The Journal of Public Space
ISSN 2206-9658
2025 | Vol. 10 n. 2
https://www.journalpublicspace.org

Futurible Heterotopias of Phygital Spectacle.
Understanding How Digital Technologies Intensify Spatial Segregation in Quasi-Public Commercial Centres

Yiwei Ou, Manfredo Manfredini
The University of Auckland, New Zealand
you661@aucklanduni.ac.nz | m.manfredini@auckland.ac.nz

Abstract
In contemporary cities, the disruption caused by new consumption practices, most notably e-commerce, has intensified the creative destruction of shopping environments. A prominent reinvention of the extra-ordinary experience offered by hyper-consumption centres involves the *phygital* (physical + digital) augmentation of spectacle leveraging multireality and interaction technologies. This reinvention catalyses translocal, multilevel and asynchronous sociospatial interactions, challenging the inherent city-antagonist logic of these centres by seemingly removing their enclavic character. By transcending the quartering barriers of complicit self-segregation that characterise their function as Foucauldian *heterotopia of compensation and illusion*, they reassociate the highly fragmented space, culture and society of our cities. This article analyses the effectiveness of the city-antagonism reversal by reintegrating and repoliticising quasi-public space or, as suggested by Foucault's genealogy theory, cunningly remodulating its insular functions. Through an empirical investigation of a prominent shopping centre - Beijing's SKP-S - featured with advanced phygital spectacles, this study analyses both people-to-people and people-to-space interactions. The methodology combines behavioural observation with a multidimensional social media analysis of 8,827 Weibo posts from 5,392 users spanning 2019-2024, including an expedited computer vision classification of visitor-generated images. It examines posting patterns, engagement metrics, and content characteristics. Findings indicate that the subversion of the city-antagonist heterotopian character is only apparent: while digital technologies introduce new compensatory functions that promote digital social engagement, and new illusory functions that enhance the spectacular potential to foster the collective imagination of positive possible futures, these innovations deploy new mechanisms of socio-spatial control that intensify, rather than diminish their segregative capacity. Instead of de-privatising urban experiences, advanced *phygitalisation* enables commercial spaces to further colonise private social relationships through social media sharing practices; it exacerbates the contradictions intrinsic to these compensatory spaces, which - as per Foucault - are "as perfect, as meticulous, as well arranged as ours is disorderly, ill construed and sketchy."

Keywords: digital technologies, AI, heterotopias, shopping malls, social media analysis

To cite this article:
Ou, Y. and Manfredini, M. (2025) "Futurible Heterotopias of Phygital Spectacle: Understanding How Digital Technologies Intensify Spatial Segregation in Quasi-Public Commercial Centres", The Journal of Public Space, 10(2), pp. 47-76. doi: 10.32891/jps.v10i2.1882.

This article has been double blind peer reviewed and accepted for publication in *The Journal of Public Space*.

This work is licensed under a Creative Commons Attribution - Non Commercial 4.0 International License https://creativecommons.org/licenses/by-nc/4.0/

1 Introduction

Shopping environments have become increasingly important (quasi-)public spaces in contemporary urban daily life. As cities become more fragmented and segregated (Healey, 2020; Marcuse, 2005), these environments hegemonise people's instances of togetherness and sharing urban resources, catalysing community potentials and city socio-spatial polarisation (Crawford, 1992; Ou & Manfredini, 2020). However, due to the extra-ordinary character of their theatrical environments and performances, critics have argued that they function as modern city-antagonist Foucauldian heterotopias of compensation and illusion: spaces that segregate people spatially and socially, dominating their daily urban experiences (Foucault, 2008 [1967]; Muzzio & Muzzio-Rentas, 2008; Shane, 2008; Dehaene & De Cauter, 2008; Roux et al., 2018).

The disruption caused by new consumption practices, most notably e-commerce, has intensified the creative destruction of their environments (Schumpeter, 2003 [1942]; Rigby, 2011; Reinartz et al., 2019). A prominent reinvention of the extraordinary experience offered in their spaces involves the digital augmentation of their spectacle through interactive, extended and multiple realities both in expression and communication (Manfredini, 2017, 2020; Ou, 2021). On the one hand, they present themes, scenes and objects that use transduction means to offer translocal and trans-chronic experiences. On the other hand, they facilitate both synchronic and diachronic social engagement through digital social networks that remove the barriers between the enclave and the spaces, cultures, and societies, exceeding them. This new mode of spectacle catalyses translocal, multilevel and asynchronous sociospatial interactions, challenging the inherent logic of heterotopian quartering and complicit self-segregation (Ou & Manfredini, 2022; Yunus & Akhtar, 2025).

1.1 The Influences of Digital Technologies on Malls' Spatial Performances

The rapid development of digital technologies has significantly transformed people's everyday lives and reshaped perceptions of space. In "Code/Space", Rob Kitchin and Martin Dodge (2011) argue that spatial transduction introduces emerging qualities that mobilise space and time, reconfiguring relations between people and contexts. Digital technologies play an essential role in this dynamic process by offering new instruments for modulating perception, action and interaction, influencing the behaviours and practices in situated contexts.

Contemporary shopping centres are increasingly equipped with advanced digital technologies, including virtual reality (VR), augmented reality (AR), and augmented virtuality (AV). These technologies employ various embodiment modes, offering visitors ever-changing impressions that infuse spatial experiences with play and amusement. Particularly notable are AR games, which allow individuals to use their smartphone functions to participate in group activities, thereby improving interactions both between people and between them and the environment.

Shopping environments continue to innovate in their use of digital technologies. An exemplary case is Beijing SKP-S—a themed hyper-consumption centre populated by digital apparatuses that articulate these technologies in a futuristic "post-human" condition. Although the post-human condition is minimally elaborated, its manifestations are powerfully presented through a tightly woven narrative sequence of highly evocative, experiential, and futurible *phygital* (physical + digital) atmospheres. The spectacle capacity of cutting-edge technology is leveraged to produce engaging, surreal,

animated installations with active humanoid and more-than-humanoid robots, immersive high-tech displays, and sensors that respond to bodily movements or smartphone inputs, rendering scenes and actors dynamic and eventful. In this context, shopping practices shift from passive visitation into active participation, encouraging translocal, multilevel and asynchronous sociospatial behaviours primarily mediated by social media. These digitally driven experiences profoundly influence how commercial centres are inhabited and negotiated by the public, enabling new forms of engagement with both spaces and people, within and beyond the physical enclaves.

1.2 Research Gaps, Methodological Considerations, and Research Question

Despite the apparent transformation of enclavic hyper-consumption spatialities through digital augmentation, critical questions remain about whether these technological interventions genuinely subvert the heterotopian character of commercial centres or merely enhance their segregative capacity through more sophisticated means. While existing literature acknowledges the potential of digital technologies to foster social action and interactions (Boy & Uitermark, 2023; Gerbaudo, 2012; Manfredini, 2017; Ou & Manfredini, 2022), there is limited empirical investigation into how these activities actually unfold in practice in hyper-consumption enclaves and what their implications for public space dynamics are.

Furthermore, the analysis of digitally augmented quasi-public spaces requires methodological approaches that can capture both behavioural patterns and the broader social reception of their technological augmentations. The proliferation of social media platforms and their growing role in consumption practices provide unprecedented opportunities to examine them through user-generated content, offering insights into how digital technologies mediate the relationship between commercial spaces and urban public life.

This research addresses these gaps by conducting a comprehensive case study analysis that combines behavioural observation with social media data analysis to examine the actual impact of digital technologies on hyper-consumption spatialities. Through this approach, we aim to shed light on the effectiveness of the seeming reversal of heterotopian emplacements' city-antagonist character.

To understand whether the experience-driven hyper-consumption enclaves, where digital technologies foster translocal, multilevel and asynchronous sociospatial interactions, have produced novel *creative destruction* models, this paper proposes the following research question: *How does the deployment of digitally augmented spectacle in contemporary commercial enclaves either subvert or remodulate their foundational city-antagonist logic, and—if the latter—through what mechanisms do digital technologies simultaneously foster social engagement and shared imagination while intensifying segregative capacity?*

2 Methodology

To address the research question, this paper takes both theoretical and empirical approaches to investigate the effects of digital technologies on the spatialities of Foucauldian heterotopias in ultra-modern malls. First, it adopts a theoretical framework to examine how digital technologies have transformed the spatial performances of ultra-modern malls and people's perceptions and behaviours in malls in the mobile internet

era. Then, this research analyses the reception of such a transformation by conducting a single case study on a new mall that prominently adopts advanced digital technologies, the Hualian Group's SKP-S Beijing Mall, examining both *people-to-people* and *people-to-space* interactions.

The analysis of physical *people-to-people* interaction was conducted through behavioural investigations during multiple field visits, encompassing both weekday and weekend periods and different times of day - including morning, afternoon, and peak evening hours - in order to capture variation in visitor activity patterns and crowd composition. During each visit, observations focused on how visitors engaged with the mall's digital installations: the types of social behaviours these installations elicited (group gathering, photography, directed movement through themed zones), the extent to which digitally augmented spaces concentrated or dispersed visitor attention, and the observable differences in visitor engagement between themed installation zones and conventional retail areas. The findings are primarily qualitative and contextual in character, serving to ground and complement the quantitative social media data analysis.

The investigation of digital *people-to-space* interaction was conducted through the analysis of social media data crowdsourced on Weibo, which is a dominant social media platform in China. A total of 8,827 public Weibo posts created by 5,392 unique users between 2019 and 2024 were collected using the hashtag "#Beijing SKP-S". In addition to post-level data (text content, timestamps, engagement metrics, image counts, hashtags, and mentions), user profile data was also systematically collected. Profile variables include self-reported gender, birthdate, IP location, Weibo account registration date, and verification status. This supplementary user profile dataset is used in Section 4.5 to provide a preliminary demographic contextualisation of the social media sample, addressing the representativeness concerns that are inherent to social media-based spatial research.

Furthermore, this study incorporates an expedited computer vision classification of visitor-generated images extracted from the Weibo dataset. A total of 9,176 images were retained following a de-advertising filtering procedure that excluded brand-promotional and influencer-marketing content from the raw image pool. At this stage, images were classified into interior and exterior spaces, providing a quantitative spatial content analysis to complement the text-based social media analysis. The results are reported in Section 4.6.

3 Theoretical Underpinnings

This research primarily draws on Kitchin and Dodge's (2011) "spatial transduction" and Coyne's (2010) "tuning of place" theories to investigate the effects of digital technologies on the spatial performance of malls, examining how the mobile internet and digital instruments have transformed public perceptions and behaviours in ultra-modern malls in the digital age.

3.1 Spatial Transduction: Determination and Augmentation of the Spatialities of Physical Spaces in Malls

The theory of "spatial transduction" proposes that the spatiality of physical space can be transduced by various forms of shifts in contexts, especially software and digital technologies (Kitchin & Dodge, 2011, p. 69). These technologies are important because

they alter the conditions through which society, space, time, and thus spatiality, are produced (Kitchin & Dodge, 2011). It discusses how software creates new spatialities of everyday life through a process of transduction, providing a distinct understanding of spatiality that conceives the world as ontogenetic in formulation. It argues that the spatialities of everyday life unfold in diverse ways through the mutual constitution of digital technologies and sociospatial practices (Kitchin & Dodge, 2011). The relationships between them can be divided into two types: code/space and coded space. In the former case, the spatiality is determined and constituted by software or digital technologies, while in the latter situation, the spatiality is augmented by the technologies.

