

Exploring Meanings and Experiences of Public Spaces: Topic Modelling Insights from Museum Gazhane

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Abstract

Public spaces function as both material and symbolic environments for public life, where individuals construct and share meanings through experience. This study explores the symbolic and experiential meanings of public space by analysing user-generated content about Museum Gazhane. Drawing on 3,025 Google Maps reviews (2021–2024), it adopts a two-stage methodology: Latent Dirichlet Allocation (LDA) is used to detect thematic patterns, which are then interpreted through Critical Discourse Analysis (CDA) to reveal how narratives express social meanings. This integrative approach combines computational scalability with critical depth, enhancing both methodological rigour and interpretive nuance. Findings offer insights into how digital narratives reflect public perceptions and symbolic attachments, while highlighting the value of user-generated content for informing inclusive and responsive public space planning in contemporary cities.

1. Introduction

Public spaces are key components of urban life, enabling social interaction, cultural expression, and everyday functionality (Gehl, 1987; Jacobs, 1961; Neal, 2010). They also serve as symbolic landscapes where collective memory and urban identity are formed (Lynch, 1960; Zukin, 1995; Crilley, 1993). However, the nature of public spaces has become increasingly complex in the contemporary city. Spaces once associated with democratic ideals have been reshaped by the logic of neoliberal urban policies to enhance global competitiveness and create new images for cities (Boyer, 1993; Ercan, 2016; Madanipour, 2000, 2019). Consequently, scholars have renewed their focus on the evolving roles and typologies of public spaces. Yet dominant research approaches often emphasise specific dimensions—such as physical design (Carmona, 2010), governance models (Low & Smith, 2006; Magalhães, 2010), or user behaviours (Whyte, 1980; Shaftoe, 2008)—while underemphasising their symbolic and experiential meanings. Traditional methods such as surveys and interviews also have limitations in capturing the discursive and affective layers of spatial experience, particularly in light of sampling bias and the temporal nature of public life.

This study addresses these methodological gaps by examining digital user reviews as an alternative perspective on public space experiences. Focusing on Museum Gazhane—an industrial heritage site in Istanbul that has been adaptively reused as a cultural public space—the research aims to uncover the key themes and patterns expressed in user-generated content. Drawing on 3,025 Google Maps reviews from 2021 to 2024, the study employs Python-based text mining and Latent Dirichlet Allocation (LDA) topic modelling to analyse how users articulate their experiences, expectations, and symbolic associations.

To enhance both analytical depth and methodological robustness, the study adopts a two-stage interpretive framework. First, Latent Dirichlet Allocation is used to identify the latent thematic structure across the large corpus of user reviews. Second, these topics are subjected to close reading through the lens of Critical Discourse Analysis (CDA) (Fairclough, 2003, 2010; Van Dijk, 1993, 2003; Wodak & Meyer, 2016), enabling the exploration of how meaning, ideology, and power operate within user narratives. Combining topic modelling and discourse analysis provides a systematic yet interpretive approach that bridges the gap between scale and nuance, allowing both macro-pattern detection and context-sensitive interpretation. This integrative strategy not only increases the credibility and reliability of the findings (Jacobs & Tschötschel, 2019) but also contributes to methodological innovation in public space research by responding to the challenge of analysing large volumes of user-generated text without losing discursive richness (Törnberg & Törnberg, 2016; Mullenbach, 2022).

By analysing digital user narratives, this study provides insights into how spatial meanings are constructed through everyday experience, while offering practical implications for the design and management of public spaces in contemporary cities. The central research questions guiding this inquiry are as follows: (1) How is Museum Gazhane represented in user reviews? (2) How do these representations intersect with users' experiential relationships to the space, its historical transformation, and broader context? (3) How might such representations inform the planning, design, and governance of public spaces?

The remainder of the article is structured as follows: Section 2 presents the study's theoretical foundation, including a review of public space roles and the analytical potential of digital user data. Section 3 outlines the methodological process, including data collection, preprocessing, and data analyzing. Section 4 presents the findings of the LDA analysis, organised around five principal thematic clusters. These clusters are interpreted in relation to the sociocultural and political layers of meaning embedded in public spaces. Finally, Section 5 discusses the study's theoretical and practical contributions, reflects on its limitations, and proposes directions for future research.

