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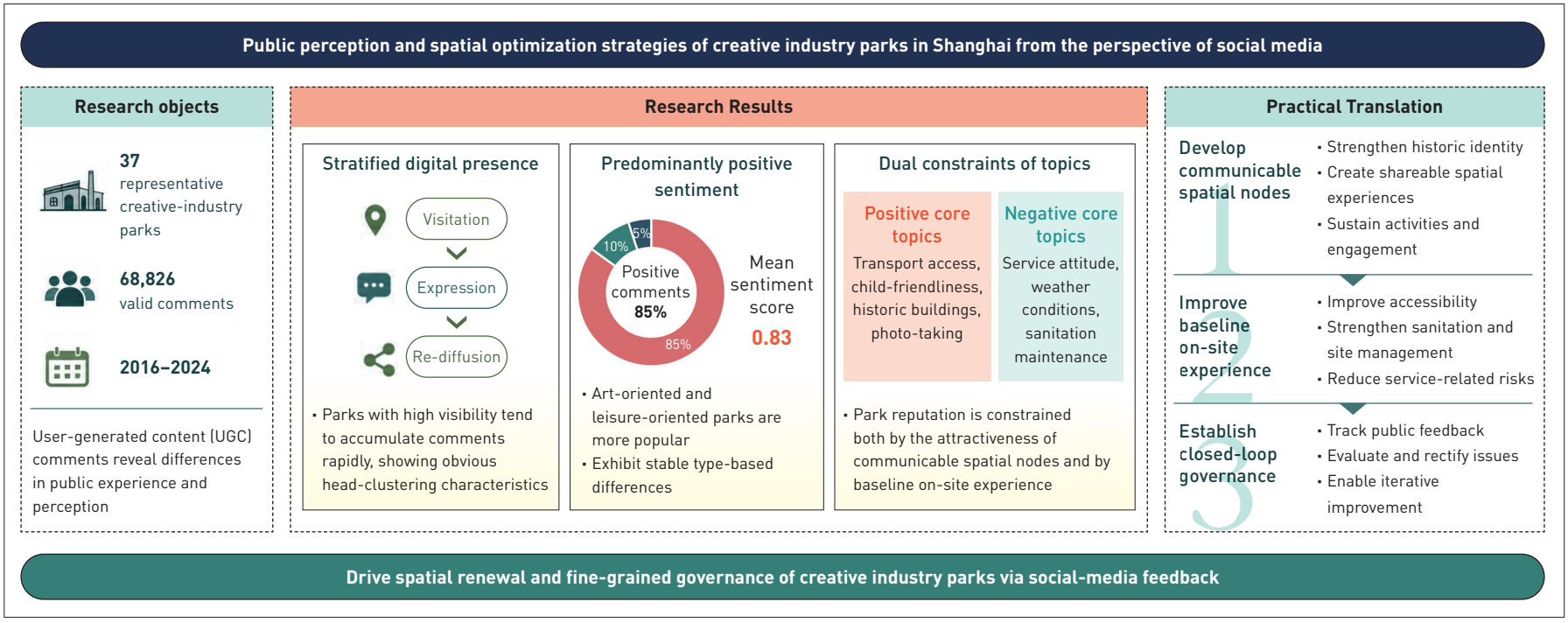
Public Perceptions and Spatial Optimization Strategies of Creative Industry Parks in Shanghai From the Perspective of Social Media

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GRAPHICAL ABSTRACT



ABSTRACT

With the rapid growth of social media, digital and physical spaces are increasingly connected. Public perceptions of creative industry parks now provide an important basis for assessing the appeal of urban spaces for cultural innovation. Previous studies have examined evaluations on social media, but few have systematically identified sentiment patterns and the issues that concern visitors most. This study examined 37 representative creative industry parks (CIPs) in Shanghai using 68,826 user comments from Dianping. It developed a quantitative framework of digital presence assessment, sentiment analysis, and topic identification. Senta was used for sentiment analysis and BERTopic for topic modeling to examine public perception across digital and physical settings. The results show that: 1) CIPs differ clearly in online visibility, and highly visible parks can accumulate reviews quickly through a cycle of visits, online comments, and further sharing; 2) public sentiment is predominantly positive, with positive comments accounting for

about 85% and a mean sentiment score of 0.83, while arts-oriented and leisure-and-entertainment CIPs exhibit higher scores; and 3) the model identified 28 topics, among which children's recreation, transportation accessibility, and historical culture occur most frequently. Convenient transportation, child-friendly environments, art exhibitions, and historical architectural characteristics constitute the core themes of positive perceptions, whereas operational issues related to management, services, and hygiene are the primary themes associated with negative evaluations. These findings show that a CIP's reputation depends on both the appeal of its online place image and the quality and consistency of the on-site experience. The study therefore proposes spatial strategies that build on positively perceived, shareable features and address recurring problems in transport connections, facilities, and services. The findings support urban regeneration and targeted governance of creative industry parks from a digital–physical perspective.

KEYWORDS

Creative Industry Park; Social Media; Public Perception; Text Mining; Digital Space Profiling; Spatial Optimization Strategy

HIGHLIGHTS

- Built a deep learning and semantic analysis framework for public perception of creative industry parks
- Introduced the virtual-physical interaction perspective to urban cultural space research
- Mined UGC to map key topics and proposed spatial design and management strategies for creative industry parks

RESEARCH FUNDS

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1 Introduction

In the context of globalization, cultural and creative industries have emerged as an important economic sector, contributing to the transformation of urban economic structures while reshaping cultural landscapes and social life[1]. For urban regeneration practices worldwide, cultural and creative spaces have become an important part for the transformation of post-industrial cities. Cities such as London, New York, Seoul, and Berlin have transformed declining industrial areas into multifunctional spaces for cultural consumption and innovation through the adaptive reuse of industrial buildings, the clustering of creative industries, and the development of cultural and consumption-oriented environments[2–6]. Creative industry parks (CIPs hereafter), often developed through the revitalization of obsolete factories, warehouses, and other underused spaces, provide physical settings for the clustering and development of creative industries while also serving as important instruments of urban regeneration, spatial reuse, and cultural innovation.

Research on CIPs extends across multiple disciplines, including Architecture[7], Geography[8], Economics[9], and Sociology[10]. Previous studies have focused primarily on functional roles[11–12], spatial morphology[13–14], evolutionary processes[15], interactions with local economies and cultures[16], and strategies for regeneration, sustainable development, and spatial vitality enhancement[17–19]. As social media becomes increasingly integrated into urban experience, however, the attractiveness of CIPs depends not only on the quality of their physical environments but also on their online visibility, capacity for content circulation, and public evaluations on digital platforms[5,20]. Platforms such as Instagram, Google Reviews, Tripadvisor, and Dianping have become important channels through which users experience, evaluate, and share information about urban cultural spaces[21–22]. Users' experiences of visiting, consumption and recreation are then translated into digital content, including comments, images, and ratings, which circulate and accumulate on platforms and, in turn, shape visitor expectations and inform CIP operations and management. Accordingly, researchers have increasingly used social media data to examine CIPs. For example, Yixin Zhang et al. used semantic analysis of social media data to identify factors associated with the popularity of CIPs[20], while Luming Cui et al. examined how social platforms contribute to the restructuring of urban creative spaces using user-generated content (UGC)[23]. More recently, advances in semantic modeling have improved the ability to identify sentiment patterns and prominent topics in large-scale textual datasets, creating new opportunities to examine the structure of public perceptions and their spatial implications[24].

However, research on CIPs both in China and internationally continues to rely largely on traditional methods, including questionnaires, field observations, and case studies, with greater emphasis on spatial form and layout than on visitors' actual experiences and perceptions. Although some studies have applied large-scale data analysis to examine patterns of spatial use in CIPs[25–26], systematic analyses of public sentiment and key concerns remain limited. To address these gaps, this study develops an analytical framework integrating online visibility assessment, sentiment analysis, and topic identification, and uses the resulting evidence to formulate spatial optimization strategies for CIPs. Focusing on selected CIPs in Shanghai, this study analyzed user-generated comments from Dianping using Senta for sentiment classification and BERTopic for unsupervised topic modeling based on Transformer embeddings. Comment count and the time elapsed since reopening were used to characterize each CIP's online visibility, while sentiment and topic structures were analyzed to examine differences in public perceptions and the relationship between online representations and reported on-site experiences. The study thereby seeks to identify visitor needs and experience-related problems more precisely, inform efforts to reduce the homogenization of CIPs, improve spatial quality and operational performance, and provide evidence-based guidance for CIP regeneration and targeted management.

2 Spatial Restructuring of CIPs From a Social Media Perspective

This research aimed to examine how social media shapes the online place images of CIPs, and how online public feedback can inform improvements to physical space.

2.1 Shaping the Digital Presence of CIPs Through Social Media

Existing studies generally regard the online place image of a CIP formed on social media as a reflection jointly constructed through user experience records, platform content aggregation, and social dissemination. Through the continuous accumulation of such data, the public forms an overall impression of spatial quality, service level, and cultural atmosphere[23,27]. During platform dissemination, algorithmic recommendation, user interaction, and social sharing further amplify online visibility, allowing CIPs to transcend the limits of geographic proximity and influence the cognitive frameworks and potential visitors' willingness[28–31]. At the research level, comment count, temporal distribution of comments, and fluctuations in attention can reflect the level of interest and dissemination intensity of CIPs on digital platforms; high-frequency elements in comment texts and images can reveal the spatial features that are repeatedly perceived and expressed by the public. However, existing research often conducts descriptive analyses and lacks in-depth characterization of the sentiment structures and topic compositions underlying online place images and their relationship with spatial governance.

2.2 Spatial Response Pathways of CIPs to Social Media

As online place images accumulate and spread on platforms, the focus of CIP governance increasingly shifts toward how to respond to online feedback and establish adjustment mechanisms. Studies indicate that the spatial response of CIPs takes a cycle of online expression, dissemination and aggregation, and offline adjustment: UGC transforms experiences into shareable evaluations, which spread through platform mechanisms and affect visitor expectations and consumption choices, thereby exerting constraints and incentives on CIP spatial design and facilities and operational governance[32–33]. Accordingly, existing studies have summarized response pathways mainly in terms of the configuration of recognizable spatial features, optimization of experience chains, and incorporation of platform evaluations into governance feedback, with particular attention to basic aspects such as transport accessibility, wayfinding organization, sanitation facilities, and service management in order to reduce the accumulation and diffusion of negative evaluations[34]. Yet specific studies often lack comparable and traceable empirical translations of these pathways, especially statistical descriptions of digital presence and its expansion, making it difficult to reveal the complete process of attention generation and differentiated evolution of parks on online social media platforms. In addition, structured identification of public feedback remains insufficient. Existing research often discusses response pathways through individual cases or small samples and rarely uses large-scale UGC to reveal the sentiment orientations and topic structures of public evaluations, hardly linking spatial elements with sentiment outcomes or providing evidence for differentiated governance.

Accordingly, this study develops a measurable framework based on social-media UGC from three dimensions: digital presence assessment, sentiment analysis, and topic identification. First, statistical indicators such as cumulative comment count and the years of operation were used to characterize the intensity of digital presence and the expansion of public attention. Next, sentiment analysis quantified the sentiment orientation and temporal fluctuations of public evaluations, while topic modeling identified the spatial elements and issue types concerned by the public.