Ultra-modern malls usually contain code/space and coded space simultaneously. Their spatial performances are both determined and augmented by digital technologies and mobile internet. As places of commercial stores, their spatialities are generally determined by digital technologies, for nowadays, payments are mainly processed with electronic systems and digital software. While malls serve as places of social communities and entertainment, their spatialities are often augmented by digital technologies and the mobile internet, which facilitate people's social interactions and amusement. This augmentation of malls' spatial performance as social communities is crucial in the digital age, as contemporary citizens increasingly visit malls as a form of social activity rather than primarily for buying goods or services (Manfredini & Jenner, 2015; Manfredini, 2017). These digital technologies, including the navigation system and surveillance cameras, can help enhance malls' spatialities considerably. For example, a digital navigation system with Mixed Reality (MR) technologies can facilitate social encounters in large shopping environments, supporting social interactions in the city. Critically, the multimodal and pervasive digital surveillance can provide very powerful control and discipline of people's behaviours. On the one hand, this offers a strong sense of security, especially for vulnerable groups. On the other hand, it may also constitute new forms of socio-spatial segregation that, as noted by Kitchin and Dodge (2011, p. 11), operate through seemingly benign technological augmentation that enable hegemonic forces to constantly and recursively produce new forms of space, subjectivity, and social order.

3.2 Tuning of Place: Tuning of People's Social Relations and Perception of Spaces in Ultra-Modern Malls

Coyne (2010) proposes the theory of "tuning of place" in the book *The Tuning of Place: Sociable Spaces and Pervasive Digital Media* to study the influence of mobile internet and digital technologies on people's social interactions and perceptions of physical spaces. He borrows the concept of the tuning process of musical instruments to understand how people adjust their interactions with others and with the places they occupy (Coyne, 2010). The theory provides a fundamentally different perspective to examine how digital technologies are integrated into people's everyday lives and the social realm. It argues that pervasive digital media can help to formulate a sense of place through their capacity to introduce small changes, in the same way that tuning a musical instrument invokes the subtle process of recalibration (Coyne, 2010). These small-scale changes are important in the creation of environments, and there is a strong social aspect to that place-making. Ubiquitous digital devices and mobile internet are tools for social interaction, and the tuning of place is also the tuning of social relations (Coyne,

2010). It emphasises the subjective initiative in people's interactions with others and the surrounding environment. In shopping malls, digital devices, such as electronic advertising screens, interactive digital machines, and pervasive digital surveillance cameras, may stimulate people's desire to consume, promote social interactions with others, and discipline customers to behave well in the malls. These are all possible reactions due to the changes in their perception of spaces. So, the changes of digital devices in malls' spaces are closely related to the changes of people's perception of space and their behaviours in malls, and it involves opportunities for closer social relations in this process.

With the development of artificial intelligence (AI) and human-machine interaction techniques, some intelligent shopping guide robots have been produced and used in malls' physical spaces in recent years. For example, Figure 1 shows an interactive robot at the ID shopping mall in Changsha City, China, which has essential artificial intelligence abilities and can interact with people to provide services. This digital equipment with a dynamic algorithm in hyper-consumption environments challenges people's traditional perception of the physical spaces. Yet, while it can provide people with customised and memorable experiences (Pine & Gilmore, 1998) and personal "tunability" of places and atmospheres by making the multiple experiential layers modifiable and adjustable to individual needs and preferences, it also deepens the exposure to colonisation of both the public and private spheres through algorithm controlled processes (Coyne, 2010; Manfredini, 2019b, 2022).



Figure 1. The intelligent shopping guide robot in Changsha ID Mall. Source: Authors.

3.3 Defining Genuine Public Space

Drawing on our previous work (Manfredini, 2017, 2019a, 2019b; Ou, 2021), a recurring concept in this paper is that of *genuine public space*, which requires brief theoretical clarification before the empirical analysis proceeds. This concept draws on Crawford's (1992) foundational critique of the shopping mall as a privatised simulacrum of urban life, Dehaene and De Cauter's (2008) analysis of heterotopia in post-civil society, and

Voyce's (2006) argument regarding the displacement of civic participation by "consumerist citizenship", *genuine public space* is understood in this paper as space characterised by the following properties: unrestricted accessibility regardless of socioeconomic status or consumer intent; absence of systematic commercial ownership, control, and behavioural surveillance; and the presence of conditions that are open to unmediated social encounter, political expression, and forms of collective life that are not instrumentalised by commercial objectives.

This understanding does not imply that genuine public space is free of power relations, conflict, or exclusion—it is not, and critical urban theory has extensively documented the ways in which ostensibly public spaces reproduce social inequalities through design, policing, and convention (Dehaene & De Cauter, 2008). Rather, the concept designates a normative standard against which the quasi-public commercial environments under analysis are measured: environments where the simulation of publicness—openness, gathering, social activity—coexists with, and ultimately serves, the structural logics of private commercial ownership, spectacle-driven attraction, and consumer segmentation. It is this contradiction between the apparent and the structural that the concept of "augmented heterotopia" is intended to capture: a spatial formation in which digital technologies simultaneously appear to dissolve enclavic boundaries while introducing new, more subtle mechanisms of socio-spatial control that intensify the segregative capacity of commercial space.

4 Case Study and Results

Based on the theoretical framework, this paper conducts an empirical case study of the Beijing SKP-S mall to investigate the spatialities of malls in the digital age. Opened in 2019, SKP-S represents one of China's most technologically advanced luxury shopping destinations, distinguished by its extensive integration of digital technologies and immersive spatial experiences. It ranked first place in the annual sales list of all the malls in China in 2021, with a revenue of 24 billion RMB, which rose by over 35% compared with 2020, even during the COVID-19 pandemic period (Real Estate and Business, 2022). The mall is an experiential place themed with "future human life on Mars", providing people with an immersive "science-fiction world" shopping environment with many new digital technologies. Its innovative approach to combining retail, entertainment, and digital augmentation makes it an exemplary case for examining the new spatial performances of ultra-modern commercial centres in the digital era.

4.1 Introduction to Beijing SKP-S Shopping Mall

Beijing SKP-S (Shin Kong Place South pavilion) is an upscale luxury shopping mall featuring the theme of "digital-analogue future," which encourages visitors to imagine future human life on Mars following technological advancement. The mall offers customers innovative shopping experiences through spatial performances augmented by digital technologies. With numerous theatrical installations, SKP-S presents futuristic scenarios where technological progress enables humanity to blur boundaries between human and digital realms. Designed as an art gallery-style destination, the mall represents a pioneering experiment that combines retail commerce with artistic installation, digital technology, and thematic storytelling, fundamentally challenging the spatial conventions of traditional shopping centres (Ding & Guo, 2023).

4.2 Immersive Spatial Experiences Augmented by Digital Technologies

Beijing SKP-S has a distinct and attractive theme that would bring people's curiosity about "where the future world will go" and "what mankind will pursue". The mall's spaces tell a complete story about the "immigrating to Mars" activity a hundred years later. As people enter the mall, they are welcomed by a non-commercial space featuring expansive digital art installations with the theme of "future farm", which gives people an instant sense of being transported into another world. Indeed, the mall sets different sub-themes in each of the four levels under the general stories: Terra (1F), Explorer (2F), Discovery (3F) and Endeavour (4F). Each level's spaces are equipped with various digital devices to enhance people's illusions of the themed spaces, turning people's shopping experiences into immersive spatial experiences that guide them to explore and discover the extraordinary adventures of the journey from Earth to Mars. To offer more realistic senses of future scenes to citizens, it uses digital technologies to engage people's four senses of visual, auditory, olfactory, and tactile feelings, providing people with highly immersive experiences. In the mall, the entrance exhibition spaces with digital and mechanical sheep, as shown in Figure 2 (left), provide people with both visual scenes and smells produced by the dust and grasses. Moreover, the lobby placed on the third floor with two digital intelligent robots who are moving and talking with each other, as shown in Figure 2 (right), gives people direct audio impressions and potential tactile feelings as people are allowed to touch the robots' clothes, hair and skin.

Apart from the open spaces for social interactions and entertainment, the commercial spaces of malls are also augmented by digital technologies. For example, the stores that sell beauty commodities use large electronic televisions and digital mechanical installations (Figure 3) to attract people into the shops and provide them with immersive themed experiences that are coherent with the general stories of the mall. In this way, the mall turns the traditionally functional activities of shopping into an exciting adventure for customers to explore.

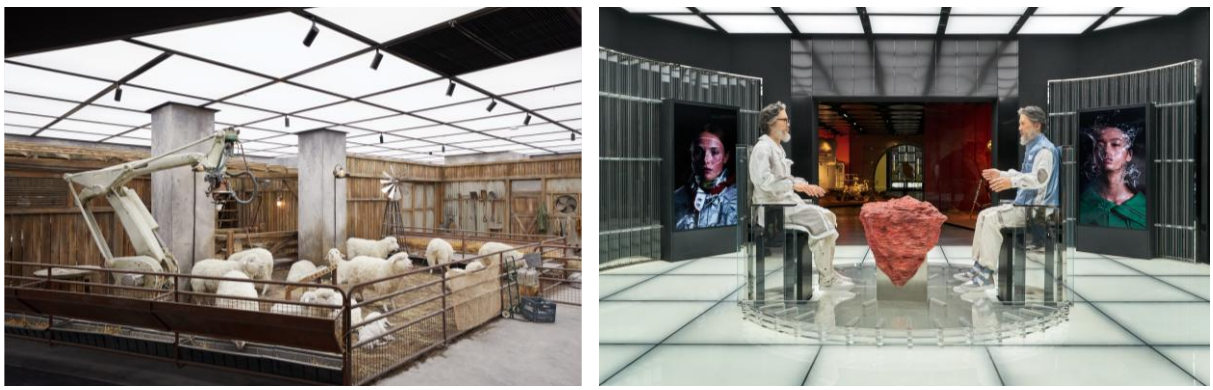


Figure 2. The entrance exhibition spaces with mechanical sheep (left) and the biomimetic digital robots on the third floor of SKP-S (right). Source: Authors.

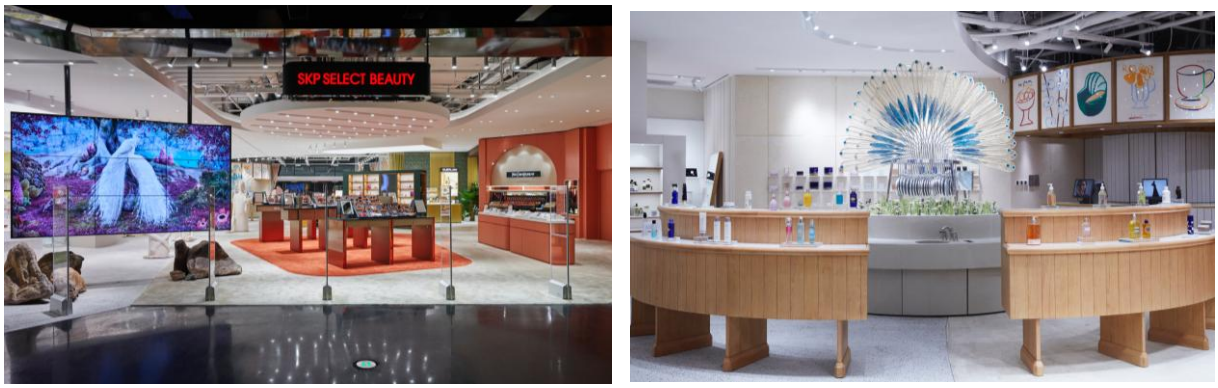


Figure 3. The commercial spaces with digital technologies in SKP-S. (Source: Authors)

4.3 Interactions between People and Space Enhanced by Digital Technologies

In Beijing SKP-S mall, the ubiquitous digital devices not only augment the mall's spatial performances through spatial transduction but also activate the social interactions between people and the mall's spaces by tuning people's perception of spaces. The mall sets various digital devices in its physical spaces to provide a magical and enjoyable environment for people to communicate socially with others. For example, it designed a magical tunnel environment that creates visual illusions by reflecting the lights (left in Figure 4) and an open place with interactive digital penguins that can react to people's movements in front of them (right in Figure 4). These digital technologies can attract people to interact with the mall's spaces and encourage them to make social communications with other visitors.



