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Making Places: From Non-Place to User-Generated Space Through a Diversity of Media

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Abstract

The prevalence of rich and dynamic multimedia information has dramatically accelerated the development of communicative non-places over the last 30 years. This has prompted planners to consider the question of how the long-term shift from a place-based to a non-place-networked public realm can be achieved. This article proposes the hypothesis that users of digital infrastructure in non-places create temporary non-places. In this process, a "non-place," as intended by Augé, is neutral and lacks identity, but digital technology endows this physical non-place with new characteristics: identical, relational, and historical. By focusing on London as a case city, this article proposes a new method for observing the transformation process of urban places and non-places from location-based social media data. The research involved collecting, quantitatively, geo-targeted contributions within London during a predefined period, and an analysis of contributions on social media over time, collected from X, Foursquare, and Instagram. Daily digital activity patterns show distinctive temporal narratives in non-place-based digital spaces. The key findings from these patterns are: (a) There is a rhythmic difference between digital and physical activities in non-places; and (b) non-places accelerate the use of digital technologies as they stimulate the desire to share personal status through social media. The study aims to understand what placemaking practices occur in spaces overlayed by invisible infrastructures, as well as users' self-generated spatio-temporal perceptions.

Keywords

digital activity patterns; location-based social media; non-places; placemaking; spatio-temporal perceptions; temporal narratives

1. Introduction

This article assumes that two closely related concepts have expanded noticeably in the late 20th century and early 21st century: digital media; and the development of urban non-places. As introduced by Marc Augé, non-places refer to transient spaces that do not foster social connections among people (Augé, 1995, p. 78). It is crucial to emphasize that non-places encompass both physical and virtual reality (Fernández, 2018, p. 215). Indeed, communicative non-places have expanded and grown most significantly in response to the pace of social change, largely caused by the development of virtual communications. According to Augé, with regard to the dimensions of virtual space, virtual non-places are "spaces of communication: screens, communication infrastructures, waves with immaterial appearance such as Wi-Fi" (Augé, 1995, p. 89). Subjective, user-specific, and customized social media interfaces enable people to consume standardized spaces in their own personalized way. Mobile devices and wireless networks promote mixed occupancy of public places and the deprogramming of architecture (Anagnostou & Vlamos, 2011). These non-places, that are applied to areas through soft occupation, will most often create small, closed personal domains within public space, and allow a timeless and delocalized domain to be shared (Eriksson et al., 2007, p. 31). The media micro-environments can be generated from particular non-places within social non-places and give the urban environment a humanized social atmosphere. In this process, digital media adorns non-places, which leads users to relieve the loneliness of waiting in transit situations by entering a personal, virtual non-place. Undoubtedly, in terms of transforming the way shared spaces are experienced and by customized emotional surroundings, this individual sphere is filled with personal emotions that can often be more profound than traditional physical non-places.

The revolution in information technology, the emergence of artificial intelligence, and the continued social isolation after the Covid-19 pandemic, have all exacerbated the dynamics of individualization ("Even after Covid-19 crisis," 2022; Nelson, 2020, para. 10; Reades & Crookston, 2021). The planning world has raised the question of how the long-term shift from a place-based to a non-place-networked public realm can be accommodated, or even achieved, if it is considered desirable (Worpole, 2021, para.3). A growing body of research is now discussing how to move towards non-place urban design. For example, Coyne (2007) demonstrates how situated cognition of places and non-places through virtual reality is now occurring through, inter alia, on-site seminars at supermarkets, immigration offices, and airport terminals. Spinne (2007, p. 42) explores the sensory construction of non-place in mobile practice through cycling the city. Ciuccarelli et al. (2014) use visualization data obtained from social media as a source of knowledge for non-place planning and management. The methodology of identifying places and non-places via crowd-harvested photo data is posited by Bauder (2016). Fernández (2018) states that music is an invisible infrastructure used to occupy and humanize non-places. And Ayiter (2019) relates Augé's concept of non-place to the avatar of perpetual, three-dimensional, real-time virtual builders' worlds, questioning whether the metaverse is a "place" or "non-place."