2. Literature Review

This section presents the study's theoretical foundation, including a review of public space roles and the analytical potential of digital user data.

2.1 The Multifaceted Roles of Public Space

Drawing on critical urban theory, particularly Lefebvre's (1991) notion of the production of space and Massey's (2005) concept of relational space, this study conceptualises public space as a dynamic and contested terrain shaped by social relations, discourses, and everyday practices, rather than as a fixed or neutral container. According to this view, spatial meaning is continuously reconstituted through the interplay of material and symbolic dimensions. Tracing this theoretical lineage historically reveals how the meanings and functions of public spaces have evolved.

Public spaces have historically embodied shifting sociopolitical agendas, evolving from democratic Agora to commodified landscapes shaped by neoliberal urban restructuring (Mumford, 1961; Sorkin, 1992). These spaces have functioned as multilayered constructs in which social relations, cultural representations, political participation, and economic strategies are negotiated and reproduced (Lefebvre, 1991; Madanipour, 1995). Thus, public spaces are not neutral; they reflect and reproduce power relations, embedding inclusive and exclusionary logics. As Mitchell (2003) argues, the question of whose narratives are represented—and whose are erased—ultimately determines which identities are legitimised.

Building on this historical and theoretical foundation, this study conceptualises public space as a multifaceted domain and examines its meanings and lived experiences through five interrelated roles: social, physical, symbolic, political, and economic.

- **Social Role:** Public spaces are vital arenas for collective life. They enable everyday encounters and social interactions that engage people across ethnic, gender, and class lines (Madanipour, 1995; Mehta, 2014). They foster cohesion and the negotiation of difference by supporting both planned and spontaneous interactions (Jacobs, 1961; Sennett, 1971). Thus, they serve as dynamic zones where conflict and consensus coexist, reinforcing social cohesion through continuous, layered exchanges.

- **Physical Role:** Public spaces are integral to the urban fabric, linking streets, squares, and parks to ensure spatial continuity and ecological balance (Carr et al., 1992; Thompson, 1998; Ellis, 1978). The physical design of public spaces, shaped by walkability, openness, and comfort, influences not only mobility and microclimates, but also enhances psychological well-being and patterns of social engagement (Gehl, 2010; Moughtin, 1999; Whyte, 1980). Thus, public spaces serve as structural elements of the built environment and as stages for everyday social life.

- **Symbolic Role:** Public spaces serve as repositories of collective memory, cultural identity, and ideological meaning (Lefebvre, 1991; Mehta, 2023). While Lynch (1960) emphasises the role of urban form and legibility in producing shared meaning, Mitchell (2003) points out that symbolic representation often reflects dominant power structures, thereby marginalising alternative narratives. Everyday practices and shared rituals reinforce a sense of belonging, yet these spaces also become sites of contestation over cultural visibility and historical legitimacy.
- **Political Role:** Public spaces constitute vital democratic arenas characterised by the interplay of power and resistance, the negotiation of social demands, and the continual re-creation of political meanings. By facilitating encounters among strangers and elevating marginalised voices, they foster civic engagement, political expression, and collective identity formation. Their essential role in enabling both solidarity and dissent underscores their democratic necessity (Shaftoe, 2008).
- **Economic Role:** Public spaces have historically functioned as centres of commerce and urban vitality (Lofland, 1971; Thompson, 1998; Gehl, 1996). Beyond direct commercial activity, these spaces generate economic value by attracting tourism, raising property values, and enhancing urban competitiveness (Shaftoe, 2008). However, under neoliberal development, the commodification of these spaces often prioritises exchange value over public use. This exacerbates spatial inequalities and diminishes equitable access.

The interplay of these five roles—social, physical, symbolic, political, and economic—highlights the multifaceted nature of public spaces. These spaces are neither neutral nor static; rather, they serve as arenas of both cooperation and contestation, shaped by overlapping and often competing logics. This conceptual framework enables a systematic analysis of the lived, perceived, and contested meanings attributed to public spaces, and it underpins the methodological approach adopted in this study.