Figure 4. The interior tunnel that creates visual illusions with reflections and interactive digital penguins that mirror people's movements in Beijing SKP-S mall. (Source: Authors)

4.4 Social Interactions between People and People Within and Outside the Mall

In addition to the augmented interactions between people and space in the mall induced by the digital technologies and mobile internet that synchronise multiple realities with interactive XR (Extended Reality) events, games and scenes, malls' illusory functions with these spectacular scenes also provide infrastructures and materials facilitating

communication between people and people within and outside the mall through various social media and online review platforms. For example, on the popular text-and-images-based social media Weibo, the "SKP-S" themed posts have been reviewed for more than 43 million times in total with more than 15 thousand comments (left in Figure 5), while on the popular video-based social media Tiktok, the videos themed with the topic of "Beijing SKP-S shopping mall" have been played for more than 180 million times (middle in Figure 5). Moreover, on the popular online review platform, Dazhong Dianping, the number of public posts of reviews and comments on the Beijing SKP-S shopping mall are more than 6900 in total (right in Figure 5). Dazhong Dianping is the most popular online review website in China, and it enables customers to share their comments on the shopping and spatial experiences of malls via texts, photos, and videos. The massive number of posts on Weibo, TikTok and Dazhong Dianping indicates that Beijing SKP-S mall is an active urban centre, where lots of people are sharing their experiences with people within and outside the mall, augmenting people's engagement with friends and the wider public.

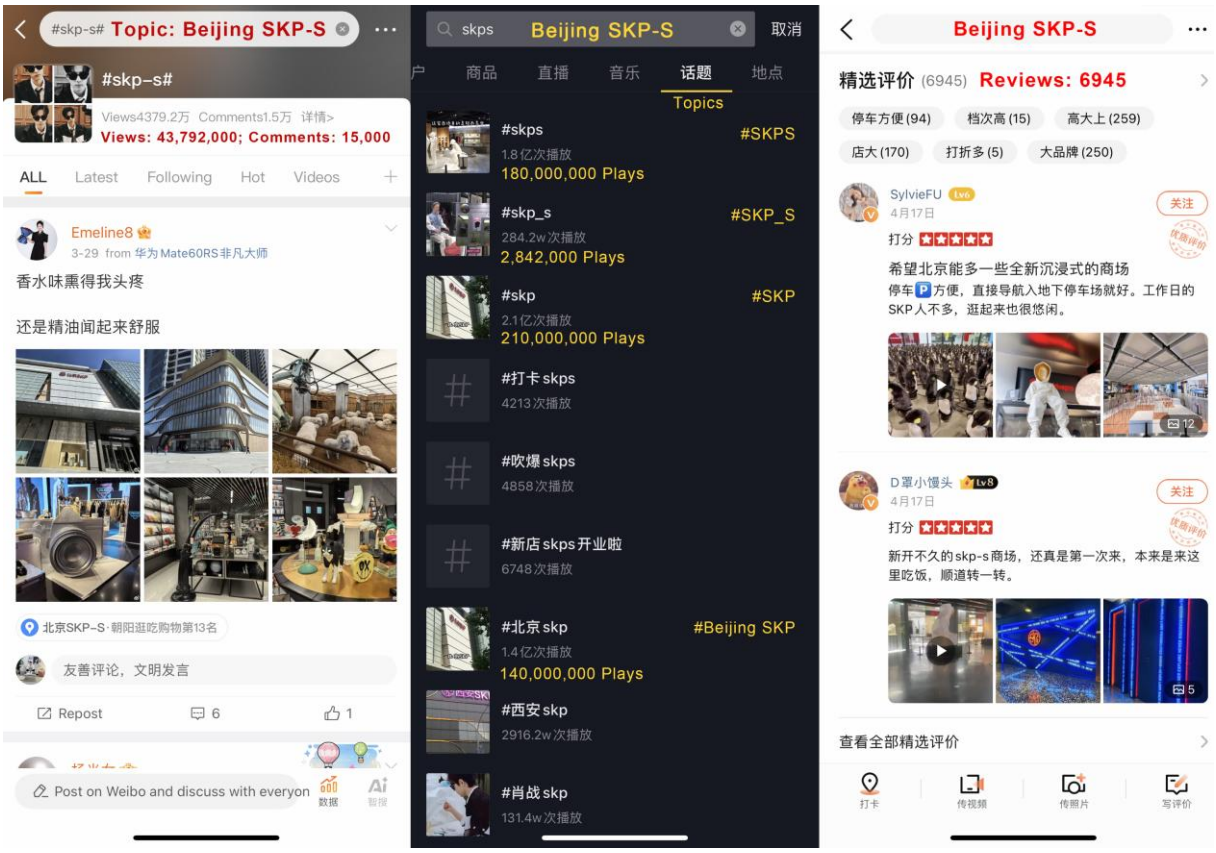


Figure 5. The online discussion and social interaction about the Beijing SKP-S mall on social media Weibo, TikTok and review platform Dazhong Dianping. (Source: Authors)

Notably, such posts people share online are usually themed with the hyper-real scenes in the mall that are augmented with advanced digital technologies (Figure 6). These illusory hyper-real spaces embody exquisite and novel spatial spectacles in the mall, offering highly unique spatial experiences to visitors that are totally different from their

previous experiences in other conventional malls. These spectacular, digitally augmented illusory places are gradually becoming landmark spaces in the mall, attracting many people to be there and share their experiences on social media with friends and the wider public. In other words, these digital technologies improve the "Instagrammability" of the mall's spaces in the city (Churchill, 2022; Degen & Rose, 2024), thereby significantly transforming public perceptions and behaviours.

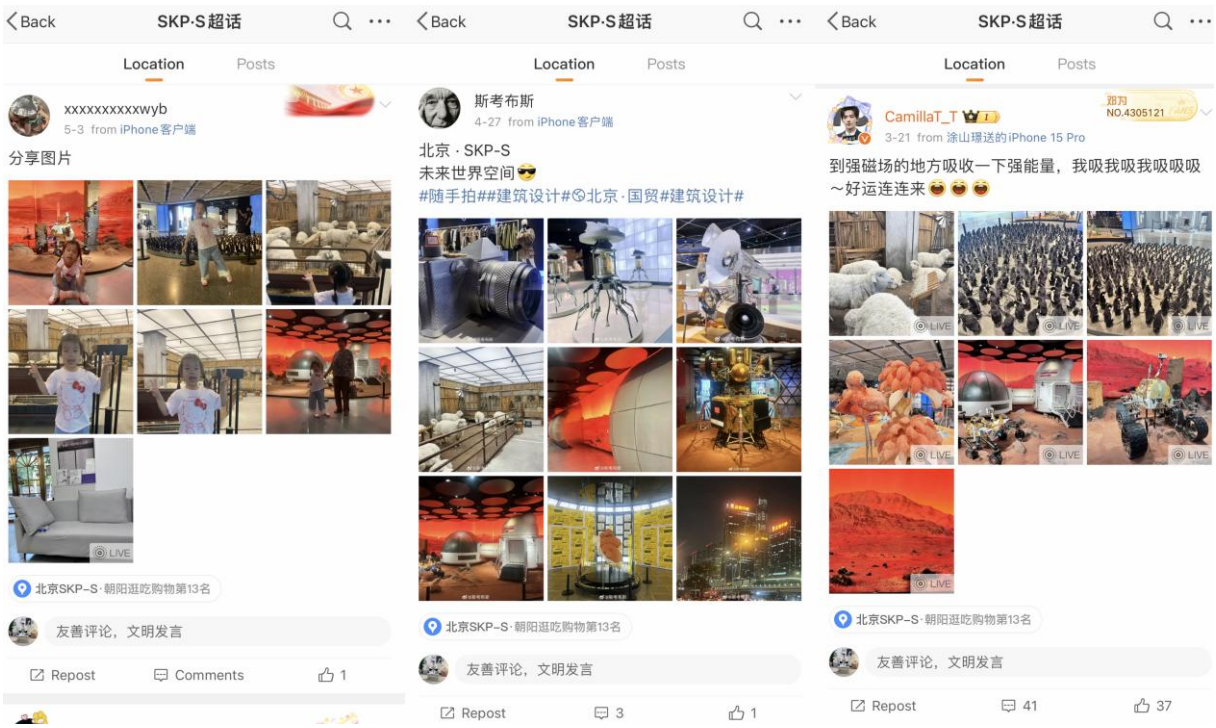


Figure 6. The "SKP-S" related posts on Weibo are usually featured with the mall's hyper-real spectacular spaces that are augmented with digital technologies. (Source: Authors)

4.5 Quantitative Social Media Engagement Patterns

To complement the qualitative analysis of social media content, this study conducted a comprehensive quantitative examination of posting patterns and engagement metrics on Weibo, the largest public social media in China, where SKP-S content predominantly circulates.

4.5.1 Platform Representativeness and User Demographics

Before presenting the results of the social media analysis, it is important to contextualise the Weibo dataset within the broader population context and acknowledge the limitations of platform-specific participation. This section addresses the representativeness of the Weibo-based sample with reference to platform-level demographics, China's broader digital landscape, and the composition of the user community identified in the SKP-S dataset.

China's demographic and digital landscapes provide an important backdrop for contextualising the Weibo dataset. According to the National Bureau of Statistics (2026), China's total population stood at 1,404.89 million as of end-2025, with an

urbanisation rate of 67.89% and a permanent urban population of 953.80 million. This large and increasingly urbanised population base is relevant to interpreting the geographic distribution of Weibo users, discussed further below. With respect to digital connectivity, the China Internet Network Information Centre (CNNIC, 2025) reports that China had approximately 1,108 million internet users as of December 2024, representing a penetration rate of 78.6%, with mobile internet users accounting for 99.7% of this total. Urban internet users numbered 795 million, constituting 71.8% of all netizens. These figures indicate that, within the population most likely to visit a luxury destination such as SKP-S, active smartphone and internet usage is effectively ubiquitous, and the assumption of a broadly mobile-connected visitor base is well supported by available evidence.

With respect to the Weibo platform specifically, official data published by the Weibo Data Centre (2024) reports 587 million monthly active users and 257 million daily active users as of the third quarter of 2024, establishing Weibo as one of China's most widely used social platforms and a significant venue for the documentation and circulation of daily experiences. In terms of demographic composition, Weibo's user base skews substantially towards younger age cohorts: users born in the 1990s constitute approximately 48.5% of the platform's active user base, whilst those born in the 2000s account for a further 30.2%, meaning that users born after 1990 collectively represent approximately 78.7% of Weibo's active population. Female users account for 55% of the platform. Geographically, users concentrated in first-, second-, and third-tier cities collectively account for over 70% of the platform's user base (Sina Weibo Data Centre, 2024). Furthermore, over one-third of Weibo users (33.7%) own smartphones priced above 5,000 RMB, while 23.4% have smartphones valued between 3000 RMB and 4999 RMB, and 26.9% have devices between 2000 RMB and 2999 RMB, indicating a user base that skews towards higher socioeconomic status relative to the Chinese population at large. These platform-level demographics are directly relevant to the present study, given SKP-S's market positioning as a luxury destination catering predominantly to younger, urban, and relatively affluent consumers. The demographic profile of Weibo's active user base thus shows a reasonable degree of alignment with the likely visitor composition of SKP-S, particularly in terms of age and urban residence, which mitigates concerns about platform-specific sampling bias.