Previous urban design literature has touched upon the distinction between non-place and place from the viewpoint of sensory experience and subjectivity. This distinction has been identified as a potential research topic for urban planning (Harvie, 1996; Maximiliano, 2018; Merriman, 2004; Moran, 2005). However, in the existing literature, there is a need to be more specific about abstract terms such as place and non-place. There is growing evidence that the relationship between place and non-place is constantly transforming in the modern world (Hendry, 2014). The geographical concept of space as only a physical entity has been

disputed (Massey, 2005). Instead, space has been discussed as ephemeral, sensory, and performative (Wunderlich, 2014, p. 62). It acquires a specific meaning, especially so when personal experience is incorporated. In these contexts, digital media creates the potential to redefine a space. Non-places become lived places because emotions are aroused. This statement is the cornerstone for understanding the focus of this study: People's use of digital infrastructure in non-places suggests they create a temporary place in those non-places. In this process, the non-place is neutral and lacks character, but digital technology endows this physical non-place with new characteristics: identical, relational, and historical. Therefore, from a contemporary networked experience perspective, it is meaningful to investigate the transformative processes of non-place and place.

There is also a lack of empirical data that evidences how these non-places change over time and geography. Within the context of physical places, temporality, the sense of time, and rhythm have all been used as research themes in urban placemaking (see, for example, Ingold, 1993; Isaacs, 2001; Knox, 2005; Lynch, 1972). However, digital non-places as an explicit topic of research have only recently been considered in the literature, and specifically in urban design (Carroll, 2017; Hendry, 2014; Lammes, 2007). The relationship between digital non-places and both digital media and urban social time remains unexplored. This is perhaps hardly surprising given the complexity of the factors at play: Non-places under virtual reality superimpose digital content and information onto physical reality, generating digital activity patterns that are not synchronized with physical activity. The use of mobile electronic devices promotes distinctive, temporal narratives of non-place that may even create alternative city imaginaries. We have witnessed these trends through, for example, people's blurring of fictionalized places depicted in film and fiction, and augmented reality smart games into physical places (Tewdwr-Jones, 2011).

This article investigates placemaking practices that occur in non-places, with the aim of answering the following questions: (a) In the physical dimension, can the application of digital technology create a temporary place in a non-place, and what meaningful spatio-temporal patterns would this reveal?; (b) In the virtual dimension, how does the digital space created by social media sit with Marc Augé's definition of non-places, and is it possible to demonstrate that virtual communication can allow place and non-place transformations? In essence, the critical issue here is to understand whether people create a "place" without the existence of a physical space.

In Section 2, we discuss whether traditional notions of "non-place," which have been developed by Augé (1995) and used extensively by geographers and anthropologists, should be reassessed. The urban spaces that people experience have changed over the last 30 years and, despite being named "non-places," this term may no longer be appropriate to describe fully people's relationship with their surroundings. Section 3 presents the methodology and introduces the case study research, focusing on the degree to which it is possible to develop quantifiable and measurable non-place urban spaces through a quantitative experiment. Section 4 outlines the results with a focus on measuring the intensity and frequency of social media activity in city-specific non-places. The final section concludes by answering the research questions, highlighting the limitations of this study, and identifying avenues for further research.