2.2 The Use of Digital Data in Public Space Research

In recent years, an expanding body of literature has recognised social media as valuable data sources capable of addressing the limitations of traditional field-based methods. Social media-derived data can access broader and more diverse user groups than surveys or interviews, while also capturing real-time, everyday experiences. In doing so, they illuminate the layered perceptions individuals hold about public spaces (Sim & Miller, 2019; Cheng et al., 2022). This enables researchers to explore how urban environments are experienced and interpreted through user practices and affective encounters (Liu & Xiao, 2021; Song et al., 2020).

Kaplan and Haenlein's (2010) broad definition of social media—as internet-based platforms enabling the creation and exchange of user-generated content—is adopted here. This encompasses various formats such as blogs, media-sharing sites, and online forums. Similar to traditional mass media, social media influences public perception by framing issues and events (Moscovici & Duveen, 2000). In this study, Google Maps user reviews are utilised as a form of social media data to examine public perceptions and experiences of urban space.

User reviews on platforms such as Google Maps and TripAdvisor have become prominent tools for analysing urban space. Since 2015, Google Maps has surpassed platforms like Yelp and Facebook in terms of data volume and engagement, becoming the most widely used location-based review platform globally (Munawir et al., 2019). Its accessible interface and large user base generate rich data—comprising star ratings, time-stamped narratives, and images—well suited to both quantitative and qualitative analysis.

Studies on urban parks and public spaces have highlighted the analytical value of such data in revealing usage dynamics. For instance, Song et al. (2020) used LDA topic modelling on TripAdvisor reviews of Bryant Park in New York to relate user experiences to spatial quality, offering insights for design and management. In a follow-up study, Fernandez et al. (2022) analysed seasonal variation in perceptions, demonstrating how social media data can track experiential shifts over time. Expanding this approach, Song et al. (2023) combined LDA and qualitative analysis of seven years of High Line Park reviews, illustrating how programming, history, and design influenced user experience.

Other studies have employed similar methods to assess spatial quality and satisfaction. Liu and Xiao (2021) applied text mining and sentiment analysis to Google reviews of parks in Shenzhen, identifying key physical factors—such as landscape quality and amenity diversity—through regression models. Munawir et al. (2019) examined Bandung's thematic parks to explore urban branding effects. In Jakarta, Saragih et al. (2024) used content analysis of Google reviews to identify four dimensions of inclusive design in child-friendly spaces: activity diversity, child infrastructure, environmental quality, and supporting amenities.

Digital user data also offer insight into the symbolic and emotional dimensions of public space. Wang et al. (2020) analysed eleven years of TripAdvisor reviews on the Las Vegas Strip using sentiment analysis and LDA to explore sense-of-place elements such as belonging, identity, and attachment. Similarly, Sohi et al. (2024) employed social network analysis to map perceptions of liveliness, comfort, and safety in Tehran's historic bazaar, informing urban design interventions.

Collectively, these studies demonstrate the methodological flexibility of digital user reviews in analysing spatial perception, usage patterns, satisfaction, and urban identity across scales. Their integration into planning and design offers scalable, real-time, and user-centred insights for data-informed decision-making. However, social media data are not without limitations. As voluntary content, they may lack representativeness—particularly for demographics with limited digital access, such as older adults, low-income groups, or critical voices. These biases underscore the need for reflexive, context-sensitive approaches when incorporating digital data into public space research.

A growing strand of research also highlights the value of combining computational techniques such as topic modelling with interpretive approaches like Critical Discourse Analysis (CDA). While LDA efficiently detects latent patterns across large datasets, it lacks embedded theoretical assumptions about meaning-making. CDA, in contrast, situates textual meaning within broader socio-political and ideological frameworks. The integration of these methods allows researchers to detect, interpret, and critically assess the construction of meaning in discourse, especially in domains such as identity, ideology, and hegemony (Jacobs & Tschötschel, 2019; Törnberg & Törnberg, 2016).