In addition to platform-level statistics, a preliminary analysis was conducted on the user profile data collected for 5,723 unique accounts in the SKP-S Weibo dataset, which provides further contextualisation of the users generating posts about SKP-S mall. This analysis examined self-reported gender, IP location, account registration date, and verification status. Firstly, as illustrated in Figure 7a, female users account for 71.0% of posting accounts, whilst male users account for 29.0%–a gender skew considerably more pronounced than the platform-level average. Secondly, in terms of geographic origin (Figure 7b), IP location data are available for 54.5% (3,119) of accounts–the remaining 45.5% (2,604) did not disclose their location. Specifically, among those accounts with recorded IP locations, 80.4% (43.8% of the total, i.e. 2,509 posting accounts) are attributable to provinces other than Beijing, whilst 19.6% (10.7% of the total, i.e. 610 posting accounts) carry Beijing IP addresses. This substantial out-of-city share among users suggests that SKP-S generates significant social media documentation from visitors beyond the local city, consistent with the mall's status as a nationally prominent destination rather than a primarily neighbourhood-serving commercial

centre. Thirdly, analysis of account registration dates (Figure 7c) indicates that 85.6% of posting users had registered their accounts prior to 2019–i.e. before the opening of SKP-S–confirming that the posting population comprises largely established social media participants rather than newly created accounts, which reduces the likelihood that posting activity is primarily driven by promotional behaviour. Finally, 24.9% of accounts carry some form of official verification (Figure 7d), including fashion bloggers, brand accounts, and cultural media operators. Whilst the majority of users (75.1%) are unverified ordinary members, the presence of a verified minority is consistent with the heavy-poster and influencer patterns identified in Section 4.5.3 and reinforces the observation that a small but disproportionately influential segment of the posting community operates in a quasi-commercial promotional capacity.

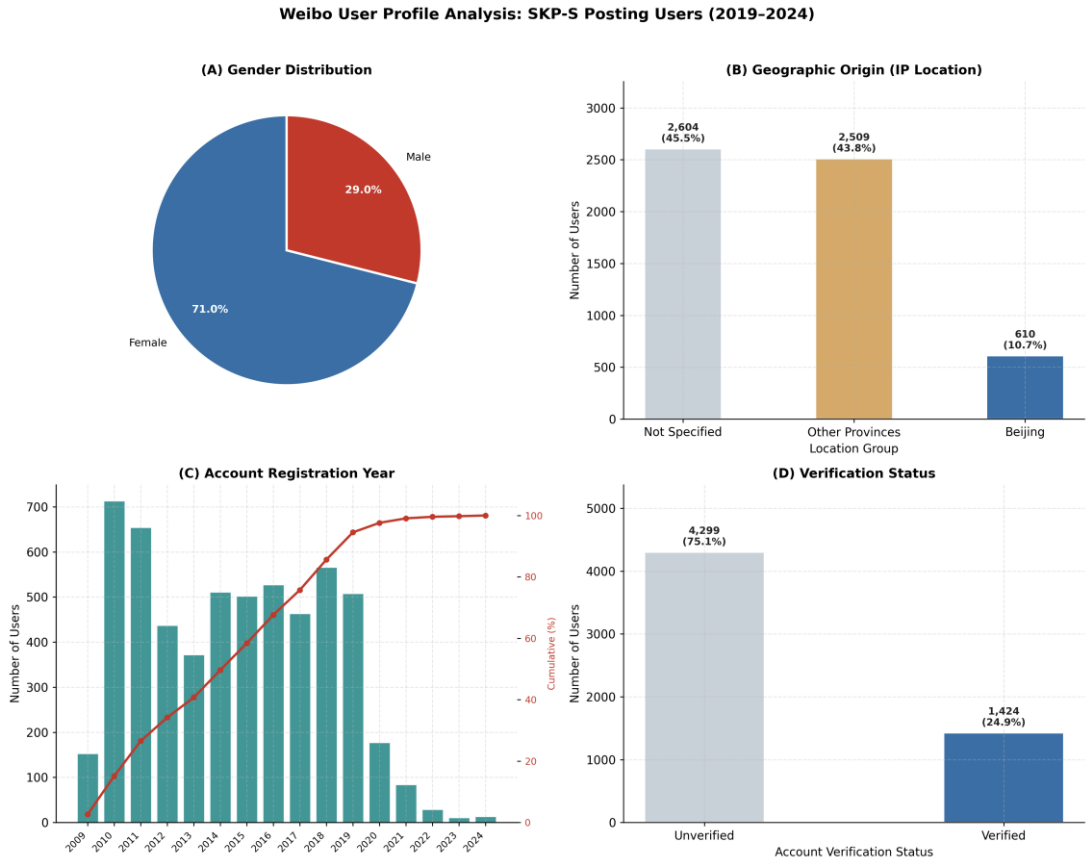


Figure 7. Weibo user profile analysis: gender distribution, geographic origin, account registration year, and verification status of posting users (2019–2024). (Source: Authors)

Moreover, age estimation derived from self-reported birthdate provides an additional layer of demographic validation. As shown in Figure 8, the age of posting users is concentrated in the 19–35 range, with a median age of 28 years and a mean of 29.3 years. This distribution reflects Weibo's platform-level concentration of users born in the 1990s and 2000s, and is broadly consistent with the likely age profile of visitors to a luxury commercial destination like SKP-S. The convergence between platform-level and

the posting population's age distribution provides cross-validation that the SKP-S Weibo dataset, despite its inherent selectivity, does not depart substantially from Weibo's general user profile in its age composition.

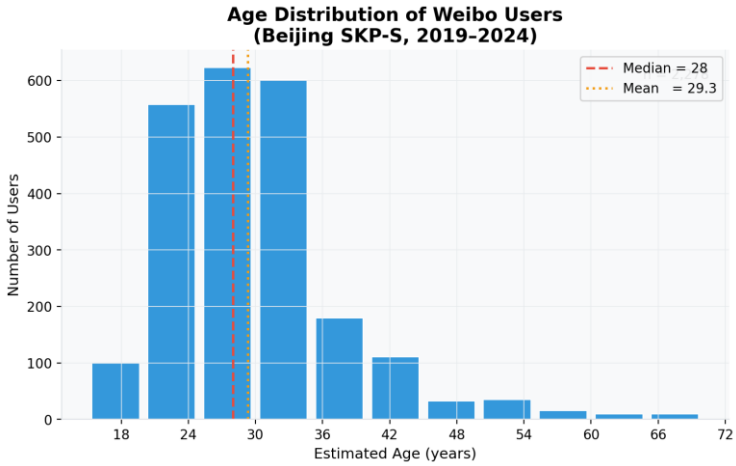


Figure 8. Age distribution of SKP-S Weibo posting users based on self-reported birthdate data (2019–2024). (Source: Authors)

It remains acknowledged, however, that social media users constitute only a subset of all mall visitors: the dataset necessarily reflects the practices of digitally active visitors who choose to share content publicly on this particular platform, and therefore excludes those who visit without engaging in social media documentation, those who prefer sharing via other platforms and older or less digitally engaged visitors whose spatial practices and experiences may differ qualitatively from those captured in the present dataset. The implications of this selection bias for the interpretation of findings are discussed further in Section 7.1.

4.5.2 Content Volume and Temporal Patterns

We collected 8,827 public Weibo posts created by 5,392 unique users between 2019 and 2024 using the hashtag "#Beijing SKP-S". Analysis of posting frequency reveals distinct temporal patterns in social media engagement with SKP-S. Peak posting activity occurs during weekend periods (Friday-Sunday), accounting for approximately 59% of total content volume, as demonstrated in the histogram in Figure 9 (left). This pattern aligns with the mall's function as a leisure and entertainment destination rather than a utilitarian shopping venue, supporting the argument that digital technologies transform commercial spaces into entertainment-focused social environments. The analysis period of 1,855 days shows an average of 6.38 posts per day, with significant temporal variation. Time period distribution analysis demonstrates heightened social media activity during after-work hours, including afternoon, evening, and night periods, which account for 71.1% of daily Weibo posts, according to the pie chart in Figure 9 (right).

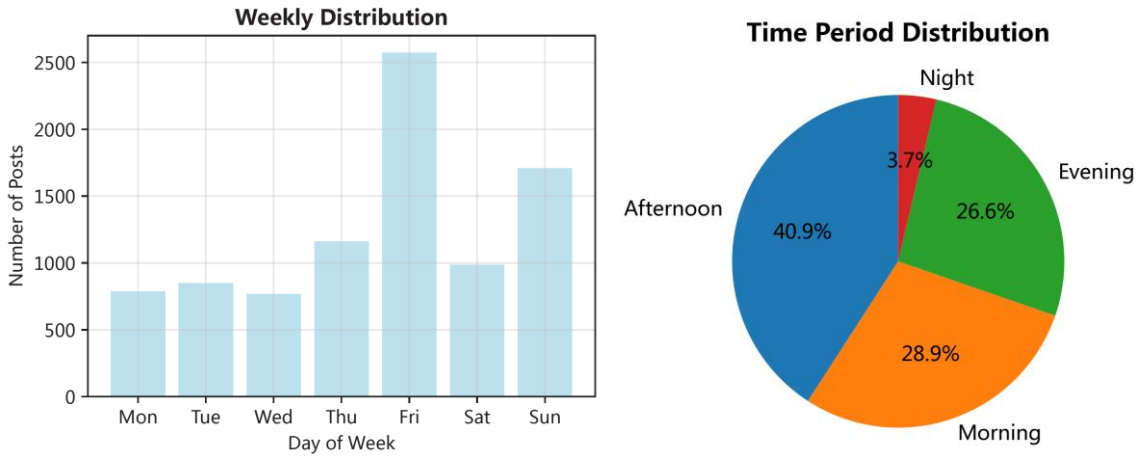


Figure 9. Temporal distribution patterns of SKP-S Weibo posts: weekly distribution across seven days (left) and hourly distribution throughout the day (right). (Source: Authors)

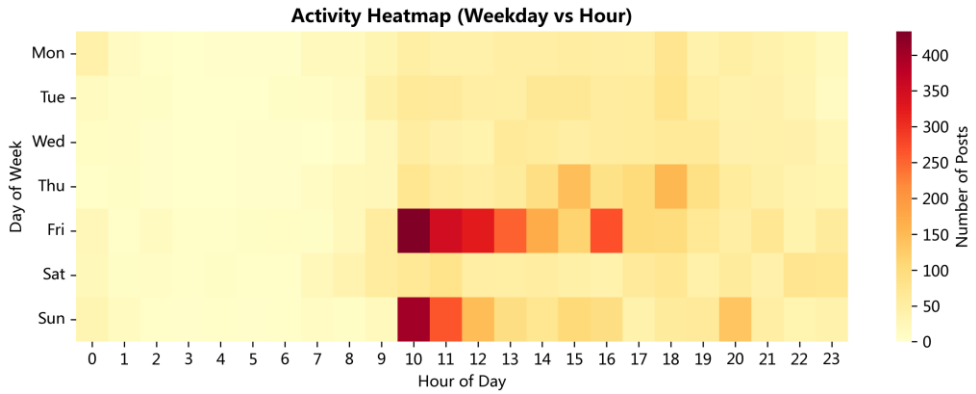


Figure 10. Hourly posting activity heatmap across weekdays and weekends for SKP-S-related Weibo content. (Source: Authors)

The detailed hourly distribution across each day of the week is illustrated in Figure 10, where peak periods typically occur after 5 PM from Monday to Thursday and after 10 AM from Friday to Sunday. These temporal patterns indicate that the mall's digitally augmented experiences serve as significant attractions during leisure periods in urban daily life. The monthly post distribution across 2019-2024 is shown in Figure 11. Notably, active social media engagement continued even during COVID-19 lockdown periods in 2020 and 2021, coinciding with increased domestic social media usage during the pandemic. This sustained activity indicates that SKP-S functions as a significant leisure destination that generates substantial social media documentation regardless of external circumstances.

