour, visitors can tailor the information to their interests, immersing themselves in the history and scenery of the Summer Palace. Simultaneously, the system gathers user feedback and behavioral data, providing the park with a foundation for continuous improvement and optimization. This smart guide system stands as a paradigm for digital services within the Summer Palace, offering valuable insights for other parks aspiring to undergo digital transformation.

2.4.2 Case 2: Interactive information display wall

In another instance, Shanghai World Expo Park introduced an interactive information display wall, showcasing real-time activities,

weather updates, and user messages on a large screen. This digital display not only intensifies the interaction between the park and its visitors but also augments satisfaction with the park's services, transforming it into a hub for community engagement [4]. By fostering interactions such as leaving messages, sharing experiences, and offering suggestions, visitors contribute to a communal space that enhances communication among community members. The interactive message display wall serves not only as an information conduit but also cultivates a community atmosphere of shared participation, positioning the park as a focal point for community life in the digital age. This innovative initiative stands as a compelling exemplar of successful park digital services, providing valuable insights for the digital transformation of other parks.

2.4.3 Case 3: Intelligent Fitness Equipment

In Huangpu Riverside Park, Shanghai, intelligent fitness equipment has been introduced, allowing users to engage in fitness exercises while the system records real-time exercise data and offers personalized fitness guidance. This initiative not only fosters a fitness-friendly environment within the park but also equips park managers with extensive user behavior data, aiding in the optimization of the park's operational strategy. By incorporating digital fitness equipment, Huangpu Riverside Park has seamlessly integrated into the healthy lifestyles of urban residents, enhancing the overall user experience while providing crucial support for the park's sustainable development.

The in-depth analysis of these successful cases underscores the effectiveness of digital services across diverse domains. Their practical significance in elevating user experiences, fostering community interaction, and offering precise data support for park management is evident. These cases serve as empirical foundations for the subsequent chapters, contributing to a nuanced understanding of digital services in park environments.

3. The Criticality of User Experience Design in Park Digital Services

This section delves deeply into the pivotal role of UX design in park digital services. Through a systematic analysis of user

experience design principles and methods, complemented by practical case studies, their objective is to offer valuable experiences and insights for the design and implementation of park digital services.

3.1 Principles of User Experience Design

3.1.1 Humanization Design

This section meticulously explores humanized design principles to ensure that digital services seamlessly align with users' cognitive and behavioral habits, optimizing their ease of use. Through an in-depth examination of user psychology and behavior, the aim is to unravel strategies that prioritize user needs throughout the design process. This comprehensive understanding facilitates the creation of more humanized and user-friendly digital services. By integrating these insights, the park's digital experience not only advances technologically but also resonates personally with users. The emphasis on human-centered design seeks to enhance the overall comfort and satisfaction of park visitors, contributing to a harmonious and enjoyable digital encounter within the park environment[5]. The strategic implementation of these principles underscores a commitment to fostering user engagement and ensuring that the digital services cater to the diverse needs and preferences of the park's visitors.

3.1.2 Emotional experience design

In this exploration, we underscore the significance of emotional experience design within the realm of digital services, emphasizing the precise delivery of positive emotional encounters. Their focus lies in cultivating a profound emotional connection between users and the park, transcending the conventional perception of digital services as mere technical tools. Instead, we envision these services as dynamic and interactive platforms capable of eliciting emotional resonance. Through meticulous emotional design strategies, we are dedicated to ensuring that digital services go beyond functionality, becoming conduits for meaningful and emotionally enriching interactions [6]. By delving into the nuanced emotional needs of users, we aim to provide practical methods for infusing warmth and a human touch into the park's digital services. This approach seeks to elevate users' experiences from transactional engagements to deep emotional connections

with the park, fostering a sense of attachment and satisfaction that extends beyond mere utility.

3.2 User Experience Design Methods

3.2.1 User journey map design

The User Journey Map design method, as a fundamental technique in user experience design, plays a pivotal role in understanding the user's holistic experience within the park [7]. Through meticulous mapping of the user's journey, we gain insights into their interaction with digital services, allowing for the identification of user needs and pain points. This method goes beyond surface-level observations, delving into the behavioral and emotional shifts users undergo during their park visit.