For instance, Jacobs and Tschötschel (2019) demonstrate how topic modelling, when used with appropriate parameters, can strengthen discourse analysis by improving transparency, scaling, and interpretive depth. Similarly, Törnberg and Törnberg (2016) show how combining LDA with CDA enables the exploration of complex ideological intersections—in their case, between Islamophobia and anti-feminism—within massive corpora of online content. Mullenbach (2022) further applies CDA to urban park discourse to reveal how elite narratives around public space planning obscure power asymmetries and environmental injustice, emphasizing the importance of reflexive and critical readings of spatial discourse.

3. Methods and materials

This study adopts a mixed-methods digital research design to examine how public perceptions, representations, and experiences of Museum Gazhane are constructed through online user-generated content. Recognising the increasing relevance of digital platforms as arenas for discourse and meaning-making, the study employs computational text analysis—specifically Latent Dirichlet Allocation (LDA) topic modelling—to uncover latent thematic structures within Google Maps reviews.

The methodological process unfolds in three interrelated stages: (1) the historical and spatial contextualisation of the study site; (2) the systematic acquisition and preprocessing of user review data; and (3) the application of LDA topic modelling to detect and interpret recurring semantic patterns.

This framework facilitates the analysis of large-scale user narratives, offering insights not only into individual experiences but also into broader sociopolitical imaginaries. Through this approach, the study addresses how users evaluate the physical and functional aspects of Gazhane, while also uncovering the symbolic, political, and

emotional meanings embedded in their digital articulations.

3.1 Study Site: Museum Gazhane

Museum Gazhane—historically known as the Hasanpaşa Gasworks—stands out as a critical case due to its transformation from an industrial heritage site into a vibrant public space, reflecting both the challenges and opportunities of preserving historical significance while addressing contemporary urban needs. It offers a unique, multifaceted, and symbolically rich example of the evolving understanding of public space in Istanbul.

The Hasanpaşa Gasworks, established in 1892, served as a vital component of the city's energy infrastructure for several decades (Göklü, 2003). Following its decommissioning in 1993, the site remained in a state of suspension for approximately thirty years. In the early 2000s, efforts to conserve and restore the Gasworks were initiated by neighbourhood-based collective movements. Over time, this initiative underwent transformation under the influence of various institutional actors.

During this period, spatial demands concerning the site centred not only on the right to access and use it, but also on the symbolic meanings shaped through representation and collective memory. The spatial discourses that emerged coalesced around themes such as public rights, cultural heritage, and communal values, significantly contributing to the redefinition of the site's public character. A comprehensive restoration project, completed by the Istanbul Metropolitan Municipality (IMM) in 2021, refunctionalised the site as a "culture- and art-oriented living space" and reintroduced it to the public under the name "Museum Gazhane."

Today, Museum Gazhane functions as a dynamic arena in which the material and symbolic dimensions of public life are continually co-constructed and renegotiated. Its evolution from a grassroots movement to a municipally led project exemplifies the interplay between community-driven efforts and institutional interventions in shaping the symbolic and experiential meanings of public spaces.

Beyond its physical presence, Gazhane's extensive digital visibility—particularly through user reviews on Google Maps—offers a valuable opportunity to investigate how everyday users perceive, interpret, and contribute to the space's evolving significance. This digitally mediated layer of engagement allows for the analysis of affective geographies, representational narratives, and spatial practices as they unfold in real time. As such, it serves as a valuable methodological interface for examining the dynamics of contemporary public space.

3.2 Data Collection and Preprocessing

Data for this study comprised 3,025 user reviews of Museum Gazhane extracted from Google Maps (2021-2024) using the Outscraper tool and Google Maps Reviews API. Automated scraping enabled efficient, large-scale data collection (Munawir et al., 2019; Song & Zhang, 2020).

Only Turkish-language reviews were retained to prioritize local user perspectives. This decision was taken to better reflect local user perceptions and provide a culturally grounded interpretation of spatial experience (Borrego & Comalat-Navarra, 2020). Due to limited advanced Turkish NLP resources, reviews were translated into English using DeepL Translate. Semantic accuracy was ensured through manual verification of a randomized sample and iterative refinement guided by a domain-specific bilingual glossary developed via comparative word frequency analysis.