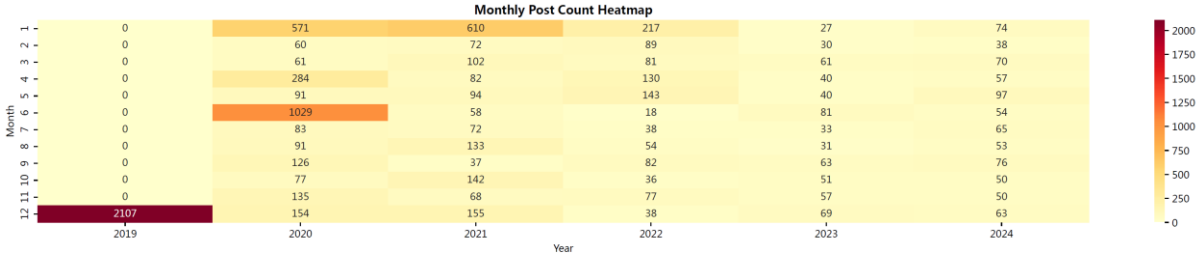


Figure 11. Monthly distribution of SKP-S Weibo posts from 2019-2024. (Source: Authors)

4.5.3 User Engagement and Participation Patterns

The social media engagement analysis reveals a power-law distribution typical of digital platforms, with 8,827 total posts generating 1,434,755 likes, 442,288 reposts, and 262,470 comments. Among these engagement activities, likes dominate, accounting for 67.0% of total engagement, while comments and reposts contribute 19.3% and 13.7% respectively, as shown in the pie chart in Figure 12 (left). These results represent an average engagement rate of 242.38 interactions per post, though engagement varies significantly with a standard deviation of 4,398.73. Notably, although there is a high volume of likes representing indirect social interaction, actual direct social interaction through comments remains relatively limited. Moreover, the histogram of the engagement distribution in Figure 12 (right) suggests that while approximately 2,800 posts receive high engagement, most SKP-S Weibo posts (around 4,800) demonstrate low engagement patterns.

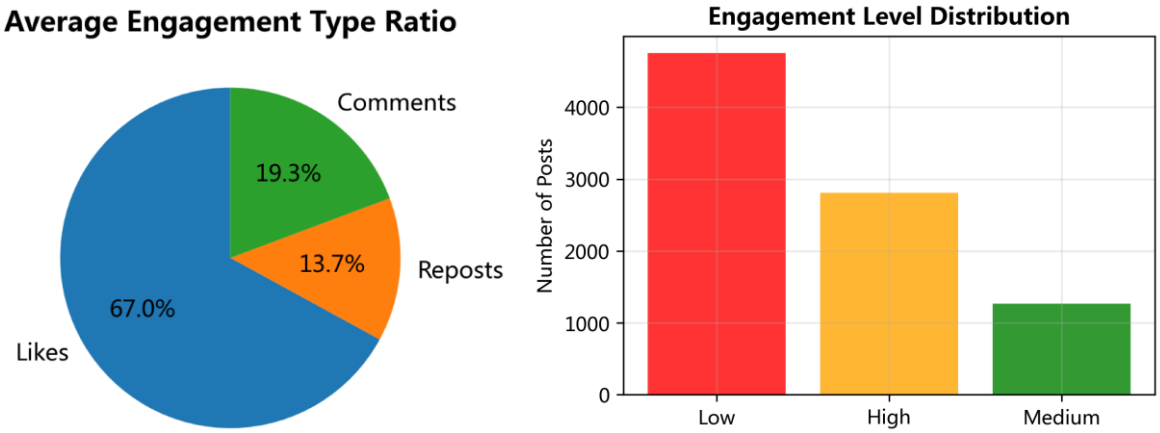


Figure 12. Distribution of engagement types showing dominance of likes over comments and reposts (left), and overall engagement level distribution across posts (right). (Source: Authors)

User participation analysis (Figure 13) demonstrates that 4,356 users (80.8%) posted only once about SKP-S, while 878 users (16.3%) could be classified as "heavy posters" who contributed multiple posts over the analysis period. A small group of 158 users (2.9%) emerged as highly active contributors, potentially functioning as informal influencers within the SKP-S social media ecosystem. Interestingly, although heavy posters averaged 4.2 posts per user compared to influencers (3.9 posts per user) and

one-time users (1 post per user), the distribution of average engagement by user type reveals that heavy posters received minimal engagement per post. In contrast, influencers obtained the highest engagement levels (over 2,500 per average post), followed by one-time users (approximately 100 per average post). This pattern suggests that some heavy posters may represent shop owners or mall operators promoting products, thus generating limited authentic social interaction with the public.

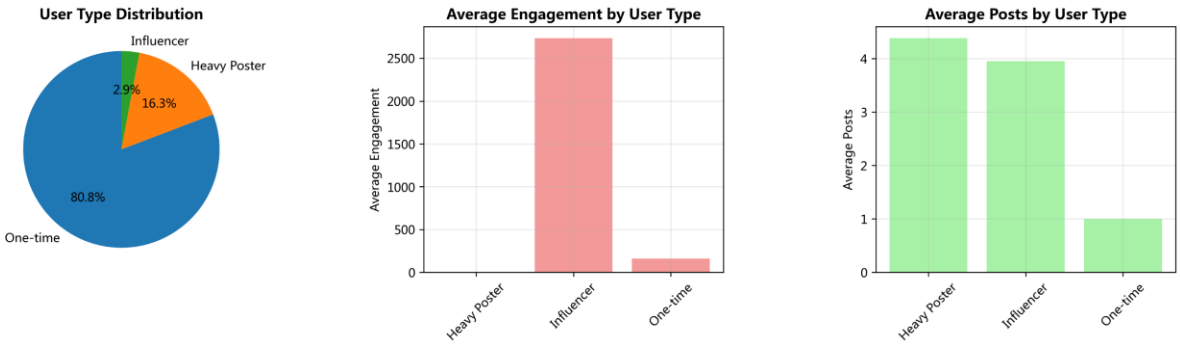


Figure 13. User behaviour analysis: distribution of user types by posting frequency (left), average engagement received by different user categories (middle), and average posts per user type (right). Source: Authors.

Furthermore, the boxplot analysis of the engagement activities of likes, comments and reposts is shown in Figure 14 (left), and the histogram of total engagement distribution is illustrated in Figure 14 (right). The identification of 442 posts (5.01%) achieving viral status (95th percentile engagement) indicates that certain types of SKP-S content possess strong social media amplification potential. Conversely, 4,752 posts received zero engagement, highlighting variability in content reception and the competitive nature of social media attention. The detailed distributions of likes, reposts, and comments are illustrated in Figure 15, indicating a sparse distribution pattern where most posts receive limited social interactions, particularly regarding direct social activity through comments.

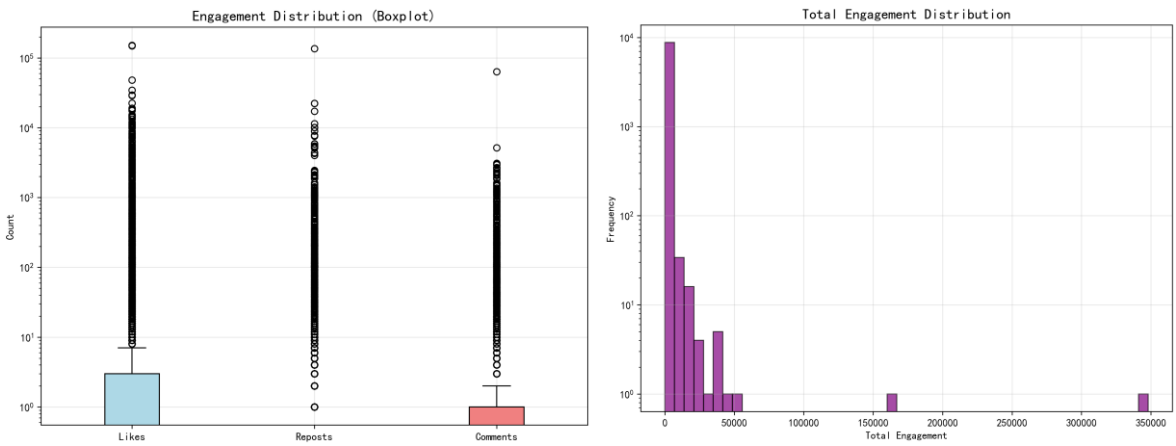


Figure 14. Boxplot analysis of engagement distribution in likes, reposts, and comments (left), and histogram analysis of total engagement distribution (right). Source: Authors.

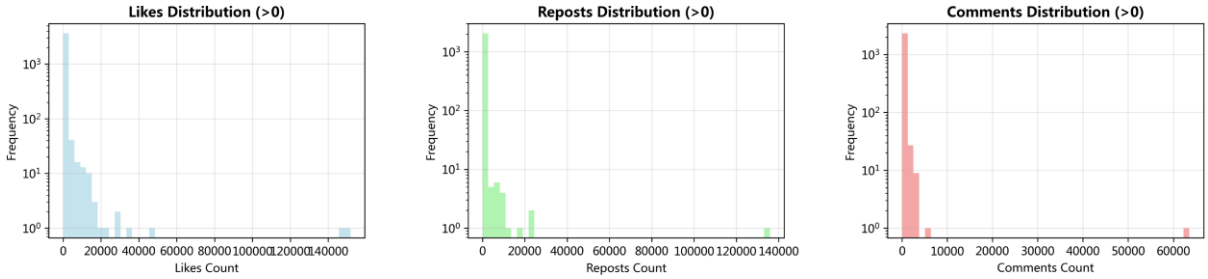


Figure 15. Detailed frequency distribution of engagement activities (likes, reposts, comments) showing the sparse nature of high-engagement content. Source: Authors.

4.5.4 Content Characteristics and Visual Engagement

Statistical analysis reveals significant differences in users' engagement based on content characteristics. According to the results shown in the pie chart in Figure 16 (left), 47.0% of analysed posts include associated images, while 53.0% contain only textual content. The image count distribution in Figure 16 (right) shows that posts with visual content predominantly feature nine images, nearly twice as frequent as posts with single images. This pattern indicates that users sharing visual content tend to use multiple images to document their experiences within these digitally-enhanced mall environments.

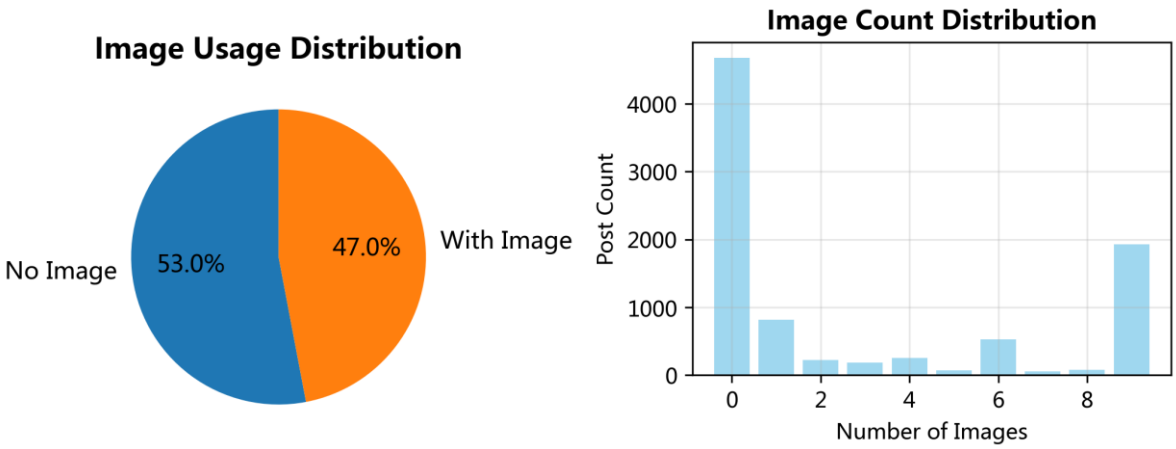


Figure 16. Visual content analysis: proportion of posts with and without images (left) and distribution of image quantities per post (right). Source: Authors.