2. Placemaking in Non-Places
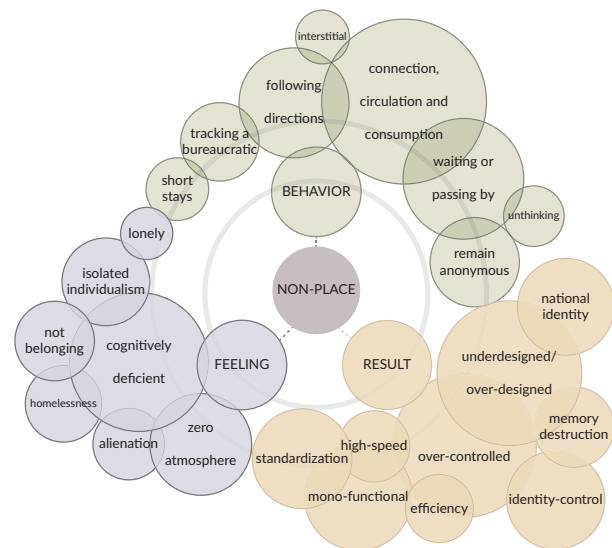
2.1. Non-Places: Manmade Atopia

Within the fields of architecture, cultural geography, and anthropology, a great deal of focus has been placed on the conceptualization of place. Much work in humanism has debated, redefined, and criticized our understanding of "place" (Cosgrove & Daniels, 1989; Cresswell, 2003; Daniels, 1993; Duncan, 1990; Matless, 1995). For example, geographer Yifu (1977) describes places as locations that are imbued with value through human experience and interaction, distinguishing them from mere physical space. Places are typically associated with history and shared social practices, making them sites of individual and collective identity. There were far fewer studies explicitly analyzing the notion of "non-place" until social anthropologist Augé (1995) refined the concept of non-place from a societal perspective in his seminal work *Non-Places: Introduction to an Anthropology of Supermodernity*. Before this, the notion of the embryonic form of the non-place appeared in the consideration of some authors, such as Merleau-Ponty (1948) and the architect Gruen (1964). However, Augé provided a definition of the concept that became more widely adopted in the literature.

Augé's conception of non-place is largely derived from its opposition to place. In his view, a place is characterized by sociality, dwelling, and landscape (Augé, 1995). By the same token, space is a "place" if it can be physically occupied, directly communicated with, defended, marked out, and thus become emotionally involved. However, Augé (1995) argues that supermodernity—a historical period marked by rapid change—creates "non-places." Supermodernity shows how standardization has taken hold, leading to the suppression of individuality. This leads to the opposite of the concept of "place" which confers a sense of belonging and fixity. Augé (1995) categorizes "non-places" as spaces of communication, consumption, and circulation that exist outside of identity, relations, and history. These spaces, typically airports and shopping malls for example, lack important cultural identity and have little or no attachment or memory for those who pass through them. Globalization has expanded the non-places, making them standardized, efficient, and anonymous, where people spend short, disconnected moments (see Figure 1). This "global sense of place," or in other words, the homogenization of society, is causing the differences that once characterized each city to disappear.

It can be argued that there are many similarities between Augé's "non-place" and the notion of "atopia." The word "atopia" is derived from the Greek prefix ἀ- (without, deprived of) and τόπος (place), indicating a space that is antithetical to a habitable place (Millet, 2013). It is also currently used to describe manmade atopias like airports, railway stations, and chain stores that interfere with the identity of individuals and communities. A classic example is the way international hotels operate. From the layout to the color of the towels, hotel chains worldwide are similar to induce an abstraction from the surrounding world. In the same vein, a 2000 *The New York Times* article accused a Starbucks that opened in China's Forbidden City of sharing the same decoration and advertising the same "glazed donuts, cinnamon rings, and banana walnut muffins" as the Starbucks in the United States (Smith, 2000). To build this Starbucks in the first place, the Forbidden Palace's Jiuqinfang building was remodeled, and its historical status and sense of place were replaced by a consumer space designed to be nearly identical to that of Starbucks worldwide. Thus, being trapped in a manmade atopia will ultimately preclude the variations produced by the individual's interactions with the local place, leading to the disintegration of humanism.
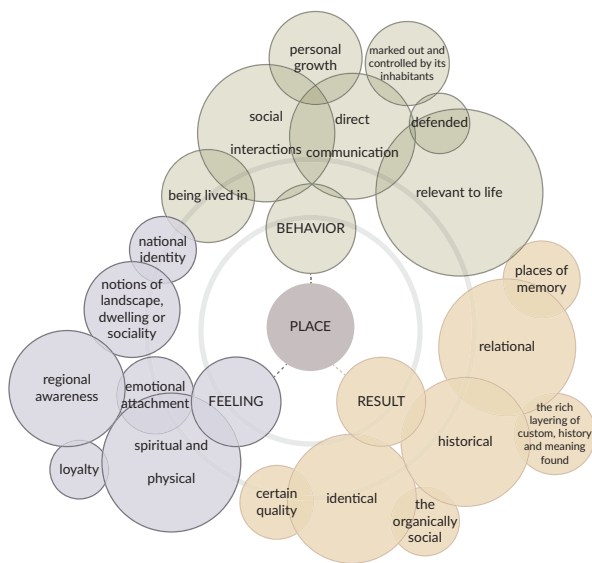
"place" (as an anthropological entity)   "non-place" (as an consumer-oriented funcional structure)