Translated texts were converted into an analysable format using Python. Standard preprocessing techniques—including tokenization, stop-word removal, stemming, and lemmatization—were applied. The final preprocessed corpus consists of 92,842 words, structured to ensure coherence and interpretability for topic modelling.

3.3 Data Analysis

The analysis proceeded in two main phases: LDA topic modelling and discourse analysis. This two-stage design enabled the detection of latent thematic structures at scale, followed by their context-sensitive interpretation through qualitative techniques.

Phase 1: Topic Modelling

Following the preprocessing phase, Latent Dirichlet Allocation (LDA) was applied to uncover the latent thematic structures embedded within user reviews. LDA, a probabilistic topic modeling technique, automatically infers semantically consistent themes ("topics") from large text corpora by analyzing patterns of word co-occurrence, thereby offering a scalable yet flexible approach to textual analysis (Blei et al., 2003; Song et al., 2020). It is particularly effective for heterogeneous datasets such as user reviews, where meanings emerge from dispersed and context-dependent expressions (Song et al., 2020).

A critical step in topic modelling is identifying the optimal number of topics. The coherence score—evaluating the semantic consistency among a topic's top keywords—is widely used for this purpose, balancing computational robustness with interpretive clarity (Röder et al., 2015). In this study, multiple LDA models were tested across a range of 2 to 30 topics. The five-topic model was ultimately selected based on its highest coherence score and its ability to produce analytically distinguishable outputs.

To enhance interpretability, the model was further refined using saliency and distinctiveness metrics (Chuang et al., 2012). These helped eliminate low-density or overlapping clusters and improved thematic clarity by highlighting conceptually salient groupings of terms.

Phase 2: Interpretive Analysis and CDA Integration

The second phase involved qualitative interpretation of the five topics using a combination of computational outputs and discourse-informed reading. For each topic, word clouds were generated to visualise the most salient terms. Additionally, the top 50 user reviews with the highest probability scores per topic were selected for close textual reading.

In this phase, Critical Discourse Analysis (CDA) was adopted as a guiding interpretive framework. CDA enables researchers to explore how language constructs and reflects social meanings, ideologies, and power relations (Fairclough, 1995). In line with recent methodological advancements, topic modelling and CDA were integrated to maximise both empirical breadth and critical depth (Jacobs & Tschötschel, 2019; Törnberg & Törnberg, 2016). While topic modelling captured recurring discursive patterns across a large dataset, CDA contextualised these patterns, attending to symbolic associations, affective registers, and underlying assumptions embedded in everyday spatial narratives.

Interpretation was anchored in the conceptual framework outlined in the literature review, particularly the five foundational roles of public space—social, physical, symbolic, political, and economic. This alignment ensured that the findings were not only statistically valid but also theoretically meaningful. By mapping each topic onto these conceptual dimensions, the study bridged computational analysis with critical spatial theory to examine how users experience, represent, and evaluate Museum Gazhane.

In sum, this methodological strategy demonstrates the analytical potential of user-generated content when approached through a combined computational-qualitative lens. The integration of LDA topic modelling with discourse analysis not only enhances interpretive validity but also contributes to ongoing methodological innovation in urban studies by offering a scalable, transparent, and critically reflexive tool for investigating public space representations in digital environments.

4. Findings

Using a two-stage methodology combining Latent Dirichlet Allocation (LDA) and Critical Discourse Analysis (CDA), this study identified five thematically distinct topics within Google Maps reviews of Museum Gazhane. These topics reflect diverse user perspectives, ranging from emotional and sensory impressions to critiques of management, multifunctional uses, and symbolic meanings. Each topic is detailed in the following subsections (4.1–4.5), drawing on keyword distributions, word clouds, and close readings of representative reviews.

4.1 Symbolic and Historical Transformation

This topic reflects the transformation of Müze Gazhane from an industrial heritage site to a cultural centre and the social perception of this transformation. The higher salience of terms such as “art,” “culture,” “Kadıköy,” “become,” “centre,” “gasworks,” and “new” in the relevant topic demonstrates the experience of Gazhane’s transformation from an industrial past to a cultural attraction centre. The higher distinctive terms in the topic, such as “culture,” “restoration,” “transform,” “hasanpasa,” “high,” “gasworks,” “gas,” “meet,” “kadikoy,” “historical,” and “industrial,” indicates that users possess a recognition of the historical identity of the area and hold a favourable perspective on its adaptation and reuse (Figure 1).