Posts containing images demonstrate statistically significantly higher engagement rates ($p=0.0095$) compared to text-only posts, as shown in Figure 17 (left). Visual posts received an average of over 350 engagements, more than double the average engagement of text-only posts (fewer than 150 engagements). This finding supports the argument that SKP-S's visually spectacular digital installations are specifically designed to facilitate social media sharing and viral circulation. Moreover, Figure 17 (right) reveals that posts combining images with both mentions and hashtags achieve the highest average engagement of more than 900, more than triple the engagement received by

simpler combinations such as "image+hashtag" or "image only" (around 300 average engagement). This finding further demonstrates the mall's strategic design for encouraging public promotion of the "Instagrammability" of spatial experiences generated in this digitally-enhanced commercial environment.

As shown in Figure 18, the average content length of 219 characters (median: 187 characters) suggests that users prefer concise communication when sharing SKP-S experiences, likely optimised for rapid social media consumption. The high usage of hashtags (6,358 posts, 72.0% of total posts) and mentions (4,977 posts, 56.4% of total posts) indicates active utilisation of social media networking features to extend content reach and facilitate discovery by other users interested in the mall, thereby improving promotional reach to broader audiences.

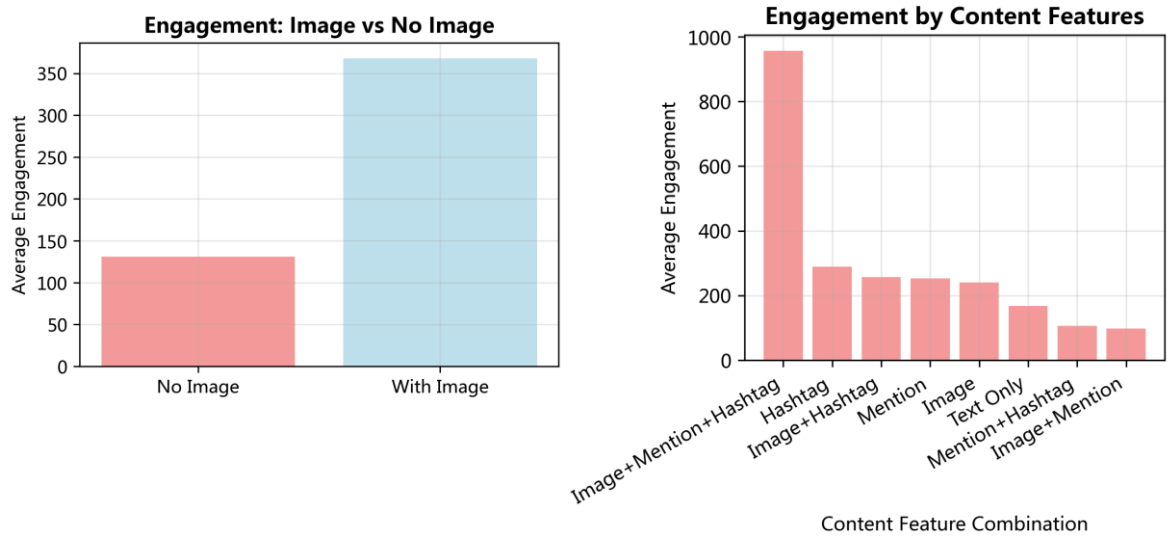


Figure 17. Visual content engagement analysis: comparison between posts with and without images (left) and engagement levels across different content feature combinations (right). Source: Authors.

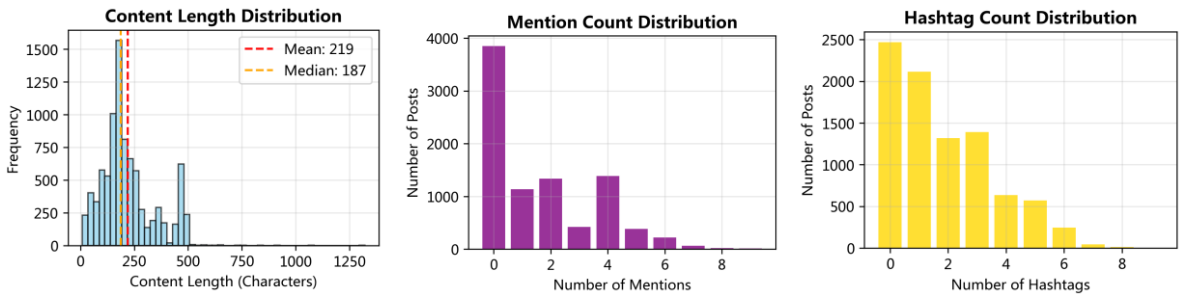


Figure 18. The distribution of content length (characters), number of mentions, and hashtags. Source: Authors.

4.5.5 Cross-Platform Content Migration and Amplification

Observational analysis of content sharing across platforms reveals distinct patterns in how spatial experiences circulate through different social media ecosystems. For example, content originating on TikTok (primarily short-form video documentation of

digital interactions) frequently migrates to Weibo as screenshot compilations and commentary posts. Conversely, high-quality photography from Weibo is often reposted on Dazhong Dianping as part of detailed review content. This cross-platform migration creates what might be termed "amplified spatial presence," where individual visits to the mall generate multiple waves of social media content across different digital platforms and user networks.

This phenomenon appears particularly pronounced for content featuring the mall's most technologically sophisticated installations, such as the digital art environments and interactive experiences documented in Sections 4.2 and 4.3. These installations seem specifically designed to facilitate what Crawford (1992) describes as "world creation" within commercial spaces, providing compelling visual content that circulates well beyond the original posting context. The analysis suggests that digital technologies in commercial spaces are strategically curated to facilitate content multiplication, extending the spatial influence of commercial environments far beyond their physical boundaries.

4.5.6 Implications for Digital Spatial Control

The quantitative social media analysis provides empirical support for the theoretical argument that digital technologies intensify rather than subvert the heterotopian functions of commercial spaces. The massive scale of social media engagement (over 2.1 million total interactions) demonstrates that SKP-S successfully extends its spatial influence far beyond its physical boundaries, creating what might be described as a "translocally networked heterotopia" that operates across both physical and digital domains.

The concentration of content creation among a relatively small group of active users (16.3% heavy posters, 2.9% potential influencers) suggests that the mall's social media presence relies on cultivating dedicated community members who function as informal marketing agents. This pattern aligns with contemporary "influencer economy" dynamics while serving the mall's commercial objectives through seemingly organic social media advocacy.

The statistical significance of visual content in driving engagement ($p=0.0095$) confirms that SKP-S's investment in spectacular digital installations serves measurable social media objectives, transforming visitors into content creators who extend the mall's commercial influence through their personal social networks. This process exemplifies how digital technologies enable commercial spaces to colonise previously private social relationships through social media sharing practices, thereby intensifying their heterotopian control mechanisms rather than democratising spatial access.

4.6 Preliminary Computer Vision Analysis of Visitor-Generated Images

To provide an additional empirical layer for assessing the spatial character of visitor engagement at SKP-S, a preliminary computer vision classification was applied to the 9,176 images sourced from the Weibo dataset. At this stage, images were classified at the most fundamental level of spatial organisation: interior versus exterior space. The results reveal a striking interiorisation of visitor photographic documentation. As shown in Table 1, 95.2% of all classified images ($n = 8,739$) depict interior spaces, compared to only 4.8% ($n = 437$) capturing the exterior facade—an approximately 20:1 interior-to-exterior ratio ($p < 0.001$). This extreme concentration of visitor-generated visual

content within the enclosed interior environment provides quantitative corroboration of malls as systematically enclosed hyper-consumption enclaves (Crawford, 1992; Dehaene & De Cauter, 2008). Shane (2008) describes the enclave as a foundational urban morphological type in which bounded interior environments redirect attention inward, establishing a condition of spatial separation from the surrounding city. The overwhelming interior dominance documented here reveals precisely this enclavic condition: SKP-S's photographic presence, as constituted through the social media practices of its visitors, is almost entirely self-referential, detached from its immediate urban surroundings. This enclavic interiorisation constitutes a necessary structural condition for the heterotopian logic developed in this paper—a space can only operate as a site of compensation and illusion insofar as it successfully insulates its visitors from the realities of the city outside (Crawford, 1992; Dehaene & De Cauter, 2008).

Table 1. Spatial distribution of visitor-generated images at SKP-S. (Source: Authors)

Space Type	Count	Percentage (%)
Interior Space	8739	95.2
Exterior Space	437	4.8
Total	9,176	100.0

5 Discussion

5.1 Theoretical Implications for Heterotopia Theory

The findings provide crucial insights into how digital technologies transform the heterotopian functions of commercial spaces. Rather than subverting the segregative capacity of malls, digital augmentation appears to intensify their heterotopian characteristics through more sophisticated means of social control. This supports Johnson's (2013) argument that heterotopias are not static spatial forms but dynamic systems that adapt to changing technological and social conditions.

The case study reveals how digital technologies create what might be termed "augmented heterotopias"—spaces that maintain their compensatory and illusory functions while deploying new mechanisms of spatial control. While the immersive digital environments of SKP-S appear to broaden access to compelling urban experiences, this apparent broadening occurs under structural conditions of segregation from authentic public space: the spectacular interior, precisely because it substitutes for the genuine public domain, reinforces rather than dissolves the boundary between commercial enclosure and urban life outside. This finding complicates uncritical accounts of digital transformation in commercial spaces whilst supporting critical perspectives that emphasise the intensification of commercial control through technological mediation (Zuboff, 2019).

The concept of "spatial transduction" (Kitchin & Dodge, 2011) proves particularly relevant for understanding these dynamics. The SKP-S case demonstrates how digital technologies both determine and augment mall spatialities, creating hybrid environments where the boundaries between physical and virtual experiences become increasingly

blurred. However, this blurring does not necessarily lead to spatial liberation but may instead create new forms of what Deleuze (1992) describes as "control society" mechanisms.

It is important, however, to acknowledge that the relationship between visitors and the mall's digital apparatus is not reducible to a simple binary of control and passivity. The temporal data demonstrating concentrated leisure-time posting (59% of posts during weekend periods), the high average image counts per visual post, and the enthusiastic engagement with themed installations all suggest that many visitors experience genuine pleasure in, and exercise forms of personal creative agency within, the mall's spectacular environment. Some visitors may appropriate the mall's digital installations as material for personal storytelling or aesthetic expression that partially exceeds the mall's commercial intent. What the present analysis demonstrates is not that all visitors are passive subjects of commercial manipulation, but rather that the structural conditions of digital augmentation—the architecture of spectacle, the selective spatial design, and the social media infrastructures that channel and monetise visitor-generated content—systematically serve commercial rather than genuinely public interests, regardless of the subjective pleasures experienced by individual visitors. This distinction, between structural function and individual experience, is consistent with a dynamic reading of heterotopia (Johnson, 2013) and points to the value of ethnographic and interview-based methods in future work to explore the full spectrum of ways in which visitors negotiate, selectively participate in, and occasionally resist the spatial logics of augmented commercial environments.

5.2 Digital Technologies and Urban Public Life

The analysis of social media engagement around SKP-S reveals complex relationships between digital sharing practices and public space dynamics. While the massive volume of social media content (43 million Weibo views, 180 million TikTok plays) might suggest enhanced public engagement, closer examination reveals that these practices primarily serve to extend the mall's commercial influence rather than fostering genuine public discourse.

The phenomenon of "Instagrammability" (Churchill, 2022) observed at SKP-S demonstrates how digital technologies transform spatial experiences into commodified content for social media circulation. This process creates what Degen and Rose (2012) describe as "curated publicity" that simulates public engagement while remaining firmly within commercial control. The hyper-real digital environments that dominate posts about SKP-S exemplify this dynamic, offering spectacular visual content that obscures the underlying commercial imperatives.