On this basis, differences in public perceptions among CIPs were interpreted, and corresponding strategies for spatial optimization were proposed.

3 Research Methods

3.1 Study Area and Data Sources

Shanghai is one of China's leading economic and cultural centers and a global metropolis. Its CIPs have expanded rapidly and become prominent sites of innovative urban regeneration. Since the government designated its first 15 CIPs in 2009, Shanghai has developed an extensive network comprising 149 municipal-level CIPs[35].

This study employed users' comments from Dianping. Dianping is a major local-services platform in China, where users commonly post comments after visiting and consuming at physical venues. These comments provide large-scale, detailed, and temporally continuous records of user experience. The dataset includes comment text, user ID, and publication timestamps, providing the information required for quantitative sentiment and topic analysis.

To ensure sufficient textual information and reduce random variation associated with small samples, 37 of the 160 CIPs included in the *2023–2025 List of Shanghai Creative Industry Parks* were selected as the study samples by comment count (more than 200) (Fig. 1). User comments posted between January 2016 and July 2024 were collected using Python-based web scraping, yielding 69,643 raw records for subsequent analysis.

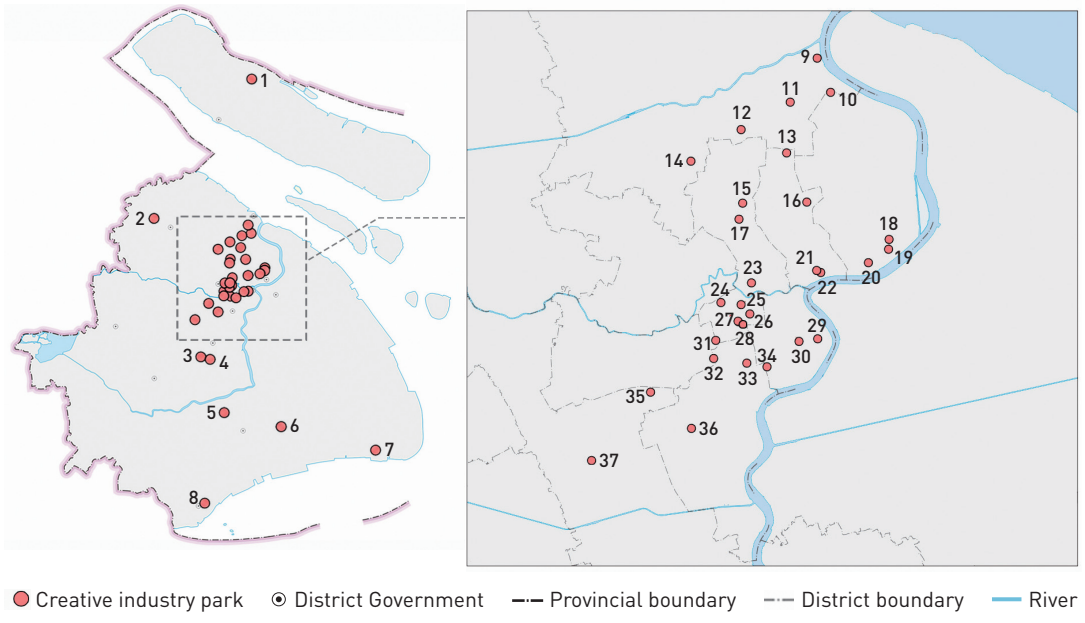
To improve the reliability of text analysis, the raw comments were systematically preprocessed. Specifically, jieba was used for Chinese word segmentation; the HIT stop-word list was applied to remove common stop words, and non-semantic elements such as whitespace, punctuation, and emojis were removed. Duplicate comments, advertisements, and entries unrelated to evaluation were also excluded. After preprocessing, 68,826 valid comments remained and were used in subsequent analyses (Table 1).

3.2 Research Framework

This study developed a quantitative framework comprising digital presence assessment, sentiment analysis, and topic identification (Fig. 2). Digital presence assessment captures a CIP's online visibility and the accumulation and circulation of comments. Sentiment analysis and topic identification measure the orientation and content of public evaluations. Together, they describe online public perception[36]. Examining the differences in public perception among CIPs can inform CIPs' online place-image management, spatial improvement, and operations.

(1) Statistical characterization of digital presence and its expansion

Cumulative comment count measures the strength of a CIP's digital presence. The number of years of operation captures the temporal development of online visibility. The analysis then compares the distribution and accumulation of comments in central

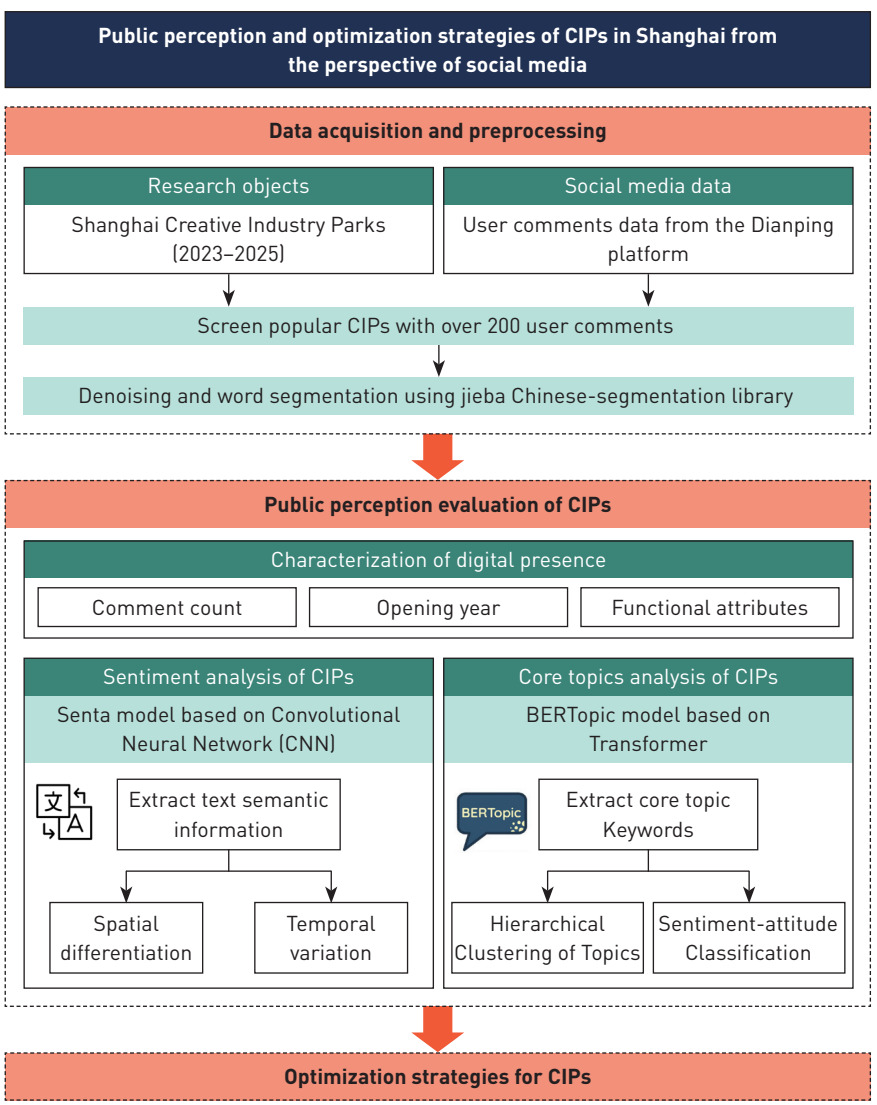


1 Jiangnan Sanmin Cultural Village
2 Xianchang Creative Park
3 Deqiu Li Xiang Valley
4 79 Art Warehouse
5 Happy Lane
6 Qingxi Old Street
7 Lingang New Industry Plaza
8 Jinshanzui Fishing Village
9 Peninsula 1919
10 Zhongcheng Wisdom Valley
11 Shanghai Museum of Glass
12 Wisdom Bay
13 Sanlinqiao Park
14 Shanghai Wood Culture Museum
15 Jing'an New Square
16 1876 Old Station
17 Daning Plaza Phase II
18 Changyang Valley
19 Forte Four Seasons
20 Shanghai Fashion Center
21 Peninsula Bay
22 1933 Old Millfun
23 M50 Creative Park
24 Chuangxiang Tower
25 Tonglefang
26 800 Show
27 98 Park
28 The Modern
29 Old Dock Space
30 Bridge 8
31 Creative Space Hongqiao
32 Columbia Circle
33 No. 8 Hengshan
34 Shangjie Loft
35 Foreigners Street
36 Crossboundaries Tianlinfang
37 Qibao Old Street Folk Base

Fig. 1 Spatial distribution of CIPs within the study area (source: Ministry of Natural Resources of China).

Table 1: Examples of UGC before and after data preprocessing

Users' comments before preprocessing	Users' comments after preprocessing
"The place is quite large, and half a day is about enough to stroll around. There are two cafés, a Chinese restaurant, and a canteen. The internet-famous café has a beautiful environment for checking in and taking photos! There is a huge movie screen where you can watch Tom and Jerry cartoons. The Yulanyuan Chinese Restaurant has a good taste and reasonable prices! The artistic information is strong, so you can stroll around and have a look. There is also the Qingshan Jinyu Jewelry Store, an American-style post office, and a medieval castle. Come and check in!"	Stroll around; half a day; café; Chinese restaurant; canteen; internet-famous; check in; taking photos; environment; beautiful; huge; movie; screen; Tom and Jerry; cartoons; Yulanyuan; taste; good; prices; reasonable; artistic; information; strong; Qingshan Jinyu; jewelry store; American-style; post office; medieval; castle
"Qibao Old Street in Minhang District is also a famous scenic spot in Shanghai and popular among local residents, not to mention nonlocal visitors who come because of its fame. Qibao Lamb is also very famous. During holidays and weekends, the crowds surge. While enjoying delicious food, you should also pay attention to hygiene and safety and wear a mask."	Minhang District; Qibao Old Street; Shanghai; famous; scenic spot; local residents; popular; fame; nonlocal; visitors; Qibao Lamb; famous; holidays; weekends; crowds; surge; enjoying; delicious food; pay attention to; hygiene; safety; mask
"I passed by on my way to work. I used to like Xingfulu and the small garden beside it because of the TV series 'Corner.' I had not been here for ten years, so it felt like revisiting an old place. The renovation is very good. I experienced this small corner, this little lane, and a kind of public welfare benefit. I stopped by for a cup of coffee, sat briefly on a stone, and made a short stop."	Passed by; on my way; work; like; Xingfulu; beside; garden; TV series; Corner; ten years; revisiting an old place; renovation; very good; experienced; corner; lane; public; welfare; benefit; coffee; stone; sat briefly; short; stop



and suburban Shanghai. Finally, CIPs are classified by function and character to support comparisons of sentiment and topic structures among CIP types.