This thematic structure underscores Gazhane’s dual public character: Gazhane serves as a historical symbol of industrial heritage while also functioning as a contemporary living space that fosters art, social interaction, and cultural production. This duality is frequently emphasized by users who define the transformation as a harmonious synthesis of heritage preservation and modern functionality. The transformation of Gazhane has been met with a favourable reception by users, who regard it as a successful integration of historical preservation and contemporary urban adaptation.



Figure 1. LDA Terms for the Topic “Symbolic and Historical Transformation”- overall frequency (left), saliency (centre), and distinctiveness (right)

The social interpretation of Gazhane Museum focuses on issues related to historical significance and cultural functions as well as aesthetic values. Expressions such as “high,” “quality,” “successful,” “breathe,” and “need,” which are particularly salient in word analyses, point to the high-quality urban environment offered by Gazhane and the community’s need for such spaces. The repeated use of the term “quality” in the commentary indicates that Gazhane is recognized for its aesthetic values and spatial design. This contributes to the consolidation of the area’s physical and psychological significance. The physical quality of the area is not limited to visual appeal; it also integrates with the spatial experience of users. For instance, assertions such as “It’s a very high-quality environment” and “A culture and arts centre of European quality” demonstrate that Gazhane is evaluated not only on a local scale but also according to international standards.

The Gazhane Museum also has a strong perception in terms of local identity and public ownership. The use of keywords such as “neighborhood,” “Hasanpaşa,” and “Kadıköy” serves to underscore the area’s intricate interconnection with its immediate environment. The Hasanpaşa neighbourhood, where Gazhane is located, represents not only the physical location of the venue but also its interaction with the neighbourhood residents and the value it adds to their lives. For instance, the assertion that “This new cultural space in Hasanpaşa has revitalized the neighbourhood” underscores the transformative impact of Gazhane on the local community. The statement, “Having such a place in the heart of Kadıköy is a great opportunity for our neighbourhood,” reflects the perception of Gazhane as a public space integrated with local identity. The statements indicate that the

space has been formally accepted by its users, thereby becoming an integral component of its spatial identity. While functioning as a meeting point at the neighbourhood level, the Museum Gazhane is also regarded as a significant cultural focal point for the broader district identity of Kadıköy.

Consequently, this topic positions the Gazhane Museum as a public space where industrial heritage is preserved and reimagined with contemporary cultural functions, thereby strengthening local identity and social ownership. This topic demonstrates the Gazhane Museum's strong integration into contemporary urban life, as evidenced by its preservation of historical identity and its revitalization through cultural functions. Notably, Gazhane has become a meeting point for the local community and a powerful symbol of the evolving concept of public space in contemporary Istanbul.

4.2. Institutional Representation and Public Appreciation

This topic underscores the dual perceptions of Museum Gazhane among users: firstly, as a public-benefit transformation project, and secondly, as a means of institutional representation. Higher salience terms in topic such as "thank," "everyone," "wonderful," "contribute," "İBB," "public," "Ekrem," "city," "work," and "congratulate" reveals a strong sense of public appreciation for the adaptive reuse of the site. The basis for this appreciation is the institutional visibility of the Istanbul Metropolitan Municipality (İBB) and its mayor, Ekrem İmamoğlu. Furthermore, higher distinctive terms in topic such as "feel," "transformation," "preserve," "project," "social," "hope," and "artistic" underscores that this transformation is perceived not only as a physical intervention but also as a symbolic representation of collective hope and social progress (Figure 2).

A review of user comments pertaining to this subject indicates that Gazhane is regarded not solely as a cultural venue, but rather as a public space that is both accessible and inclusive, thereby fostering public life and promoting cultural participation. Key words such as "public," "example," "neighbourhood," "preserve," and "social" emphasize the social dimension of the transformation. Expressions such as "a public facility that enables cultural and artistic activities" and "a space that has been given to the public" highlight its role in democratizing access to art and heritage.