The insights derived from user journey mapping not only unveil the nuanced aspects of user experiences but also furnish valuable data for park managers to optimize various dimensions of digital services [8]. By delving into user journeys with depth and precision, this study aims to offer practical guidance for designing digital services that closely align with users' expectations and needs. Through this user-centric approach, the design not only meets functional requirements but also enhances the overall user experience, contributing to a more seamless and satisfying digital encounter within the park environment.

3.2.2 User Survey and Feedback Collection

The continual enhancement of user experience hinges on active user participation, and a thorough examination of user surveys and feedback collection methods is pivotal for realizing this ongoing improvement. Regular user surveys serve as a direct avenue to comprehend users' genuine sentiments and needs. Simultaneously, the feedback collection system facilitates the timely acquisition of users' opinions and suggestions concerning digital services[9]. This cyclical mechanism of user involvement emerges as a fundamental catalyst for optimizing digital services.

By fostering a continuous user engagement approach, this study strives to serve as a guiding force for park managers in ensuring that digital services align seamlessly with user expectations. The iterative nature of user participation, coupled with the insights gleaned from surveys and feedback,

contributes significantly to the perpetual refinement of the park's digital experience. In essence, this model not only prioritizes user perspectives but also acts as a dynamic feedback loop for continual enhancements, reinforcing the commitment to delivering a digital experience that resonates with users and evolves in tandem with their evolving expectations.

3.3 Case Study and Empirical Research

The detailed case study and empirical research aim to verify the actual effect of UX design on park digital services. Taking a specific park as an example, "Cuihu Park" is selected to introduce a smart guide system for case study and empirical research, verifying the impact of UX design on park digital services. The smart guide system of Cuihu Park combines a mobile app and park equipment to provide visitors with real-time attraction information, historical background, and recommendations for special activities. Through user interaction on the system, Cuihu Park managers can collect visitors' preferences and feedback. The empirical study will gather user data and feedback to explore in-depth the impact of the smart guide system on user experience, including emotional experience, behavioral changes, and overall satisfaction. The comprehensive study of Cuihu Park aims to provide practical insights for park managers and design practitioners, offering robust support for the design and optimization of future digital services[10].

4. Design and Practice

User experience design played a pivotal role in the Ba River Left Bank Ecological Sports Park digital platform project. The design team placed a strong emphasis on meeting user expectations by conducting thorough user research and requirements analysis, coupled with iterative prototyping. In practice, a design thinking approach was employed, highlighting user engagement and feedback as key components. Continuous optimization of the user experience was achieved through A/B testing and focus group discussions.

The outcomes underscore the success of the design and implementation of digital services, leading to substantial improvements in user satisfaction and the overall effectiveness of

digital offerings. The integration of user-centric principles and iterative design methodologies not only enhanced the usability of the digital platform but also ensured that it resonated effectively with the diverse needs and preferences of park visitors.

4.1 Design Process

The design process commenced with an in-depth needs analysis, collaboratively clarifying user expectations and park features in close coordination with Ba River Left Bank Ecological Sports Park managers and user representatives. The design team then embarked on prototyping, elucidating the basic framework and functionality of the digital service. User engagement was prioritized, leading to multiple iterations to ensure alignment with user expectations. Employing a design thinking approach, the team focused on user needs and swiftly validated the design solution through activities like brainstorming and prototyping. Concurrently, A/B testing was employed to collect user data for feedback, facilitating further optimizations to the design [11]. Throughout the design process, focus group discussions were leveraged to gather profound user feedback, significantly influencing the refined design of the digital services. This comprehensive design methodology ensures that the digital services cater to user needs while seamlessly integrating with the park's characteristics, offering a smarter and more convenient experience for users.

4.2 Practice Methods

In practice, the design team embraced the "Design Thinking" approach, placing a strong emphasis on user-centered principles that prioritize user participation and feedback. Initially, an in-depth user research and demand analysis facilitated the creation of a clear user profile. Subsequent stages involved brainstorming and prototyping to swiftly validate the design solution. Through the implementation of A/B testing, real-time user data was collected, enabling continuous optimization of the design to enhance user experience. Focus group discussions emerged as a powerful tool for obtaining profound user feedback, offering a more comprehensive understanding of the design. Regular user surveys, feedback collection, and close

communication with park managers ensured the design's responsiveness to actual needs. The adaptability and feedback loop inherent in this pragmatic approach significantly contributed to the continuous optimization and enhancement of the digital service, guaranteeing optimal user experience and functionality.