Figure 1. Different characteristics of places and non-places (the larger the circle, the more often the word appears). Sources: Author's work based on keywords collected from Augé (1995, 2017), Ayiter (2019), Carroll (2017), Cosgrove and Daniels (1989), Cresswell (2003), Daniels (1993), Duncan (1990), Grotius (2004), Matless (1995), Relph (1976), Spinne (2007), Urry (2000), Yifu (1977).

Augé's arguments have been challenged by a number of people. Harvie (1996) challenges Augé's assumption that non-place has no historicity. He argues that the perception of non-place is entirely subjective. Individuals can perceive any given location as a non-place or a crossroads of human relations. For instance, India is dotted with many British buildings constructed in the 19th and early 20th centuries. These historic buildings, which might not be "places" in the eyes of indigenous peoples, are or at least were "places" in the eyes of the British because their forms reflect capitalist social relations. Moreover, in *Reading the Everyday*, Moran (2005) uses the example of London's infamous M25 motorway to advance Harvie's theory. He points out that spaces like motorways, service stations, and airport terminals may present themselves to the traveler as unmarked spaces. However, to Britons who know their legal and cultural history, this flagship project of Margaret Thatcher's 1980s Conservative Party reminds them of the "destruction of the trade union movement" and the "industrial dereliction of much of the north of Britain." As Yifu (1977) points out, whether a place is a space, a place, or a non-place must be judged based on individual experience: "We are always at the center of our perceptual space and hence in place" (Relph, 1976).

From the perspective of this study, any space can be classified as abstract (waiting to be embodied), potential (waiting to be activated), and neutral (waiting for transformation). A change in the state of space occurs when a person enters the space and individual experience is incorporated into it. Thus, a non-place never exists in its pure form. The same location can simultaneously be a space removed from anthropological places for one person and a non-place for another. For example, shopping malls are often considered to be "non-places" as they are used for temporary, transactional purposes. However, for the salespeople who work there, these spaces become "places" full of personal and social meaning, as they conduct their professional and daily lives and build relationships within this environment.

2.2. Digitization: A Reclaiming of the Possibilities of Place From Atopian Non-Place

It should be noted that Augé's discourse on traditional "non-place" is being increasingly questioned with the advent of diverse media. These smart technologies mix the digital and physical worlds for a better user experience. The infrastructure of the physical world, background data, human activities, and network signals are all different levels of this hybrid space throughout the city. In this situation, the attributes of actual physical space seem to become less important for the nurturing of identity or a sense of belonging than before, as individuals' electronic connections with other places are increasing (Varnelis & Friedberg, 2008, p. 15). People can turn their bedroom into a remote meeting room or put on headphones to turn the airport lobby into a customized private concert hall. People who use a mobile device at a railway station gain a sense of belonging and identification. It is worth noting that non-places require personalized digital enhancement to provide the cognitive scaffolding that allows people to think beyond space. In London's Heathrow Airport, for example, travelers need to use supplementary hardware such as electronic diaries, iPods, mobile phones, and Kindles to compensate for non-place cognitive deficiencies. Unlike the aforementioned negative non-place, this phenomenon creates a positive manmade atopia. While people rarely associate airport terminals and shopping malls with opportunities for self-expression and creativity, cyberspace and social media have provided new ways of user engagement and community connection. For example, virtual public spaces provide citizens and social movements with new forms of political expression, thereby changing the forms of political participation and protest (Maireder & Ausserhofer, 2014, p. 305). Dispersed communities are simultaneously integrated through digitally-mediated communication, thereby promoting multi-site lifestyles and intimate relationships from a distance (Beck & Beck-Gernsheim, 2014, p. 12). Unlike the "pre-internet times," the "era of digitalization" came to extend the place for information, opinion, and debate to the private sphere (Riether, 2010). Media technologies such as mobile phones and laptops allow people to express their opinions publicly without gathering in a specific physical place. This behavior contributes to the segmentation of perception and reduces the connection to the physical public space. As a result, the former role of public space as a primary site for information exchange and political discourse has diminished, thereby reducing its significance.