(2) Sentiment recognition and temporal differentiation analysis

This study used the Senta model based on a CNN architecture to identify sentiment in comment texts[37]. Compared with sequential models such as LSTM, CNN is more suitable for extracting local sentiment features through multi-scale convolution and provides higher parallel-computing efficiency, thereby supporting stable processing of large-scale short texts. For each comment, the model outputs a positive-sentiment probability ranging from 0 to 1; higher scores indicate a stronger positive tendency. Following the sentiment-score classification method used in previous research[38], comments with scores of 0.6 or higher were classified as positive, those with scores of 0.4 or lower as negative, and those between 0.4 and 0.6 as neutral. Key training and hyperparameter settings included convolution-window sizes of 2, 3, and 4; max pooling in the pooling layer; a dropout rate of 0.5 in the fully connected layer; batch-gradient-descent training with a batch size of 32; an initial learning rate of 5e-5 with decay across epochs; and a 7:2:1 split of the data into training, validation, and test sets. The number of training epochs was controlled according to validation performance to mitigate overfitting. Testing showed that the Senta model achieved 89.2% classification accuracy and an F_1 score of 0.87 on

Fig. 2 Research framework.

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the study dataset, demonstrating its applicability in this research. Sentiment scores were further aggregated by time to characterize the overall sentiment orientation and temporal fluctuations of public evaluations.

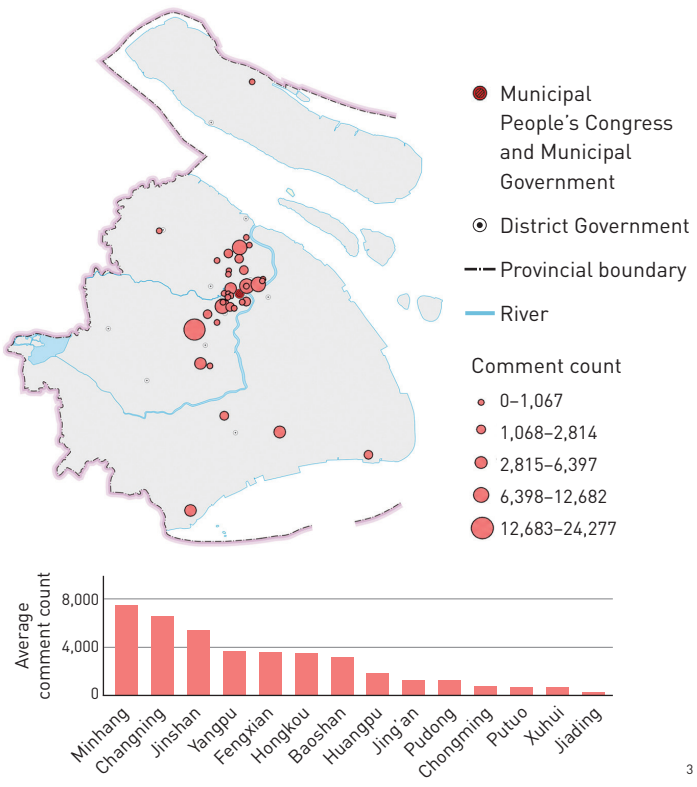
(3) Topic identification and topic-structure analysis

This study used BERTopic for unsupervised topic mining of comment texts to characterize topic structures and identify the spatial elements and issue types that attract public attention[39–41]. Compared with bag-of-words models such as LDA, BERTopic is more suitable for short-text corpora. On the one hand, UGC texts are sparse and contain abundant synonymous expressions, making topic inference based on word-frequency co-occurrence sensitive to lexical variation. On the other hand, the actual number of topics is difficult to predefine and the corpus contains noisy texts, requiring adaptive clustering and noise-recognition capabilities. BERTopic represents sentence-level semantics through Transformer-based semantic embeddings and combines density-based clustering to form topic clusters, allowing stable topics to be identified and noise to be filtered without pre-specifying the number of topics. The workflow includes semantic embedding, dimensionality reduction, clustering, and keyword extraction. First, semantic embedding vectors were generated with a pretrained Transformer language model. UMAP was then used for dimensionality reduction to preserve the main semantic structure while reducing computational complexity, followed by adaptive clustering using HDBSCAN. Finally, topic keywords were extracted using class-based weighting and the topics were named accordingly. Key parameters were an embedding dimension of 384, a post-UMAP dimension of 15, a minimum cluster size of 10, and a c-TF-IDF weighting coefficient of $\alpha = 0.75$. The model outputs were manually reviewed to ensure semantic coherence and interpretability, and a hierarchical diagram was used to visualize topic distributions and interrelationships. Following the overall topic analysis, positive and negative comments were modeled separately with BERTopic as two independent corpora. The resulting topic structures and representative keywords were compared to identify the dominant themes associated with each sentiment category and to examine their corresponding experiential and spatial implications.

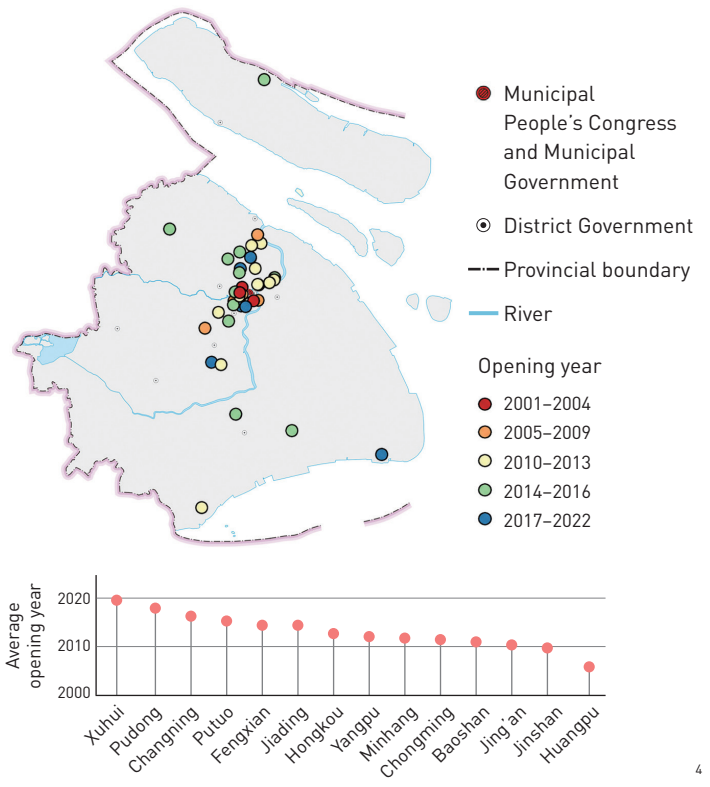
4 Research Results

4.1 Statistical Characterization of Digital Presence and Its Expansion

Regarding digital presence, the comment counts of the selected CIPs showed a pronounced hierarchical distribution (Fig. 3). Qibao Old Street Folk Base ranked first with 24,277 comments, followed by Columbia Circle, 1933 Old Millfun, Shanghai Museum of Glass, and Shanghai Fashion Center. At the same time, digital presence does not increase linearly over time but is associated with stages of spatial regeneration (Fig. 4). The regeneration of the selected



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Fig. 3 Distribution of CIPs within the study area by comment count (source: Ministry of Natural Resources).

Fig. 4 Distribution of CIPs within the study area by opening year (source: Ministry of Natural Resources).

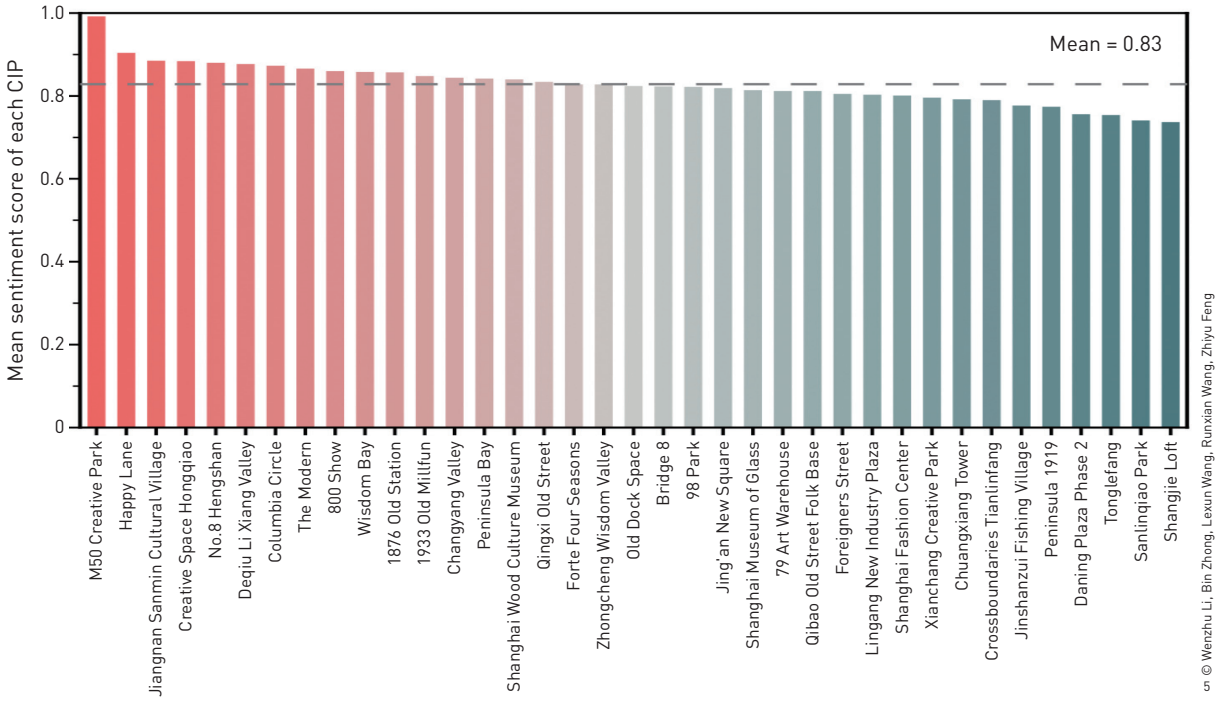
CIPs was concentrated mainly between 2010 and 2016. Notably, although Columbia Circle opened at the end of 2016, its comment count already ranked third, suggesting that highly visible CIPs can accumulate comments rapidly over a short period through a reinforcing sequence of visits, comments, and sharing.

Spatially, the selected CIPs are concentrated in central Shanghai, with comparatively few located in suburban areas. Beyond differences in location and accessibility, this concentration may also be associated with the greater intensity of everyday activities, consumption opportunities, and social media use in central areas, which can facilitate more frequent and sustained comment accumulation. To examine differences in public perceptions across CIPs with different functions, the 37 CIPs were classified into five types: industry-focused, arts-oriented, leisure-and-entertainment, local heritage and culture, and mixed-use. Industry-focused CIPs primarily accommodate enterprises and industry-related services (e.g., Zhongcheng Wisdom Valley); arts-oriented CIPs emphasize artistic production and exhibition, often through the adaptive reuse of former factories and warehouses (e.g., M50 Creative Park, Columbia Circle); leisure-and-entertainment CIPs prioritize consumption and recreational experiences (e.g., Bridge 8, 800 Show, and The Modern); local heritage and culture CIPs emphasize historic character and local traditions (e.g., Jinshanzui Fishing Village, Qibao Old Street Folk Base, Qingxi Old Street); and mixed-use CIPs integrate industry services, leisure and entertainment, heritage features, and other functions (e.g., 1933 Old Millfun, Deqiu Li Xiang Valley).