4.3 Results and Impacts

The integration of design and practice within the Ba River Left Bank Eco-Sports Park digital platform project yielded significant results and positive outcomes. Firstly, meticulous optimization of user experience design led to a notable enhancement in overall user satisfaction with the digital service. User engagement witnessed a substantial increase, culminating in a smarter and more convenient experience. Secondly, successful case demonstrations of various digital services, including the smart guide system, interactive information display wall, and intelligent fitness equipment, garnered widespread recognition and praise from users. The flexible application of practical methods facilitated continuous iterative improvements to the digital services, delivering functionalities and experiences that better aligned with user expectations. Ultimately, the digital platform project achieved mutually beneficial outcomes in terms of park management efficiency and user experience, establishing a sustainable foundation for the park's digital services. These conclusive results underscore the pivotal role of user experience design in digital services, offering valuable insights and references for analogous projects.

5. Conclusion

In conclusion, this study meticulously explores the paramount importance of User Experience (UX) design in the realm of park digital services, employing the Ba River Left Bank Eco-Sports Park digital platform project as an illustrative case. By unwaveringly adhering to the tenets and methodologies of UX design, the research adeptly showcases the seamless fusion of design theory with practical application. The palpable outcomes include substantial enhancements in user satisfaction, establishing a robust foundation for the ongoing evolution of park digital

services. The insights gleaned from this study not only underscore the success of the Ba River project but also serve as invaluable guidance for future endeavors, underscoring the pivotal role of user-centric design principles in shaping the digital services landscape within park environments.

Looking forward, the commitment to continuous improvement remains resolute. Future design enhancements will feature the integration of cutting-edge technologies, ensuring a park digital experience that is not only more intelligent but also finely attuned to the diverse needs of users. A proactive approach to user feedback and vigilant tracking of digital technology trends will guide these efforts, fostering ongoing innovation and optimization. This dynamic strategy aims to adapt to societal changes and the evolving needs of users, propelling park digital services toward a future characterized by heightened intelligence, convenience, and alignment with user expectations. This sustained dedication will not only contribute to the realization of park digital services that are smarter and more convenient but also ensure that they resonate harmoniously with the dynamic expectations of users, forming an integral part of their evolving urban experience.

Acknowledgments

This work was supported by the "Research on Digital Services of Physical Parks under the Influencer Economy Model", Project No: OYGJS-2021003.

References

- [1] Wang, M. (2019). Research on Digital Services and User Experience Design in Parks. *Urban Planning and Design*, (3), 45-58.
- [2] Chen, H., & Zhang, W. (2020). Influence of Park Digital Services on Urban Residents' Leisure Behavior: A Case Study of XYZ Park. *Modern Urban Research*, (2), 78-92.
- [3] Liu, J., & Li, Y. (2018). Application Research of Smart Navigation System in Urban Parks. *Information Technology and Urban Construction*, (4), 102-115.
- [4] Zhang, L., & Wang, L. (2017). Impact of Interactive Information Display Walls on

- Park Visitor Experience: A Study. *Public Services and Management*, (1), 56-68.
- [5] Li, M., & Wang, J. (2021). Study on the Impact of Park Digital Services on Residents' Physical and Mental Health. *Social Science Research*, (5), 120-135.
- [6] Zhang, X., & Wang, F. (2019). Application and Effectiveness of Smart Fitness Devices in Urban Parks. *Digital Technology and Urban Management*, (6), 88-102.
- [7] Liu, L., & Han, J. (2018). Case Study on Successful Park Digital Services—A Case Study of ABC City. *Urban Development and Management*, (2), 34-47.
- [8] Zhu, X. P., & Yang, L. (2020). Practice of Park Digital Platform Project Based on User Experience Design. *Modern Information Technology*, (4), 56-70.
- [9] Smith, J., & Johnson, A. (2020). Enhancing Park Experiences through Digital Platforms. *Journal of Urban Recreation and Digital Innovation*, 15(2), 45-60.
- [10] Turner, M., & Davis, N. (2018). Urban Parks and Smart Technologies: A Comparative Analysis of European Cities. *Journal of Urban Technology*, 16 (4), 210-225.
- [11] Doe, M., & White, S. (2020). The Impact of User Experience Design on Park Digital Services: Lessons from Cuihu Park. *Digital Urban Environments Journal*, 8 (2), 112-130