These findings align with Voyce's (2006) analysis of shopping malls as sites where "consumerist citizenship" replaces genuine public engagement. The digital augmentation at SKP-S intensifies this process by creating more compelling and shareable consumer experiences that further distance visitors from authentic urban public life.

5.3 Implications for Urban Planning and Policy

The intensification of heterotopian functions through digital augmentation has significant implications for urban planning and public space policy. As digitally augmented commercial spaces become more attractive alternatives to traditional public spaces,

they may contribute to the continued erosion of the genuine public domain (Crawford, 1992). Urban planners and policymakers must consider how to maintain the vitality of authentic public spaces in competition with increasingly sophisticated commercial alternatives.

The case study suggests that regulations governing commercial space design should address digital technologies' role in shaping urban experiences. This might include requirements for commercial developments to contribute to genuine public space provision or limitations on the types of digital surveillance and behavioural tracking permitted in quasi-public commercial environments. Furthermore, the findings highlight the need for urban design strategies that can compete with the compelling experiences offered by digitally augmented commercial spaces. This might involve integrating beneficial digital technologies into public spaces while maintaining their non-commercial character and democratic accessibility.

5.4 Comparative Perspectives and Global Implications

While this study focuses on a single case in Beijing SKP-S, the implications extend to digitally augmented commercial spaces globally. The digital technologies deployed at SKP-S—hyper-real installations, AR interactions, surveillance systems—are increasingly common in upscale malls worldwide. This suggests that the intensification of heterotopian functions through digital augmentation may represent a broader trend in contemporary urban development.

However, the specific cultural and economic context of Chinese urban development may influence how these technologies are received and implemented. The massive scale of Chinese commercial developments and the particular characteristics of Chinese social media platforms (Weibo, TikTok) create unique conditions for digital spatial engagement that may not directly translate to other contexts. Therefore, future research may need to examine how digital augmentation functions in different cultural and economic contexts, particularly in cities with stronger traditions of public space provision and different regulatory approaches to commercial space development.

5.5 Methodological Contributions and Innovations

This study demonstrates the value of combining behavioural observation with social media analysis to understand contemporary spatial dynamics. The integration of theoretical analysis with empirical case study methods provides a comprehensive approach to examining digitally augmented spaces that could be applied to other commercial and public environments.

The social media analysis methodology developed in this research offers new possibilities for understanding how digital sharing practices mediate spatial experience. By examining both the content and volume of social media engagement, researchers can gain insights into how physical spaces operate within broader digital networks and commercial systems.

The application of heterotopia theory to digitally augmented spaces contributes to ongoing theoretical debates about the relationship between technology and space. The concept of "augmented heterotopias" developed through this analysis provides a framework for understanding how digital technologies transform rather than eliminate the controlling functions of commercial spaces. The preliminary computer vision spatial classification introduced in this paper further demonstrates the potential of image-based

computational methods for quantifying spatial phenomena that are theoretically significant in critical urban studies–an avenue that warrants systematic development in future research.

6 Conclusion

The comprehensive analysis of Beijing SKP-S—an exemplary *dispositif* of hyper-consumerist spectacle that articulates futurible "post-human" narratives through dynamic phygital environments—reveals that the apparent subversion of the segregating heterotopian conditions has severe limitations. The findings indicate that the deployment of augmented phygital spectacle restructures the foundational city-antagonist logic: rather than reintegrating, reassociating, and repoliticising quasi-public space, it remodulates socio-spatial quartering and complicit self-segregation, undermining its potential to foster genuine social interaction and collective protension. We formulate the concept of "heterotopic remodulation" to capture this transformation, where malls maintain their compensatory and illusory Foucauldian functions while deploying new mechanisms of spatial control that operate across both physical and digital domains, creating perpetually metastable networks. While phygital spectacle introduces *new compensatory functions*, which appear to counter the social fragmentation of the hyper-consumption enclaves by promoting public engagement through digital social networks, and *new illusory functions*, which enhance spectacular potential to foster collective protensive imagination of possible futures, these innovations cunningly remodulate the segregative capacity of the hyper-consumption centre over space and time. The quantitative social media analysis provides empirical evidence for this conclusion, showing the effects of a new systemic sociotechnical apparatus for the formation of unresponsive networks, probably with an echo chamber character, that extends the centre's spatial influence far beyond its physical boundaries. The 2.1 million social media interactions and 43 million total views of SKP-S content on Weibo, and the 180 million TikTok plays collectively demonstrate the emergence of what we term a "translocally networked heterotopia" operating across both physical and digital domains. This phenomenon enables commercial spaces to colonise previously private social relationships through social media sharing practices, transforming visitors into informal marketing agents who extend the mall's commercial influence through their personal social networks.

The statistical significance of visual content in driving engagement ($p=0.0095$) confirms that SKP-S's spectacular digitality—the humanoid robots, immersive installations, and responsive environments that articulate its futurible theme—serves measurable commercial objectives rather than genuine public purposes. Posts combining images with mentions and hashtags achieve triple the engagement of simple visual content, revealing sophisticated strategies for commercial promotion disguised as spontaneous social interaction. Furthermore, the temporal patterns showing peak activity during leisure periods (59% weekend posting, 71.1% after-work hours) demonstrate that digital technologies instrumentally transform commercial spaces into entertainment-focused hyper-spectacular environments. This transformation increases the vulnerability of a public that progressively relies on digital apparatuses mediating engagement with urban space and society, potentially displacing more authentic forms of social encounter and collective life (Ou et al., 2022).

This intensification of heterotopian control through digital augmentation can be further theorised as a *remodulated form of alienation*—one that operates not through the collective dream-worlds of the enclave, but through its fragmentation into a distributed spectacle. Extending the critique to the urban condition offered by Walter Benjamin in *Paris, the capital of the Nineteenth century*—indicating that "The department store is the last promenade for the flâneur. There his fantasies were materialized" (Benjamin, 1999, p. 895); and warning that there he wandered in a dramatical, illusory pursuit of emancipation—the protensions catalysed by the SKP-S phantasmagorical theatre mixing fantasy, memory and desire reveal a crucial transformation. As the flâneur—the only urbanite who could try but inevitably failed to keep a critical distance from the alienating world of commodities—the contemporary wanderer of the phygitally augmented spectacle has foreclosed its emancipatory potential. The social production of the "post-human" spectacle is confined to a relational *phantom objectivity*, where the personal relational fantasy world, transduced via individual smartphones, resonates into vast bay, unresponsive networks. In this process, the visitors themselves undergo a metamorphosis: from Bohemians to platform content creators, from consumers to products. By documenting their immersion in the hyper-real environment and sharing it across social networks, the individual becomes the very commodity to be watched and—as *dividual*—analysed as a complicit agent.

This remodulated alienation is empirically confirmed by the social media engagement patterns documented in Section 4.5.3. The dominance of likes over comments—67.0% of total engagement for likes compared to only 19.3% for comments—reveals a sociality of passive affirmation rather than genuine dialogue. Likes represent what might be termed *spectatorial engagement*: the user watches, approves, and moves on, stripped of critical potential and redirected toward the validation of commercial spectacle. Direct social interaction through comments, by contrast, remains remarkably limited, suggesting that the mall's digital augmentation fosters connection to the spectacle itself rather than meaningful connection between persons. The pre-eminence of one-time posters (80.8% of all users) further corroborates this interpretation. These visitors arrive, capture their encounter with the "post-human" phantasmagoria, post their content, and depart—their ephemeral contribution to the mall's digital ecosystem serving momentarily to extend its reach before they themselves recede into the mass of passive spectators. The heavy posters and influencers who sustain ongoing engagement represent not a counter-current to this logic but its professionalised extension: they are the specialists of the dream-world, the keepers of the phantasmagoria whose sustained output keeps the spectacle circulating and the one-time participants returning to watch. The augmented heterotopia thus enhances alienation by making the individual both subject and object of the spectacle—the dreamer who has become the dream.

The integration of digital technologies has not subverted the segregative functions of commercial enclaves but reconfigured their operations by producing "metastable states coexisting in one and the same modulation" (Deleuze, 1992, p. 5). By broadening access to digitally constructed alternate realities—the responsive phygital ecologies of "post-human" narration—the centre enhances its illusion-by-segregation capacity, embodying an updated condition of hyper-real, "perfect, as meticulous, as well arranged" heterotopia that further alienates from the "disorderly, ill construed and sketchy" reality of the city (Foucault, 2008 [1967], p. 21). This steadily reassociates exclusionary networks and situates the consumer in a struggle that may "lead somewhere between

the transparency belonging to those who embrace the joys of marketing, and the transience of those cutting away from their own identity" (Brusseau, 2020, p. 23).
These findings confirm the research question's implied "genealogical" concern: the digitally augmented spectacle in contemporary commercial enclaves has not reversed city-antagonism by reintegrating, reassociating, and repoliticising quasi-public space. Instead, it has cunningly remodulated its insular functions through new mechanisms of socio-spatial engagement that simultaneously foster digital social relationality and collective imagination while intensifying spatial segregation. The concept of "augmented heterotopias" developed through this analysis demonstrates how commercial spaces maintain their compensatory and illusory functions while deploying more sophisticated mechanisms of spatial control that operate across physical and digital realms.
These findings contribute to understanding the changing power relations in mobile internet society and shed light on the evolution of public space privatisation and the commodification of virtual "public" life in the digital age. They indicate the continued erosion of genuine public space in contemporary urban environments, confirming that the intensification of heterotopian functions through digital augmentation represents not a democratisation of urban experience but a sophisticated extension of commercial hegemony over urban daily life.

7 Limitations and Future Research

7.1 Research Limitations

This study's focus on the Beijing SKP-S mall, while providing detailed insights into digital augmentation processes, presents several methodological limitations. As a single case study of an extreme example of digital integration within China's unique commercial development context, the generalisability of findings to other commercial spaces and cultural contexts remains limited. SKP-S represents a luxury retail environment with exceptional technological investment that may not reflect typical shopping centre experiences.
The social media analysis presents inherent limitations relating to platform representativeness that require explicit acknowledgement. The Weibo dataset captures only the practices of visitors who chose to publicly document their experience on this platform—a self-selected subset that, as contextualised in Section 4.5.1, is demographically concentrated among female users, relatively skewed towards non-Beijing origins, and composed predominantly of established account holders. Whilst the female dominance of the posting population is broadly consistent with both Weibo's platform demographics and SKP-S's luxury retail positioning, the substantial share of non-Beijing users introduces an important interpretive caveat: a portion of the social media dataset is likely to reflect tourism-oriented or single-visit engagement rather than habitual local use, and the spatial practices associated with these two visitor modes may differ in ways that the present analysis cannot fully disentangle. Additionally, visitors who document their experiences primarily on other platforms (such as WeChat for private sharing, RedNote for lifestyle content, or TikTok for video), as well as those who visit without producing any social media content at all, are entirely absent from the dataset. These populations–including older visitors and less digitally active demographic segments–may engage with the mall's spaces in qualitatively different ways that are not captured by the social media record. These limitations are characteristic of social

media-based spatial research more broadly (Boyd & Crawford, 2012) and do not invalidate the findings, but they underscore the importance of treating the social media analysis as one empirical lens on a complex spatial phenomenon rather than a comprehensive account of it. Future research that combines social media analysis with visitor surveys, intercept interviews, or multi-platform data collection would enable a more complete and demographically inclusive understanding of how different visitor segments engage with the mall's digital environment.

The behavioural observation component, whilst providing qualitative contextualisation for the social media analysis, was conducted over a limited number of field visits and should be understood as contextual and illustrative in character. The observations were not subject to formal systematic protocols, inter-rater reliability testing, or standardised temporal sampling procedures; accordingly, no behavioural statistics or movement counts are derived from the observational data. The observational findings are intended to supplement and ground the quantitative analysis rather than to constitute an independent systematic study of visitor behaviour. Future research would benefit from a more structured observation protocol, including pre-defined observation windows, standardised behavioural categories, and, where feasible, passive pedestrian counting or behavioural mapping to provide more robust empirical grounding for claims about visitor movement and spatial engagement.