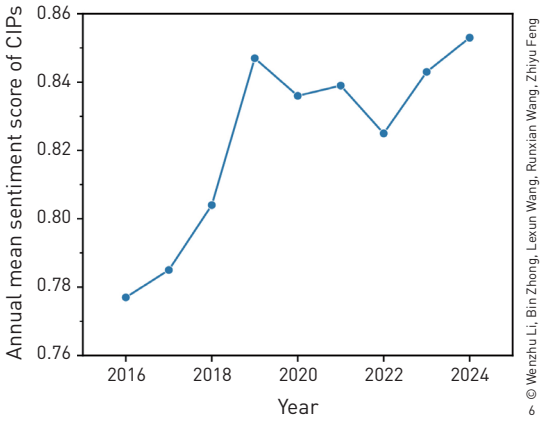
4.2 Sentiment Analysis of CIPs

The overall mean sentiment score of the sampled CIPs was 0.83. As shown in Fig. 5, the mean score of each CIP was above 0.7, indicating that public evaluations of Shanghai's CIPs were generally positive. There were 58,625 positive comments, accounting for 85% of the total; negative comments accounted for 10%, and neutral comments for 5%. Among the CIPs, M50 Creative Park and Happy Lane both had a mean sentiment score above 0.9, indicating relatively high levels. The higher-scoring CIPs were concentrated on the arts-oriented and leisure-and-entertainment ones, which often feature distinctive artistic characteristics, a leisure atmosphere, and strong visual identities, making them more likely to receive positive public evaluations.

Annual mean sentiment scores of all the studied CIPs increased from 2016 to 2019, declined substantially from 2020 to 2022, and gradually recovered after 2023 (Fig. 6). Before the COVID-19 pandemic, public evaluations improved steadily, suggesting that policy support and continued regeneration were associated with favorable assessments of spatial quality and operations. The decline during the pandemic might be mainly due to the reduced visitor activity, operating restrictions, and poorer public-service experiences. Scores recovered as in-person activities and operations resumed, possibly because of re-dynamics, improved facilities and services, and enhanced management.



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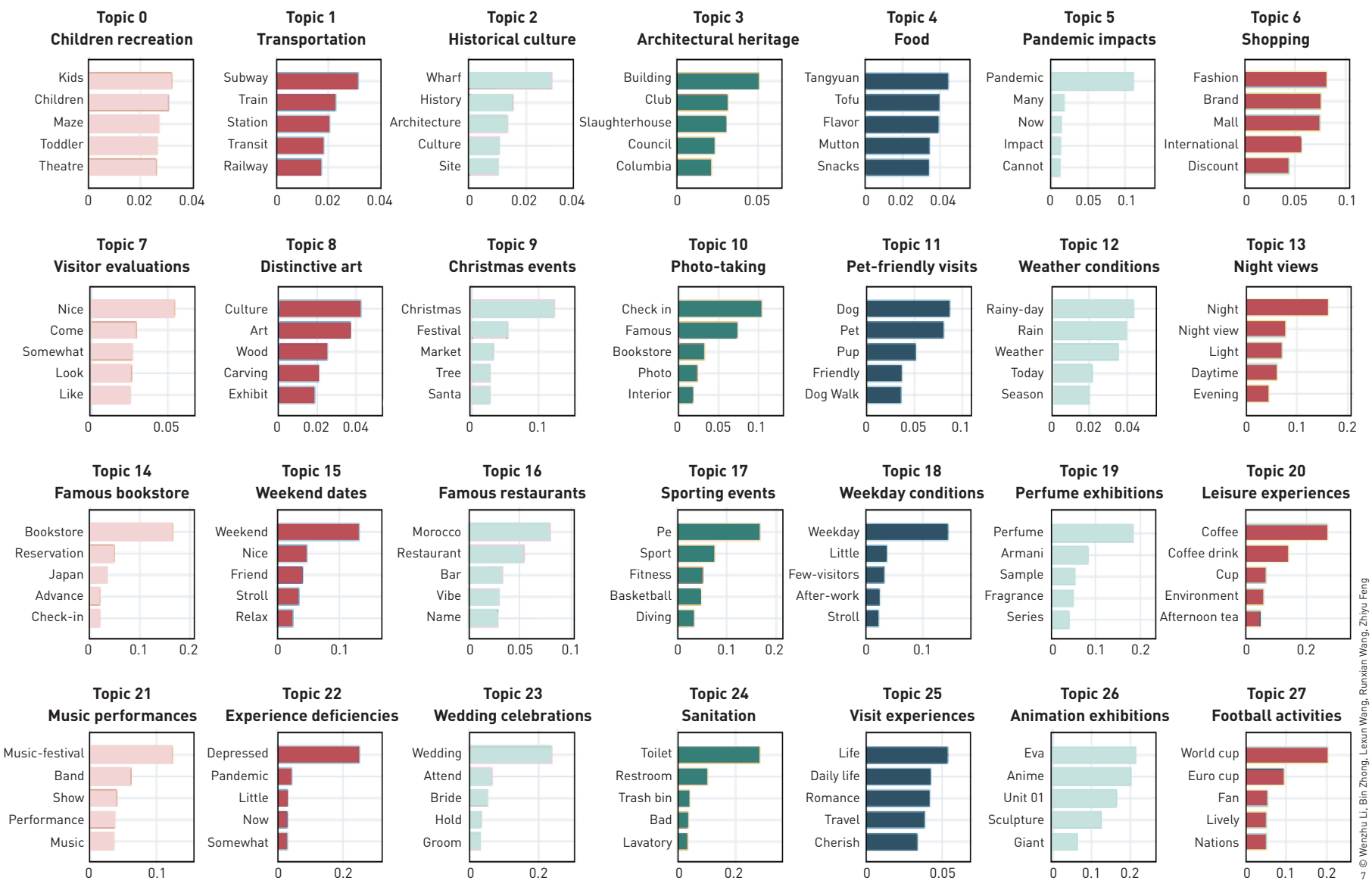
Fig. 5 Mean sentiment score of each CIP.
Fig. 6 Annual mean sentiment scores of all the studied CIPs.

4.3 Core Topics Analysis of CIPs

Based on the BERTopic model, 28 topics were identified from the comment texts and ranked by frequency (Fig. 7). The most frequent topics centered on everyday experiences, including child-friendly activities, transportation, historic buildings, dining, and shopping. The topics formed distinct clusters in semantic space, reflecting differences in the content of public discussions. Children recreation (Topic 0) was the largest cluster, suggesting that family leisure and parent–child experiences constitute a major focus of public discussion. Transportation (Topic 1) also received substantial attention, underscoring the importance of accessibility in public evaluations. Historical culture (Topic 2) and architectural heritage (Topic 3) both related closely to historic buildings, suggesting that architectural character and adaptive reuse are important components of how the public perceive and recognize CIPs. In addition, weekend dates (Topic 15) and weekday conditions (Topic 18) captured differences between weekend leisure and weekday visitation, revealing a distinct temporal pattern in park use. Topics related to social-media-popular restaurants, music performances, wedding celebrations, and animation exhibitions highlighted the diversity of park attractions and the importance of event-based experiences. At the same time, some topics pointed directly to deficiencies in infrastructure and visitor experience, suggesting that public services and operational management also play an important role in shaping overall perceptions.

Based on semantic similarity, the 28 topics were further organized into three thematic clusters: cultural and sports activities, leisure and daily life, and history and culture. This grouping

Fig. 7 Topic keywords among the comments: vertical axis shows the top five keywords for each topic, and horizontal axis indicates the weight of each keyword within that topic.



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revealed the semantic relationships and hierarchical structure of public comment content (Fig. 8). The cultural and sports activities cluster encompasses exhibitions, performances, celebrations, and sporting events; the leisure and everyday life cluster includes dining, photography and social media check-ins, nighttime scenery, and visits at different times; and the history and culture cluster centers on historic buildings, architectural heritage, and distinctive artistic features, while also incorporating practical aspects of the visitor experience such as transportation, recreation, and shopping.

4.4 Core Topics Analysis of Positive and Negative Comments

Positive and negative comments were modeled separately, revealing distinct differences in their thematic distributions (Fig. 9). Sentiment is primarily associated with three dimensions of the visitor experience: transport accessibility, attractive spatial features (e.g., historic buildings, art exhibitions), and the quality of public facilities (e.g., sanitation, service, park and crowd management). Positive comments center on accessibility, children recreation, art exhibitions, photography and social media check-ins, and historic landmarks. Favorable evaluations were more commonly associated with the combination of convenient access, distinctive spatial features, and engaging activity programming. By contrast, negative comments were dominated by expressions of disappointment and often compare current conditions with earlier experiences, indicating a perceived decline in visitor experience. These comments mainly concerned poor service attitudes, adverse weather conditions, and inadequate sanitation facilities.

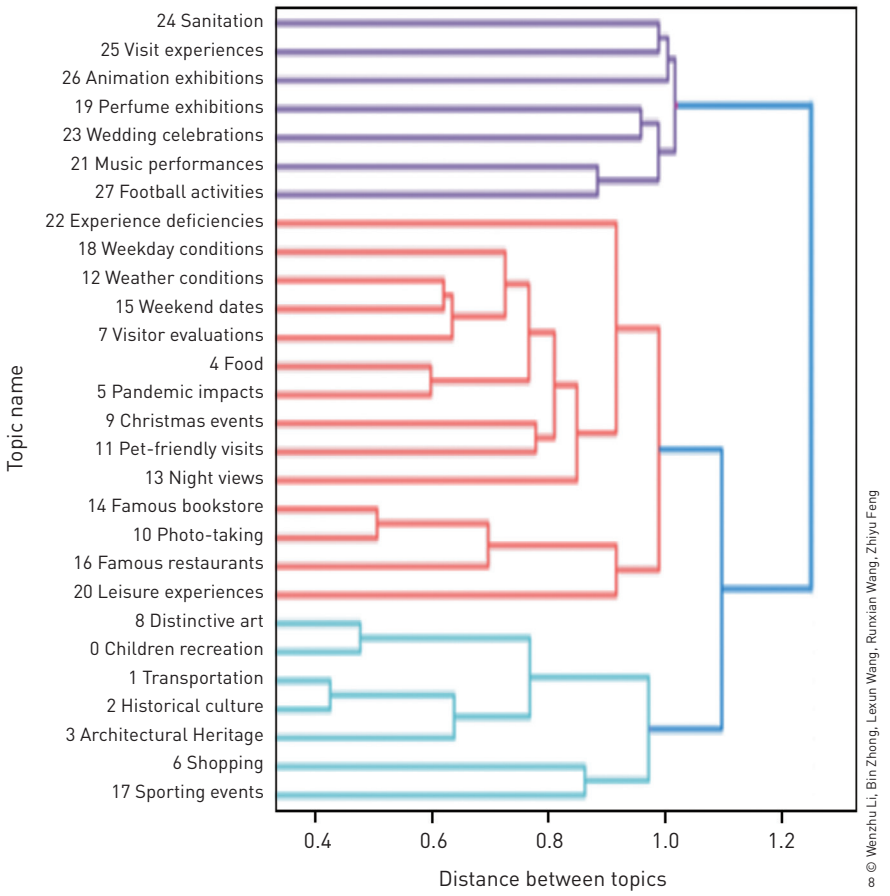


Fig. 8 Hierarchical structure of topics among the comments: different colors represent different topic clusters identified by hierarchical clustering. The purple cluster represents the theme group of cultural and sports activities, the red cluster represents the theme group of leisure and daily life, and the blue cluster represents the theme group of historical and cultural resources. Horizontal axis indicates the distance between topics—smaller distances indicate higher topic similarity.