Figure 2. LDA Terms Distributions for the Topic "Institutional Representation and Public Appreciation"- overall frequency (left), saliency (centre), and distinctiveness (right)

However, this positive narrative also reveals a strategic framework of institutional representation. The repeated references to İBB and Ekrem İmamoğlu suggest a discursive correlation between the site's success and a particular institutional identity. The keywords "İBB," "Ekrem," "project," "work," and "contribute" establish the transformation as a municipal achievement. However, the limited visibility of grassroots actors, such as neighbourhood associations and volunteer groups, suggests a discursive asymmetry. The absence of actors such as the Gazhane Environmental Volunteers Association (*Gazhane Çevre Gönüllüleri Derneği-GÇDD*) in the key metrics further underscores this imbalance.

This tension underscores the inherently political nature of public space production. While Gazhane is presented as a space "for everyone," it simultaneously becomes a stage for hegemonic representation. This duality underscores the fact that even physically inclusive spaces may entail representational inequalities. In the case of Gazhane, this contradiction reflects the tension between institutional strategies of legitimacy and the risk of

functions. Gazhane's integration of cultural capital with daily urban practices offers an innovative model of contemporary public space, exemplifying the evolving logic of urban commons in the 21st-century city.

4.4 Democratic Access and Spatial Constraints

This topic reflects the dual role of Museum Gazhane as both a vibrant cultural hub and a space marked by infrastructural tensions. The success of the site in fostering artistic engagement and social interaction is counterbalanced by the challenges posed by overcrowding and spatial limitations. The Gazhane's strategic positioning of itself as a central cultural hub is further reinforced using prominent and salient terms such as "event," "concert," "activity," "free," "atmosphere," and "pleasant." However, distinctiveness metrics reveal a paradox at the heart of its popularity: while the space is celebrated as a dynamic leisure destination, its physical configuration often struggles to accommodate peak demand (Figure 4).

Gazhane's cultural offerings have been the subject of consistent praise in user comments, with users expressing appreciation for the open and inclusive nature of these offerings. The recurrence of terms such as "concert," "theatre," and "free" reflects users' appreciation of its democratizing role in expanding access to the arts. Concurrently, the lexical clusters "atmosphere," "pleasant," "good," "easy," "weekend," "fun," and "locations" serve as indicators of the site's efficacy in engendering an emotionally resonant spatial experience. These associations indicate that Gazhane is not only prized for its high-attendance events, but also for its capacity to host everyday leisure practices such as casual strolls, rest, and informal socializing.



Figure 4. LDA Terms Distributions for the Topic "Democratic Access and Spatial Constraints"- overall frequency (left), saliency (centre), and distinctiveness (right)

However, the co-occurrence of terms such as "crowded" and "tiring" alongside celebratory expressions such as "energy" and "enjoyable" reveals an underlying tension between vibrancy and comfort. While users frequently acknowledge the richness of the programming, they also often offer critiques of the logistical shortcomings that detract from their experience. These critiques posit that Gazhane's spatial design does not always align with the intensity and frequency of its event-based usage. The temporal clustering of events, particularly during weekends and evenings, exerts a significant strain on the space's carrying capacity, thereby highlighting the fragility of the existing infrastructural model. Therefore, there is an urgent need for adaptive systems.

When considered collectively, this thematic cluster positions the Museum Gazhane as an evolving urban gathering space that responds to contemporary needs for cultural enrichment, entertainment, relaxation, and self-expression. The event-oriented model under discussion here illustrates the potential of public spaces to facilitate collective enjoyment and cultural democratization. However, infrastructural constraints—including limited seating, bottlenecks, and overcrowding—also reveal the delicate balance between inclusive access and spatial comfort. In doing so, this topic foregrounds a pivotal challenge in contemporary public space design: the challenge of sustaining high levels of utilization without compromising the very experience that such utilization is intended to enhance.

4.5 Civic Provision and Commercial Use

This topic posits that Museum Gazhane functions as a hybrid public infrastructure, wherein municipal services and commercial amenities converge to create a space that extends beyond conventional cultural programming.