The preliminary computer vision analysis reported in Section 4.6 is subject to the limitations inherent in any automated image classification, including potential misclassification at the margin. The interior/exterior classification reported here is necessarily surface-level, and a more granular typological analysis of interior spatial categories is needed for future work.

The research was conducted during the post-COVID-19 period, when shopping behaviours and social media engagement patterns may have been atypical. Additionally, the rapid pace of digital technology development means that the specific technologies analysed may quickly become obsolete, potentially limiting the long-term relevance of technological findings, though the theoretical insights regarding heterotopia theory may prove more durable.

7.2 Future Research Directions

Future research should conduct comparative analyses across multiple shopping centres with varying levels of digital integration to better understand the relationship between technological augmentation and heterotopian functions. A particularly promising direction would be a systematic comparison between malls that incorporate augmented or immersive digital technologies and those that do not, or between malls with contrasting theming strategies. Such a comparison would enable a clearer causal assessment of the specific contribution of digital augmentation to spatial experience, visitor behaviour, and social media-mediated engagement, thereby strengthening the causal claims that the present single-case analysis can only suggest.

Cross-cultural comparative studies examining digitally augmented commercial spaces in different national contexts would provide valuable insights into how cultural values and regulatory frameworks influence technology implementation and reception. Longitudinal studies tracking the evolution of specific commercial spaces through digital transformation processes would provide insights into whether the intensification of

heterotopian functions represents a temporary adaptation or a durable structural shift in how commercial spaces are designed to capture public attention and behaviour. The user profile and computer vision data collected for this study provide a foundation for more detailed analysis in future work. In particular, a granular computer vision investigation that classifies visitor-generated images into a systematic spatial typology–distinguishing between functionally and thematically distinct zones within the mall–and links these spatial categories to user demographics and posting behaviour could illuminate whether the mall's spectacular apparatus disproportionately attracts and retains particular visitor segments, thereby providing direct empirical evidence for the spatial exclusion mechanisms theorised in the present paper.

Advanced computational methods for analysing social media data, including natural language processing, extended computer vision analysis and social network analysis of sharing patterns, could reveal deeper insights into how digital technologies influence the public perception and social circulation of spatial experiences. The integration of location-based behavioural data (where ethically permissible) could provide a more precise understanding of movement patterns within digitally augmented environments. Research examining the regulatory and policy implications of digitally augmented commercial spaces represents an important frontier, particularly regarding privacy, surveillance, and the commodification of urban experience. Comparative policy research could inform best practices for balancing commercial innovation with public space preservation. Finally, given this study's findings regarding the intensification of commercial control through digital augmentation, future research should examine how public spaces can effectively compete with digitally augmented commercial alternatives whilst maintaining their democratic character and non-commercial accessibility.

References

Benjamin, W. (1999 [1982]) *The Arcades Project*. Translated by H. Eiland and K. McLaughlin. Cambridge, MA: The Belknap Press of Harvard University Press.

Boy, J.D. and Uitermark, J. (2023) *On Display: Instagram, the Self, and the City*. Oxford: Oxford University Press.

Boyd, D. and Crawford, K. (2012) 'Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon', *Information, Communication and Society*, 15(5), pp. 662–679.

Brusseau, J. (2020) 'Deleuze's Postscript on the Societies of Control: Updated for Big Data and Predictive Analytics', *Theoria*, 67(164), pp. 1–25.

China Internet Network Information Centre (CNNIC) (2025) *The 55th Statistical Report on China's Internet Development* [Online]. Available at: www.cnnic.com.cn/IDR/ReportDownloads/202505/P020250514564119130448.pdf (Accessed: 14 March 2026).

Churchill, E. (2022) 'Platform Urbanism, Urban HCI, and Digital Civics', *Interactions*, 29(3). Available at: https://doi.org/10.1145/3530683

Coyne, R. (2010) *The Tuning of Place: Sociable Spaces and Pervasive Digital Media*. Cambridge: The MIT Press.

Crawford, M. (1992) 'The World in a Shopping Mall', in Sorkin, M. (ed.) *Variations on a Theme Park: The New American City and the End of Public Space*. New York: Hill and Wang, pp. 3–30.

Degen, M. and Rose, G. (2012) 'The sensory experiencing of urban design: The role of walking and perceptual memory', *Urban Studies*, 49(15), pp. 3271–3287.

Degen, M. and Rose, G. (2024) 'Conceptualising aesthetic power in the digitally-mediated city', *Urban Studies*, 61(11), pp. 2176–2192.
Dehaene, M. and De Cauter, L. (2008) 'Heterotopia in a postcivil society', in Dehaene, M. and De Cauter, L. (eds.) *Heterotopia and the City: Public Space in a Postcivil Society*. Abingdon: Routledge, pp. 15–22.
Deleuze, G. (1992) 'Postscript on the Societies of Control', *October*, 59, pp. 3–7.
Ding, W. and Guo, T. (2023) 'Research on the application of interactive installation art in modern commercial space under the background of experience economy', in *Proceedings of the International Conference on Human-Computer Interaction (HCII 2023)*. Cham: Springer Nature Switzerland, pp. 111–119.
Foucault, M. (1977) 'Nietzsche, Genealogy, History', in Bouchard, D.F. (ed.) *Language, Counter-Memory, Practice: Selected Essays and Interviews*. Ithaca, NY: Cornell University Press, pp. 139–164.
Foucault, M. (2008 [1967]) 'Of other spaces', in Dehaene, M. and De Cauter, L. (eds.) *Heterotopia and the City: Public Space in a Postcivil Society*. Abingdon: Routledge, pp. 13–29.
Gerbaudo, P. (2012) *Tweets and the Streets: Social Media and Contemporary Activism*. London: Pluto Press.
Healey, P. (2020) *Collaborative Planning: Shaping Places in Fragmented Societies*. London: Bloomsbury Publishing.
Johnson, P. (2013) 'The geographies of heterotopia', *Geography Compass*, 7(11), pp. 790–803.
Kitchin, R. and Dodge, M. (2011) *Code/Space: Software and Everyday Life*. Cambridge: The MIT Press.
Manfredini, M. and Jenner, R. (2015) 'The Virtual Public Thing: De-re-territorialisations of public space through shopping in Auckland's urban space', *Interstices: Journal of Architecture and Related Arts*, 16, pp. 70–82.
Manfredini, M. (2017) 'The Augmented Meta-Public Space: Interpreting emerging transductive territories in enhanced centres of consumption', *The Journal of Public Space*, 2(3), pp. 118–128.
Manfredini, M. (2019a) 'Mobility, translocalisation and transduction: The resilience of new urban commons in the era of advanced technospheres', in Marata, A. (ed.) *Diverse City*. Rome: CNAPPC – Consiglio Nazionale Architetti Paesaggisti Pianificatori e Conservatori, pp. 1–10.
Manfredini, M. (2019b) 'Simulation, Control and Desire: Urban Commons and Semi-Public Space Resilience in the Age of Augmented Transductive Territorial Production', *The Journal of Public Space*, 4(2), pp. 179–198.
Manfredini, M. (2020) 'Affirmatively Reading Post-consumerism: Distributed Participatory Creativity and Creative Destruction of the Malled Metropolitan Centres of Auckland, New Zealand, during COVID-19 Lockdown', *The Journal of Public Space*, 5(3), pp. 207–226.
Manfredini, M. (2022) 'The Mediatized City: The Structural Transformation of Emplaced Relationality and the Resilience of Depoliticized Urban Commons', in Brears, R.C. (ed.) *The Palgrave Encyclopedia of Urban and Regional Futures*. Cham: Springer Nature, pp. 1–11. Available at: https://doi.org/10.1007/978-3-030-51812-7_321-1
Marcuse, P. (2005) 'Enclaves yes, ghettos no: Segregation and state', in Varady, D.P. (ed.) *Desegregating the City: Ghettos, Enclaves, and Inequality*. Albany: State University of New York Press, pp. 15–30.
Muzzio, D. and Muzzio-Rentas, J. (2008) '"A kind of instinct": The cinematic mall as heterotopia', in Dehaene, M. and De Cauter, L. (eds.) *Heterotopia and the City: Public Space in a Postcivil Society*. Abingdon: Routledge, pp. 149–162.
National Bureau of Statistics of China (2026) *Wang Pingping: China's Total Population Reached 1,404.89 Million in 2025, with Continued Progress in High-Quality Population Development*

[Online]. Available at: www.stats.gov.cn/sj/sjjd/202601/t20260119_1962338.html (Accessed: 14 March 2026).

Ou, Y. (2021) *Public Space and Consumption in the Mobile Internet Era: The Heterotopic Inversions of Ultra-modern Financialised Urban Centres*. Master's dissertation. University of Auckland.

Ou, Y. and Manfredini, M. (2020) 'Public Space and Consumption in the Mobile Internet Era: A Study on the Heterotopic Inversion of Ultra-Modern Shopping Malls', in *Proceedings of the 13th International Forum on Urbanism (IFoU)*. October 2020, pp. 390–409.

Ou, Y. and Manfredini, M. (2022) 'The Configurational Analysis of the Ultra-Modern Shopping Centre in the Urban Restructuring of the Mediatized Era: A Study of Ultra-Modern Centre Based on the Method of Space Syntax', in *Proceedings of the 13th International Space Syntax Symposium (SSS13)*.

Ou, Y., Manfredini, M., Gao, G., Sun, R. and Su, Q. (2022) 'Sociospatial Wellbeing in Urban Commercial Centres: An Analysis of Abstraction and Relationality of Novel Mall Spatialities in the Mobile Internet Era', in *Proceedings of the International Conference on Indonesian Architecture and Planning*. Singapore: Springer Nature Singapore, pp. 557–578.

Pine, B.J. and Gilmore, J.H. (1998) 'Welcome to the Experience Economy', *Harvard Business Review*, 76(4), pp. 97–105.

Real Estate and Business (2022) *2021 National Shopping Mall Sales Ranking TOP50* [Online]. WeChat Official Account. Available at: https://mp.weixin.qq.com/s/cknbX3u16zZ3huMAxdUDyA (Accessed: 30 August 2025).

Reinartz, W., Wiegand, N. and Imschloss, M. (2019) 'The impact of digital transformation on the retailing value chain', *International Journal of Research in Marketing*, 36(3), pp. 350–366.

Rigby, D. (2011) 'The future of shopping', *Harvard Business Review*, 89(12), pp. 65–76.

Roux, D., Guillard, V. and Blanchet, V. (2018) 'Of counter spaces of provisioning: reframing the sidewalk as a parasite heterotopia', *Marketing Theory*, 18(2), pp. 218–233.

Schumpeter, J.A. (2003 [1942]) *Capitalism, Socialism and Democracy*. London: Routledge.

Shane, D.G. (2008) 'Heterotopias of illusion: from Beaubourg to Bilbao and beyond', in Dehaene, M. and De Cauter, L. (eds.) *Heterotopia and the City: Public Space in a Postcivil Society*. Abingdon: Routledge, pp. 271–284.

Sina Weibo Data Centre (2024) *2024 Weibo User Consumption Trend Report* [Online]. Available at: https://data.weibo.com/report/reportDetail?id=473 (Accessed: 10 March 2026).

Voyce, M. (2006) 'Shopping malls in Australia: The end of public space and the rise of "consumerist citizenship"?', *Journal of Sociology*, 42(3), pp. 269–286.

Yunus, F. and Akhtar, A. (2025) 'Impact of Social Media on Consumer Buying Behavior in the Offline Mode', *Management and Economics Research Journal*, 11(2), pp. 1–12. Available at: https://doi.org/10.18639/MERJ.2025.9900110

Zuboff, S. (2019) *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. New York: PublicAffairs.