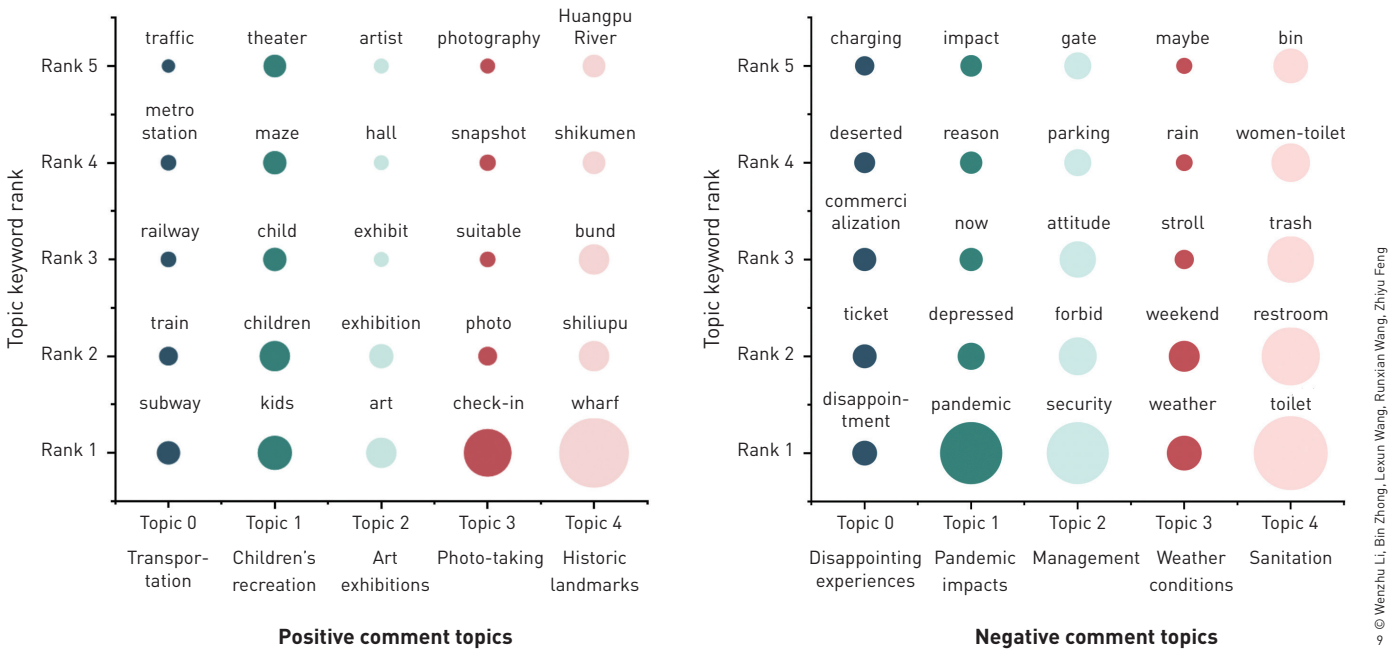


Fig. 9 Top 5 high-frequency topics and representative keywords in positive and negative comments: horizontal axis shows the five most frequent topics in positive or negative comments, and vertical axis shows the five most frequent keywords within each topic—larger dots indicate higher keyword frequencies in the topic.

The comparison suggests that spatial features with high potential for social media sharing, such as historic buildings, art exhibitions, and visually distinctive locations, are more likely to generate UGC and circulate online, contributing to positive perceptions. By contrast, basic service and management conditions, including sanitation facilities, service quality, and site management, may attract less attention in routine social media sharing. However, when deficiencies occur, they are more likely to appear collectively in negative comments and adversely affect overall perceptions of the CIP. Therefore, differences in public perception reflect not only variations in location and type but also the interaction between internal spatial provision, management quality, and the ways these characteristics are represented and circulated through social media.

5 Discussion

5.1 Mechanisms Underlying Spatial Differences of Public Perception

The research findings revealed that differences in public evaluations of CIPs cannot be attributed to CIP type or location alone; rather, they emerge through interactions between social media and visitors' experiences of the physical space. Visitors selectively document spatial features and experiences through UGC, while platform recommendations and information flows shape the visibility and circulation of the content. The resulting digital presence of the CIP may shape potential visitors' expectations and visitation decisions and is subsequently reinforced, modified, or challenged through later visits and newly generated content. These differences of public perception can be understood through three interrelated processes: the production and circulation of digital place representations, the role of basic service thresholds, and the uneven distribution of online attention and repeated representation of place.

First, visually distinctive and narratively engaging spatial features facilitate the production and circulation of digital place representations. On social media, these features can be readily communicated through photographs, narratives, and other UGC forms. This may help explain why arts-oriented CIPs and some leisure-and-entertainment CIPs received relatively favorable evaluations. Their distinctive settings can be documented, shared, and recirculated, allowing individual experiences to contribute to broader public expectations. Spatial design and activity programming therefore contribute to both on-site experience and the CIP's digital presence, potentially reinforcing a cycle of visits, comments, and subsequent sharing.

Second, basic services establish a minimum threshold for a satisfactory visitor experience. Transport accessibility, sanitation facilities, service quality, and crowd management may receive limited attention when they meet expectations, whereas deficiencies in these areas are more likely to be highlighted in negative comments. When operational or maintenance problems persist, visitors may perceive them as evidence of broader deterioration in park quality rather than as isolated shortcomings. Positive online attention is therefore more closely associated with shareable spatial features, whereas negative evaluations are often linked to deficiencies in basic services and management.

Third, digital platforms reshape the distribution of attention and contribute to the repeated representation of place. A CIP's digital presence is not determined solely by geographic proximity. The circulation, aggregation, and recommendation of UGC can extend the visibility of some CIPs beyond their immediate surroundings and may translate online attention into physical visits. Highly visible CIPs may attract more visitors and generate additional UGC, further strengthening their digital presence. CIPs with lower visibility or a less distinctive identity may be less likely to benefit from this cumulative process. Central-city CIPs may gain cumulative advantages from higher levels of activity, consumption, and social media use, whereas suburban CIPs may receive less online attention and less favorable evaluations when they lack a distinctive identity or adequate basic services. CIPs therefore derive their attractiveness from the combined quality of their physical environments, digital presence, and capacity to meet visitor needs.

5.2 Spatial Optimization Strategies for CIPs From a Public-Perception Perspective

Based on the sentiment and topic analysis of Dianping UGC, this study proposes the following spatial strategies and practical measures for CIPs in Shanghai.

First, spatial investment should prioritize high-frequency positive topics and reinforce distinctive place characteristics. Historic buildings, art exhibitions, photography, and social media check-ins were prominent in positive comments, while arts-oriented and leisure-and-entertainment CIPs generally achieved higher sentiment scores. Regeneration projects should therefore emphasize historic architecture, exhibition spaces, and landmark public spaces along major frontages and circulation routes. Careful design of lighting, materials, and sightlines can enhance visual legibility and photographic appeal, while architecture, exhibitions, activities, and rest areas should be integrated along continuous and

legible visitor routes. Recurring programs, including exhibition seasons, themed markets, and evening openings, can sustain visitor interest and reduce reliance on isolated landmarks that may generate short-term attention but contribute little to long-term spatial distinctiveness.

Second, high-frequency negative topics should be used to identify minimum service and spatial standards for a reliable visitor experience. Complaints about sanitation, service, and crowding suggest that deficiencies in basic services and management are closely associated with negative overall evaluations. Priority measures include improved entrance legibility and wayfinding, stronger last-mile transport connections, and more effective crowd management during peak periods. CIPs should also ensure adequate sanitation facilities at key locations, monitor the spatial distribution of complaints, and evaluate the effectiveness of corrective actions. Standardized service procedures, capacity controls, queue management, segregated circulation where necessary, and emergency-response plans can further reduce variability in visitor experience and limit the recurrence of negative evaluations.

Finally, CIPs should establish a regular evaluation and feedback cycle linking spatial regeneration with day-to-day operations. Monthly mean sentiment scores and the proportion of negative comments can serve as monitoring indicators, while recurring negative topics can help identify specific operational or spatial problems. A park-level dashboard can track identified problems, corresponding corrective actions, and subsequent changes in public feedback. The persistence and diversity of positive topics can inform assessments of cultural and activity programming, while declines in recurring negative themes can be incorporated into operational performance evaluation. This process links changes in digital public perceptions to specific management responses and supports the continuous improvement of spatial quality and service provision[42].

5.3 Strengths and Limitations

By analyzing a large UGC dataset, this study broadened the empirical coverage of public perceptions and identified fine-grained patterns in visitor evaluations. It developed an analytical framework that integrates sentiment analysis and topic modeling, complementing questionnaire- and interview-based approaches that are often constrained by sample size, temporal coverage, and self-reporting bias. The framework also enabled the examination of temporal variation in public perceptions and sentiment. By linking digital presence of place with reported experiences of physical space, the study provides insight into how social media and on-site experience interact in shaping perceptions of urban cultural spaces, and offers a replicable approach to analyzing public perceptions and an evidence base that can inform the spatial planning and management of CIPs.

This study also has several limitations that should be considered when interpreting the findings. Dianping comments are more likely to be generated by young and middle-aged users and consumption-oriented visitors, potentially underrepresenting nearby residents, employees, and visitors who do not engage in consumption activities. The platform's rating categories and tags may encourage users to comment more explicitly on transport, service, and sanitation, while less tangible dimensions of place, such as local memory, cultural narratives, and social networks, may be less visible in the comment data. Reliance on a single platform also limits the ability to compare how digital presence circulates across platforms and how online attention is associated with subsequent visitation. Future research should integrate data from multiple platforms to assess platform-specific biases and combine social media data with questionnaires and in-depth interviews to capture sociodemographic characteristics and visit motivations[43]. Such an approach would strengthen the interpretation of public perceptions and provide a more comprehensive understanding of how interactions between digital media and physical space can inform spatial planning and management.

6 Conclusions

Social media has extended public perception of CIPs from on-site experience to online expression. UGC now provides an important link between urban cultural spaces and public sentiment. Using Dianping comments of 37 representative CIPs in Shanghai, this study develops a framework of digital presence assessment, sentiment analysis, and topic identification. It combines CNN-based Senta sentiment analysis with Transformer-based BERTopic topic modeling to identify sentiment patterns and topic structures and to propose strategies for spatial regeneration and park management. The main findings are as follows:

1) CIPs show clear differences in digital presence. Central-city CIPs generally accumulated more comments and achieved greater platform visibility. However, some recently opened CIPs also attracted substantial online attention. These patterns suggest that UGC circulation can extend a CIP's visibility beyond geographically proximate audiences.