Table 1. Thematic alignment of LDA topics with the roles of public space

Thematic Cluster (LDA Topics)	Symbolic Roles			Social Roles			Physical Roles			Political Roles			Economic Roles		
Symbolic and historical transformation															
Institutional representation and public appreciation															
Multifunctionality and everyday engagement															
Democratic access and spatial constraints															
Civic provision and commercial use															

Rather than mapping neatly onto singular functions, each topic intersects with multiple conceptual roles of public spaces. This multidimensionality illustrates how users' spatial meanings emerge through the interplay of design, discourse, use, and governance.

Table 1 aligns each thematic cluster with the five foundational roles of public space identified in the theoretical framework. This evaluative mapping, based on keyword saliency and interpretive readings, underscores the dialectical relationship between institutional narratives and everyday spatial experiences. It affirms that public space is continuously shaped as a negotiated, dynamic construct.

5. Conclusion

This study examined how users experience, interpret, and represent the Museum Gazhane as a contemporary public space. A two-phase methodology was used to analyse 3,025 Google Maps reviews. First, Latent Dirichlet Allocation (LDA) topic modeling was employed to identify prevalent themes. Second, critical discourse analysis (CDA) was employed to interpret these themes and reveal the social meanings, tensions, and symbolic associations embedded in user narratives.

The five thematic clusters identified—ranging from historical symbolism and institutional representation to multifunctionality and civic-commercial hybridity—reveal how users attach affective, political, and experiential meanings to the space. These representations are shaped by physical conditions and broader discursive dynamics, including municipal visibility, public participation, and market-driven governance. This approach confirms that public perception is not monolithic but rather formed through multiple—and sometimes conflicting—narratives. Representations in user reviews reflect personal encounters and socio-spatial imaginaries, demonstrating that public spaces are produced through the interplay of institutional structures and everyday experiences.

This study makes multifaceted contributions to public space research at the theoretical and methodological levels. First, it provides a comprehensive analytical framework for using user-generated digital content to analyse the experiential and symbolic meanings of public spaces. In this regard, the study proposes an innovative approach that integrates critical space theories, which posit that public spaces are constructed through discourse, with digital data analysis.

The study makes a theoretical contribution by proposing a multi-layered understanding of how public spaces are produced. It posits that user comments serve as indicators of satisfaction and as sources of representations related to abstract values, such as social memory, cultural identity, and spatial justice. The proposed theoretical framework has five dimensions representing the traditional roles of public spaces, thereby establishing a critical and applicable theoretical foundation. As illustrated in Table 1, these five dimensions are closely related to the conceptual framework of the symbolic, social, physical, political, and economic roles of public spaces. Rather than being considered separately, these roles reflect hybrid intersections that confirm the theoretical premise

that public spaces are relational and contested structures. This perspective emphasizes that the meaning of public space emerges through the interplay of institutional narratives and user experiences.

Methodologically, this study shows how combining computational and qualitative approaches can capture complex, digitally mediated spatial meanings. Integrating Latent Dirichlet Allocation (LDA) with Critical Discourse Analysis (CDA) shows how statistical pattern detection can be meaningfully enriched through context-sensitive, theoretically informed interpretation. CDA plays a central role in revealing how public spaces are constructed through discourse by users—not just described, but also symbolically and ideologically framed through everyday language. This model illustrates the potential of integrating digital methodologies with critical social sciences in public space research. Although user-generated content provides scalable, real-time insights, limitations such as digital exclusion and representational bias must be addressed through reflexive interpretation and methodological pluralism.

In practice, this study highlights the importance of incorporating user perspectives into the design, management, and repurposing of public spaces. It demonstrates the potential of an alternative data source for planning practices and offers a structured approach for its integration. Analysing users' experiences and perceptions can contribute to developing strategies that enhance spatial sustainability, social inclusion, and social belonging.

In sum, this study contributes conceptually, methodologically, and practically to the evolving field of public space research. It shows that user-generated narratives are active sites of meaning-making, not just reflections of use. Future research may expand upon this approach through longitudinal and comparative analyses, multi-platform data integration, or integration with ethnographic methods to further explore how publicness is imagined, practiced, and contested in contemporary cities.

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