2) Public sentiment is predominantly positive, with clear differences across CIP types. Approximately 85% of comments

were classified as positive, with arts-oriented and leisure-and-entertainment CIPs exhibiting relatively higher sentiment scores. Positive evaluations were more closely associated with spaces that support participation, extended stays, and social media sharing. The findings further suggest a reinforcing sequence of "visit, comment, and sharing" may contribute to the accumulation of positive online attention.

3) The topic analysis revealed a multidimensional structure in which both distinctive spatial attractions and basic service conditions are associated with public perceptions of the CIP. Children recreation, transport accessibility, and historic buildings are among the most frequently discussed topics. Historic architectural character, art exhibitions, photography, and social media check-ins are prominent topics in positive comments, whereas sanitation, service quality, and crowd management are more prevalent in negative comments. CIP reputation therefore reflects both the appeal of shareable spatial features and the reliability of basic services and management.

Based on these findings, this study proposed an evidence-based approach to spatial optimization strategies. High-frequency positive topics can guide investment in distinctive and shareable spatial features, including historic architecture, exhibition spaces, and recurring cultural events, thereby reinforcing spatial identity and place character. Recurring negative topics can help identify priorities for improving transport connectivity, sanitation facilities, service quality, and crowd management. UGC-based sentiment and topic indicators can also support a continuous monitoring and feedback cycle linking spatial regeneration with CIP operations and public evaluation. Together, these measures provide a data-informed basis for the adaptive regeneration and management of CIPs.

Competing interests | The authors declare that they have no competing interests.

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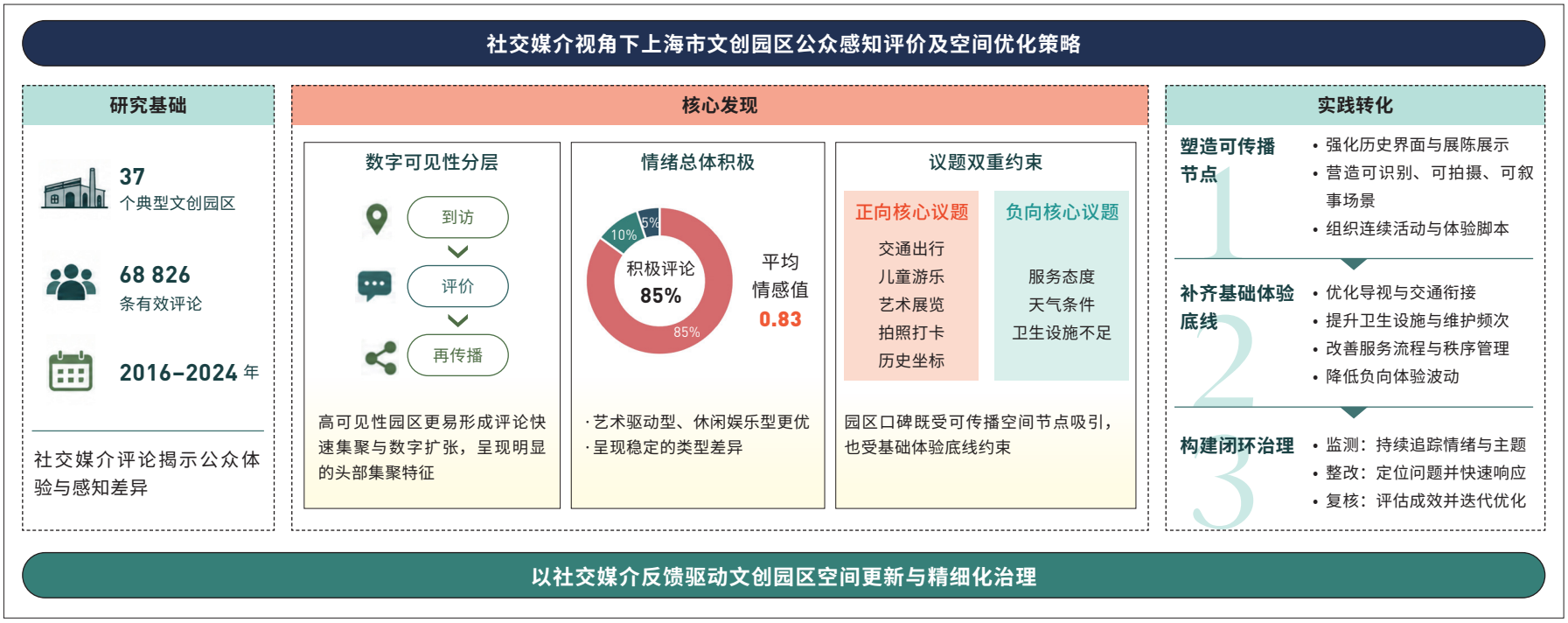
社交媒介视角下上海市文创园区公众感知评价及空间优化策略

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图文摘要



摘要

随着社交媒介的快速发展，实体空间与虚拟空间日益融合，公众对文创园区的感知逐渐成为衡量城市文化创新空间吸引力的重要依据。既有研究虽已关注社交媒介评价，但对情感倾向与核心关注要素的系统提炼仍相对不足。本文以上海市37个典型文创园区为研究对象，采集大众点评平台68 826条用户评论数据，构建“数字空间刻画－情绪感知－主题识别”的量化框架，综合采用Senta进行情绪识别与BERTopic进行主题建模，以揭示虚实互动情境下的公众感知机制。研究发现：1）园区数字空间存在呈显著分层，高可见性园区可在较短周期内实现评价快速集聚，并形成到访、表达、再传播的扩张链条；2）公众评价整体偏积极，积极评论约85%，情感均值0.83，且艺术驱动型与休闲娱乐型园区得分较高，呈现稳定的类型差异；3）主题建模共提炼了28个主题，其中儿童游乐、交通出行与历史文化等日常体验要素为高频主题，交通便捷、儿童友好、艺术展览与历史建筑风貌构成正向主题核心，管理、服务、卫生等运营问题则集中对应负向评价，表明园区口碑同时受数字形象吸引力与实体空间体验性双重约束。随后，本文进一步提出面向实体空间响应的优化策略，以高频正向主题锚定可传播空间节点与活动供给，以高频负向主题校准交通衔接与设施服务底线，为虚实空间互动视角下的城市文创园区更新实践提供方法路径与策略参考。

关键词

文创园区；社交媒介；公众感知；文本挖掘；数字空间刻画；空间优化策略

文章亮点

- 构建融合深度学习与语义分析的文创园区公众感知分析框架
- 引入虚实空间互动视角，拓展城市文化空间研究维度
- 基于UGC数据挖掘公众关注主题，提出文创园区运营优化策略

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1 引言

文化创意产业作为全球化背景下的新兴产业典范[1]，推动了城市经济结构的优化升级，重塑了城市文化景观与社会风貌。在国际城市更新实践中，文化创意空间已成为后工业城市转型的重要载体。伦敦、纽约、首尔、柏林等城市均通过旧工业建筑再利用、创意产业集聚和文化消费场景营造，推动衰退工业区向复合型文化消费与创新空间转变[2-6]。由老旧厂房、仓储空间等更新而来的文化创意产业园区（以下简称“文创园区”），既是文创产业集聚发展的物质载体，也是推动城市更新、空间再利用与文化创新的重要抓手。

文创园区的相关研究涉及建筑学[7]、地理学[8]、经济学[9]、社会学[10]等多个领域。既有成果主要从功能定位[11-12]、空间形态[13-14]、演变历程[15]，以及其与地方经济文化的互动关系[16]，园区更新、可持续发展与空间活力提升的策略路径[17-19]等方面展开讨论。随着社交媒介深度介入城市体验，文创园区的吸引力不仅由实体空间品质决定，还受到数字平台可见性、内容传播能力、公众口碑评价等因素的共同影响[5,20]。Instagram、Google Reviews、Tripadvisor、大众点评等平台已成为公众感知、评价和传播城市文化空间的重要媒介[21-22]。公众的线下到访、消费与游憩体验被转化为在线评论、图像和评分等数字内容，并在平台中持续传播和累积，进而影响潜在游客的到访预期与园区运营管理。已有研究开始将社交媒介数据应用于文创园区研究，例如，张译心等通过社交媒体语义分析揭示文创园区人气的影响机制[20]；崔璐明等基于用户生成内容（User-Generated Content，UGC）探讨社交平台对城市文创空间重构的作用[23]。同时，深度语义模型的发展提升了大规模文本中情绪倾向和主题关注要素的识别能力，为揭示公众感知结构及其空间指向提供了方法支撑[24]。

然而，国内外关于文创园区的研究仍多沿用传统分析方法，如问卷调查、实地观察与案例分析等，主要聚焦于空间形态与布局特征，较少关注公众在游憩过程中的真实情感体验。尽管部分研究尝试借助大数据手段探讨文创园区的空间使用问题[25-26]，但在公众情绪倾向及其核心关注要素的系统识别与提炼方面仍显不足。针对上述问题，本研究旨在构建面向文创园区的“数字空间刻画-情绪感知-主题识别”分析框架，并据此提出可操作的空间优化策略。以上海市热门文创园区为研究对象，综合采用基于深度卷积神经网络（CNN）的Senta情绪识别模型与基于Transformer语义嵌入的BERTopic无监督主题建模方法，对大众点评平台UGC评论进行系统采集与处理：一方面，以评论规模与更新开放时段等指标刻画文创园区在平台中的数字空间存在；另一方面，量化公众情绪取向并识别其关注主题结构，从而揭示不同文创园区数字形象形成及其与线下体验反馈之间的互动机制。研究旨在基于社交媒介数据更精准地识别公众需求与体验痛点，为缓解文创园区同质化、提升空间品质与运营效能提供理论支撑，并为更新改造实践与精细化治理提供数据依据。

2 社交媒介视角下文创园区的空间重塑

本文从两个方面对相关研究进行梳理——社交媒介对文创园区数字形象的塑造，以及线上公众反馈对实体空间优化的响应路径。

2.1 社交媒介对文创园区的数字形象塑造

既有研究普遍认为，文创园区在社交媒介上形成的数字形象由用户体验记录、平台内容聚合与社交传播共同构成。通过这些数据的持续叠加，公众对文创园区空间品质、服务水平和文化氛围的综合印象得以形成[23,27]。在平台传播过程中，算法推荐、用户互动和社交转发进一步放大了文创园区的可见性，使其突破地理邻近性的限制，影响潜在游客的认知框架与到访意愿[28-31]。在研究层面，评论数量、评论时间分布和热点波动可反映文创园区在数字平台中的关注度与传播强度；评论文本和图片内容中的高频要素则可揭示文创园区中那些被公众反复感知和表达的空间特征。但已有研究多停留在描述性分析层面，对数字形象背后的情绪结构、主题构成及其与空间治理之间的关系仍缺乏深层刻画。

2.2 文创园区对社交媒介的空间响应路径

随着数字形象在平台中累积并扩散，文创园区治理的关注点进一步转向如何响应线上反馈并形成调整机制。相关研究指出，文创园区的空间响应体现为线上表达、传播聚合、线下调整的循环过程：UGC将体验转化为可传播的评价信号，信号在平台机制中扩散并影响到访预期与消费选择，从而对园区空间供给与运营治理产生约束与激励[32-33]。基于此，既有研究多从空间要素的标签化配置、体验链条的优化，以及将平

台评价纳入治理反馈等方面概括园区的响应路径，重点指向交通可达、导视组织、卫生设施与服务管理等基础环节，以降低负向评价的累积与扩散[34]。但在具体研究中往往缺少将其转译为可比较、可追踪的实证研究，尤其是对数字空间存在与扩张的统计刻画不足，难以揭示各园区在网络平台中关注度形成与差异化演化的完整过程。其次，对公众反馈的结构化识别不足。既有研究多以个案描述或小样本数据讨论响应路径，较少基于大规模UGC揭示公众评价的情绪取向与主题结构，从而难以回答何种空间要素与何种情绪结果相对应，也难以为差异化治理提供证据支撑。

基于此，本文以社交媒介UGC为数据基础，从“数字空间刻画–情绪感知–主题识别”3个层面构建可测度框架：首先以累计评论量、开放运营年限等统计指标刻画文创园区在网络平台中的数字空间存在强度及其关注度的扩张；继而以情绪分析量化公众评价的情感取向与波动特征，以主题建模识别公众关注的空间要素与问题类型；在此基础上解释文创园区间公众感知差异，并提出面向文创园区空间优化的策略指向。

3 研究方法

3.1 研究区域与研究数据

上海市作为中国乃至全球的重要经济、文化枢纽，在文创园区的建设和发展方面具有显著的活力和创新性。自2009年上海首批认定15家市级文化产业园区以来，历经十余年发展，上海已形成以149家市级文化创意产业园区为主体的文创载体体系[35]。

本研究使用大众点评平台的用户评论数据作为数据来源。大众点评主要服务于本地生活消费场景，评论内容以到访后的消费与体验反馈为主，具有高频、细粒度与时序连续等特征。数据字段包括评论文本、用户唯一标识符（ID）与发布时间戳，可支持对公众评价的情绪与主题进行量化分析。

基于《2023—2025年度上海市文创园名单》，为保证样本具有较充分的评价信息以降低小样本园区带来的偶然性影响，本研究以平台评论量为筛选依据：在名单所列160家园区中选取评论数超过200条的园区，最终确定37家文创园区作为研究样本（图1）。随后，采用Python爬虫技术收集上述园区在2016年1月至2024年7月期间的用户评论信息，共获得69 643条记录，为后续分析提供数据基础。

随后，为提高文本分析的准确性与有效性，本文对原始评论数据进行预处理。具体包括：使用jieba进行中文分词与去噪处理；结合哈工大停用词表过滤常见停用词；清除空格、标点与表情符号等非语义信息；剔除重复评论、广告信息及与园区评价无直接关联的文本条目。经清洗后，最终得到68 826条有效评论用于后续分析（表1）。

3.2 研究框架

本研究构建了“数字空间刻画–情绪感知–主题识别”可测度框架（图2）。其中，数字空间刻画主要表征文创园区在网络平台中的可见度、评价信息的积累和扩张；情绪感知与主题识别则分别反映公众评价的情感倾向和关注主题，共同构成公众网络感知的核心维度[36]。综合分析不同文创园区公众感知的差异及其特征，可为文创园区的数字形象塑造、空间优化与运营管理提供依据。

（1）数字空间存在及其扩张特征的统计刻画

首先，以园区在平台上的累计评论数量衡量其数字空间存在强度。其次，统计文创园区开放运营年限，以呈现其数字空间扩张的时间特征。再次，结合园区的物理空间分布，比较中心城区与郊区园区在样本

表 1：数据预处理前后对比示例

预处理前的用户评论	预处理后的用户评论
“里面还挺大的，逛逛半天差不多够了。里面有两家咖啡厅，一家中餐厅，一个食堂，网红咖啡厅打卡拍照环境挺漂亮的！有超大电影屏幕可以看猫和老鼠动画片。玉兰苑中餐厅口感不错，价位合理！艺术信息浓厚，逛逛看看，还有一个青山金玉珠宝店，美式邮局和中世纪古堡，快来打卡吧！”	逛逛；半天；咖啡厅；中餐厅；食堂；网红；打卡；拍照；环境；漂亮；超大；电影；屏幕；猫和老鼠；动画片；玉兰苑；口感；不错；价位；合理；艺术；信息；浓厚；青山金玉；珠宝店；美式；邮局；中世纪；古堡
“闵行区七宝老街也算是上海有名的景区了，本地人都喜欢来，更不要说是闻名而来的外地游客。七宝羊肉那是相当有名气的节假日周末的时候人潮传动，现在非常时期还是要带好口罩，在享受美食的时候也要注意卫生安全。”	闵行区；七宝老街；上海；有名；景区；本地人；喜欢；闻名；外地；游客；七宝羊肉；名气；节假日；周末；人潮；涌动；口罩；享受；美食；注意；卫生；安全
“去上班的路上途径这里，以前因为电视剧《转角》喜欢上幸福路和旁边的小花园，有十年没经过这里，‘故地重游’改建得很好，感受到这么一个小角落，一个小里弄，一种公益福利，路过来一杯咖灰，石头上小坐，短暂的停留。”	上班；路上；途经；电视剧；转角；喜欢；幸福路；旁边；花园；十年；故地重游；改建；很好；感受；角落；里弄；公益；福利；咖啡；石头；小坐；短暂；停留

分布和评论积累方面的差异。在此基础上，依据园区功能与性质进行类型划分，为后续不同类型园区的情绪感知与主题结构比较提供基础。

（2）情绪识别与时序分异分析

研究采用基于CNN架构的Senta模型对评论文本进行情绪识别[37]。相比LSTM等序列模型，CNN更适于通过多尺度卷积提取局部情绪特征，并具备较高的并行计算效率，从而满足大规模短文本的稳定处理需求。模型对每条评论输出积极情绪概率，取值范围为0~1，得分越高表示评论的积极情绪倾向越强。参考既有研究的情感得分划分方法[38]，将得分不低于0.6的评论判定为积极，得分不高于0.4的评论判定为消极，得分介于0.4和0.6之间的评论判定为中立。本研究关键训练与超参数设置包括：卷积窗口尺寸分别设为2、3和4，池化层采用最大池化，全连接层随机失活率设为0.5；训练采用批量梯度下降，批量大小为32，初始学习率为5e-5并随轮次衰减；数据按7:2:1划分训练集、验证集与测试集，并依据验证集表现控制训练轮次以缓解过拟合。经测试，Senta模型在本研究数据集上的情感分类准确率达89.2%，F_1值为0.87，证明了该模型在本研究语境下的适用性。研究进一步将情绪得分与时间维度聚合，以刻画公众评价的总体情绪取向及其时序波动特征。

（3）主题识别与主题结构分析

研究采用BERTopic对评论文本开展无监督主题挖掘，以刻画主题结构，识别公众关注的空间要素与问题类型[39-41]。相较于LDA等词袋模型，BERTopic更适用于短文本语料：一方面，UGC文本稀疏且同义表达丰富，基于词频共现的主题推断易受词形差异影响；另一方面，实际主题数量难以预设且语料包含噪声文本，需具备自适应聚类与噪声识别能力。BERTopic基于Transformer语义嵌入表征句级语义，并结合密度聚类形成主题簇，可在不预设主题数的前提下识别稳定主题并过滤噪声。模型流程包括语义嵌入、降维、聚类和关键词提取。首先，研究基于Transformer预训练语言模型生成语义嵌入向量，随后采用UMAP降维以保留主要语义结构并降低计算复杂度，再以HDBSCAN实现自适应聚类，最后通过类加权提取主题关键词并完成主题命名。关键参数设置包括：嵌入维度384，UMAP降维后维度15，最小聚类样本数10，c-TF-IDF权重系数α=0.75。模型输出主题经人工校验以确保语义一致性与可解释性，并通过层次结构图呈现主题分布与关联。在总体评论主题分析的基础上，本文将积极评论与消极评论分别作为独立语料集进行BERTopic建模，识别两类评论的核心主题及代表性关键词，并通过比较其主题构成，分析不同情绪评价所对应的主要体验内容及空间指向。

4 研究结果

4.1 数字空间存在及其扩张特征的统计刻画

在数字空间存在方面，样本园区的评论量呈现显著层级分布（图3）。七宝老街民俗产业基地以24 277条评论居首，其后依次为上生新所、1933老场坊、上海玻璃博物馆与上海国际时尚中心。与此同时，园区数字存在并非随时间线性增长，而与实体空间更新阶段存在关联（图4）。样本园区的更新改造时间主要集中于2010~2016年。值得注意的是，上生新所虽于2016年底对外开放，但评论量已位居第三，表明部分园区可在较短时期内实现评价快速集聚，并通过到访—评价—再传播的循环加速数字空间的扩张。

从物理空间分布看，样本园区在中心城区呈现明显集聚，而郊区相对较少。除区位与可达性差异外，该格局亦表明核心城区具有更高强度的日常活动、消费场景与平台使用行为，提升了评价积累的频率与持续性。进一步地，为解释数字形象在不同园区间的结构差异，本文依据功能与性质将样本园区划分为产业导向型、艺术驱动型、休闲娱乐型、地方特色展示型与综合混合型5类。产业导向型园区以企业与产业服务为主（如中成智谷创意园）；艺术驱动型多由旧厂房或仓库改造并以艺术生产与展示为核心（如M50创意园、上生新所）；休闲娱乐型强调消费与游憩体验（如8号桥、800秀、现所）；地方特色展示型侧重历史风貌与民俗传承（如金山嘴渔村、七宝老街民俗产业基地、青溪老街）；综合混合型则呈现产业服务、休闲娱乐、历史风貌等多功能复合（如1933老场坊、得丘礼享谷）。

4.2 文创园区的情绪感知分析

样本文创园区的总体平均情绪得分为0.83。图5所示园区的平均情绪得分均高于0.7，表明公众对上海市文创园区的评价整体呈积极倾向。统计结果显示，积极评论共58 625条，占总评论数的85%；消极评论占10%，中立评论占5%。其中，M50创意园与幸福里文创园的平均情绪得分均超过0.9，处于较高水平。从得分较高园区的类型构成来看，艺术驱动型与休闲娱乐型园区相对集中，这类园区通常具有较鲜明的艺术特色、休闲氛围和视觉形象，较易获得公众的积极评价。

从年度变化趋势来看，2016—2019年文创园区的平均情绪得分持续上升，2020—2022年明显下降，2023年后逐步回升（图6）。结合同期社会背景，疫情前公众评价呈稳步上升趋势，表明在政策扶持和持续更新背景下，文创园区的空间环境与运营服务获得了较为积极的公众反馈。疫情期间评价水平明显下降，可能与访客活动减少、园区运营受限以及公共服务体验下降有关。疫情后，随着线下活动和园区运营逐步恢复，公众评价呈现回升趋势，这可能与园区活力恢复、设施服务改善及管理水平提升等因素有关，反映出游访体验的逐步恢复与提升。

4.3 文创园区的核心主题分析

基于BERTopic主题模型，研究从评论文本中提炼出28个主题，并按出现频率由高到低排序（图7）。结果显示，高频主题主要围绕儿童游

乐、交通出行、历史建筑、美食与购物等日常体验展开。各主题在语义空间中呈现清晰的聚类分布：儿童游乐（主题0）形成最大集群，表明家庭休闲与亲子活动是公众讨论较为集中的内容主题；交通出行（主题1）受到广泛关注，反映出可达性是公众评价园区的重要方面；历史文化（主题2）与建筑遗址（主题3）均与历史建筑相关，说明建筑风貌与空间再利用是公众认知园区的重要内容。此外，周末约会（主题15）与周中状况（主题18）分别呈现了公众在周末休闲和工作日游览情境下的体验差异，反映出园区访问活动具有一定的时间节律特征。网红餐厅、音乐演出、婚礼庆典和动漫展览等主题揭示园区的差异化吸引力与事件驱动特征。与此同时，部分主题直接指向基础设施与体验短板，提示公共服务与运营管理在塑造整体感知中的约束作用。

研究依据28个主题的语义相似性，进一步将其归并为文体活动、休闲生活和历史文化3个主题群，反映了公众评论内容之间的语义关联与层级结构（图8）。其中文体活动主要涉及展览、演出、庆典与赛事；休闲生活集中于餐饮、打卡、夜景及不同时段的游览体验；历史文化则以历史建筑、建筑遗址和特色艺术为核心，并与交通、游乐、购物等实际使用体验相联系。

4.4 积极和消极评论的核心主题分析

研究进一步将积极评论与消极评论分别进行主题建模。分析结果显示，积极与消极评论的主题分布存在显著差异（图9）。情绪分化更直接地关联于游客在园区内关键体验和空间要素：交通可达与到达体验、空间吸引节点（如历史建筑与艺术展览），以及公共服务设施与运营管理（如卫生、服务与秩序），构成主要触发来源。积极评论多围绕交通出行、儿童游乐、艺术展览、拍照打卡与历史坐标展开，显示当可达性、节点吸引与活动供给形成合力时，更易促成到访、体验、表达的正向反馈；消极评论则以“失望”等负向表达为主，常借以前与现在的对比呈现体验下降，并集中指向服务态度、天气条件与卫生设施不足等问题。

上述对比表明，一方面，具有较强可传播性的空间要素（如历史建筑、艺术展览与可拍摄节点）更易被转译为UGC并扩散，从而强化积极印象；另一方面，基础性空间要素（如卫生设施、服务管理与秩序维护）虽缺乏同等传播优势，但一旦出现短板，往往以负向体验被集中表达并快速累积，对园区整体形象形成约束。因此，公众感知差异不仅表现为文创园区位与类型差异，也取决于内部空间要素供给与治理能力在社交媒介传播中的放大效应。

5 讨论

5.1 公众感知评价的空间差异形成机制

公众感知评价结果表明，文创园区间的评价差异并非由园区类型或区位条件等单一因素决定，而是在虚实互动过程中动态生成的。园区内部空间要素进入社交媒介后，被用户选择性书写并转译为UGC，在平台推荐与信息流动作用下获得差异化的可见性与互动，从而塑造不同的数字形象。该数字形象进一步影响潜在到访者的预期与行为，并通过线下体验与再生产内容持续强化或修正既有认知。基于这一虚实互动过程，文创园区公众感知差异的形成可概括为符号生产与传播、要素的阈值约束以及注意力分配与场所再生产3类机制。

首先，可传播性驱动的符号生产机制。在社交媒介语境下，具有较强视觉指向与叙事潜力的空间要素更易被转译为图像化、故事化的UGC。这解释了艺术驱动型及部分休闲娱乐型园区更易形成稳定正向评价的原因：其空间节点具备可记录、可展示、可模仿的传播属性，使个体体验更容易被复制传播，进而强化群体层面的正向预期。由此，实体空间的美学要素与活动供给不仅能够提升现场体验，还通过符号化过程在虚拟空间实现二次赋权，推动到访、表达、再传播的正向反馈。

其次，阈值要素约束下的体验稳定机制。与可传播性要素不同，交通可达、卫生设施、服务态度与秩序维护等基础性要素具有显著的阈值特征：在满足基本要求时往往难以成为显性传播内容，一旦出现缺口则更易在平台上快速累积负面评价。因此，当园区在运营与维护上无法维持体验稳定性时，公众更倾向于将其理解为质量退化而非偶发事件，从而加速负向评价的扩散。由此，空间差异在虚实互动中呈现出正向扩散依赖可传播性、负向累积受制于阈值要素的特征。

再次，流动空间中的注意力分配与场所再生产机制。园区形象不完全由地理邻近性决定；随着UGC的传播、聚合与推荐，部分园区在较短时间内获得跨地域可见性，并将线上预期转化为线下到访。高可见性园区更易吸引到访并生成新的UGC，进一步巩固其数字形象；而可见性不足或符号定位不清的园区则难以进入传播链条，形成低到访、低产出、低可见的“恶性循环”。中心城区园区因日常活动密度更高、平台使用更频繁，更容易在该回路中形成累积优势；郊区园区若缺乏明确的符号定位与稳定的基础服务供给，则更易出现回路弱化与评价偏低。因此，文创园区不再仅是实体空间品质的竞争，也是虚拟空间符号生产、实体空间物质供给与社会消费需求的协同能力竞争。

5.2 公众感知视角下文创园区空间优化策略

基于大众点评UGC的情绪识别与主题分析结果，本文对上海市文创园区提出如下实体空间响应策略与可执行措施。

首先，以正向高频主题为优先投入方向，强化可识别的空间节点。主题结果显示，历史建筑、艺术展览、拍照打卡等主题在积极评论中占据核心位置，且高分园区多集中于艺术驱动型与休闲娱乐型。相应地，实体空间更新应围绕高频正向主题配置关键节点：在主要界面与动线节点强化历史建筑展示、展陈装置与标志性景观界面，并通过照明、材质

与视线组织提升可感知性与可拍摄性；同时，将建筑、展陈、活动、休憩等高频体验要素组织为连续动线，以周期化活动（如展览季、主题市集、夜间开放等）保持内容供给的连续性，避免单点式造景导致短期热度与长期同质化。

其次，以高频负向主题为依据明确体验底线，优先治理影响体验稳定性的关键空间要素。消极评论集中指向卫生设施、服务态度与拥挤秩序等主题，表明其对总体评价具有显著约束。实体响应应将负向高频主题视为治理重点：围绕交通出行优化入口识别与导视体系，完善“最后一公里”衔接并在高峰时段实行动态分流；提高关键节点的卫生设施配置强度与维护频次，建立投诉点位的闭环整改机制；强化标准化服务与弹性管理（如限流、排队组织、动线分隔与应急预案），以降低体验波动、抑制负向评价累积。

最后，构建常态化评估闭环，推动空间更新与运营治理的协同迭代。为提升策略的可执行性与可检验性，以园区月度平均情绪得分和消极评论占比作为预警指标，以负向主题出现率作为问题定位指标，形成园区级感知仪表板；建立问题、整改、复核的台账，以评估整改成效；将正向核心主题的稳定性与多样性纳入内容供给评估，将负向高频主题的减少程度纳入运营绩效评估，从而形成以数据反馈驱动的持续改进机制。通过上述闭环，将数字形象的波动及时转化为具体治理行动，实现园区空间品质的精细化、可持续化提升[42]。

5.3 研究优势与局限性分析

本研究基于UGC大数据的深度挖掘，有效提升了研究的精度与样本覆盖范围，揭示了更加细腻的公众感知结构。本文构建了融合深度学习与主题语义分析的公众感知框架，突破了传统问卷和访谈在样本量、时间连续性及主观偏差方面的局限，实现了对公众认知与情绪变化的动态刻画。通过剖析数字空间形象塑造与实体空间响应的关系，研究揭示了社交媒介在城市文化空间重塑中的循环机制，形成了可复制的公众感知分析路径，为城市文创园区的空间治理提供了可推广的数字化决策模型。

尽管如此，本研究仍存在一定局限性。研究数据来源于大众点评平台的评论样本，集中于中青年与消费型到访者，周边居民、从业者及非消费目的使用者等群体的观点可能未被有效覆盖。与此同时，平台的结构化评分与标签强化了交通、服务、卫生等可评价要素的显性表达，相对削弱了地方记忆、文化叙事与社会交往网络等隐性空间价值的呈现。此外，单一平台数据亦限制了对符号化传播和到访转化等过程机制的跨平台检验与稳健性验证。因此，未来研究将整合多平台数据开展交叉验证，以降低平台偏倚对结论的影响；结合问卷与深度访谈补充社会人口学特征与到访动机变量[43]，增强公众感知推断的解释力，从而更精细地刻画虚实互动对空间治理的反馈机制。

6 结论

社交媒介的普及使公众对文创园区的感知从现场体验延伸至线上表达，UGC成为连接城市文化空间与公众情绪的重要信息载体。本文以上海市37个典型文创园区为研究对象，基于大众点评平台评论数据构建“数字空间刻画–情绪感知–主题识别”的测度框架，综合采用基于CNN的Senta情绪识别与基于Transformer的BERTopic主题建模，刻画公众情绪取向与主题结构，并据此提出面向空间更新与运营治理的响应策略。主要研究发现包括：

1）文创园区数字空间存在呈现显著分层。核心城区园区总体更易形成评论积累与平台可见性优势，但部分开放运营年限相对较短的园区也形成了较高的平台关注度，表明UGC传播在一定程度上有助于扩大园区的数字影响范围，弱化地理邻近性对公众关注的限制。

2）公众情绪总体呈显著积极倾向，并在不同类型园区之间表现出系统性差异。积极评论约占85%，艺术驱动型与休闲娱乐型园区情绪得分相对更高，表明公众对具备参与性、停留性与可分享性的体验型文化空间具有稳定偏好，正向评价更易在到访–表达–再传播的循环中累积。

3）主题结构呈多维分化，对园区虚拟形象具有双重约束机制。儿童友好、交通便捷与历史建筑等日常体验要素为高频主题；历史建筑与文化风貌、艺术展览与拍照打卡构成正向主题核心；负面评价集中于卫生、服务与秩序等基础运营方面。园区口碑既依赖可传播的内容与空间节点所形成的吸引力，也受制于阈值型基础要素对体验稳定性的约束。

基于上述发现，本文进一步提出面向实体空间响应的优化路径。以正向高权重主题为锚点，体系化塑造历史界面、展陈与活动等可传播节点，提升空间的可识别性与可叙事性；以高频负向主题为底线，优先补齐交通衔接、卫生设施、服务流程与秩序维护等阈值要素，降低体验波动；同时以UGC情绪与主题指标构建监测、整改、评估闭环机制，为园区空间更新、运营治理与数字形象的协同提升提供支撑。

图 1. 研究样本分布图
图 2. 研究框架
图 3. 文创园区评论数量分布图
图 4. 文创园区开放时间分布图
图 5. 各文创园区的平均情绪得分
图 6. 文创园区年度平均情绪得分
图 7. 文创园区评论的主题词：纵轴为主题下排名前五的关键词，横轴为该关键词在该主题的权重。
图 8. 文创园区评论主题的层次结构：不同颜色代表层次聚类识别得到的不同研究集群：紫色代表文体活动主题群，红色代表休闲生活主题群，蓝色代表历史文化主题群。横轴为主题间距离，距离越小代表主题相似度越高。
图 9. 积极与消极评论中排名前 5 的高频主题及代表性关键词（横坐标为积极或消极评论中按频率由高到低排列的前 5 个主题；纵坐标为各主题中按词频由高到低排列的前 5 个关键词，圆点越大，表示该关键词在该主题下的出现频率越高）。