Meanwhile, cyberspace and social media have also made public space become a private space in the digital sense. It could be argued that digital labor additionally produces new forms of exploitation, flexibility, and freedom, blurring the boundaries between the workplace and private places (Brynjolfsson & McAfee, 2014, p. 28). Also, a system of automated, dynamic, nuanced, and subjective filters and controls becomes the method through which users regulate spatial boundaries via parameter control, leading to temporary, hierarchical, and subjective concepts of public and private spaces (Eriksson et al., 2007, p. 31). Each device user's dynamic and customized space completely overturns Kevin Lynch's concept in *The Image of the City* (Lynch, 1960, p. 86). The spatial structure can be abstracted into five elements, namely edge, node, path, district, and landmark, all due to the invariability of the original physical space, which may no longer exist in virtual non-places. For instance, an ordinary store will not be regarded as a landmark in *The Image of the City*. Still, in digital mapping software, the store may be rendered in front of Google Maps users by a digital marker or marked as an important node on the map. In this situation, virtual non-places turn public mapping into a private and customized action, and the original concept of public space has eventually been shaken.

For Augé, a place is an anthropological place characterized by history, relation, and identity (Augé, 1995, p. 51). Therefore, a space that cannot be defined as historical, relational, and concerned with identity is then

a non-place. The development of cyberspace is sufficient to critique the above view. First, upon early encounter, the meta-spaces are a construction of solitude, blankness, anonymity, and consumption. They are devoid of personality and memory. Nevertheless, users create personal profiles and spend a large amount of time and resources in the meta-space, leading to the creation of highly personalized virtual "places." At the moment, the digital world is no longer seen as an illusory space used to escape reality, as people are able to complete their daily necessities online. Using platforms such as Zoom, Teams, Skype, WeChat, and X can give rise to new forms of work and learning and even facilitate multi-location lifestyles and long-distance intimacy. Therefore, there is no shortage of "relation" in the meta-space. In addition, Instagram, Foursquare, Facebook, and other social media platforms are full of memories and significance, and encourage users to record their personal lives on them. Personal information, data, and texts are injected into the meta-space as content from the day is uploaded. It is evident that meta-space can be defined as "historical." Finally, each device user's dynamic and customized space has led to temporary, hierarchical, and subjective concepts of "public" and "private" places (Eriksson et al., 2007, p. 31). These places, which reflect people's daily activities in the city, are marked as their "favorite" placemarks on Google Maps and given unique names and routes colored in. These annotations provide a personalized way for users to understand and record their life trajectory in the city. This customization of urban space through personal experience can be viewed as a reorganization of the digital map. It inadvertently renegotiates the authority of urban planning and zoning and emphasizes the user's personal identity. In *Remediation*, Bolter and Grusin (1999) project the concept of non-place in cyberspace. They formulate the identity of non-place as dynamic, like a chameleon, absorbing other identities to create its own. Thus, there is no shortage of "identity" in meta-space. Augé (2017) revisits the term and defines non-places in his book *L'Avenir des Terriens*: "In short, the places I used to call non-places are now the potential link of every possible space" (p. 40). He suggests that digital spaces, much like physical non-places, offer a paradoxical mix of isolation and connectivity. In line with the views of this study, Augé agrees that these digital environments may lead to a redefinition of personal identity and social practices, reflecting both the alienation and the possibilities within modern life.

The question posed in this article is whether the digital space accessed is, in fact, a "place" that may supplement some of what has been taken away from us in our supermodern public "non-places." Considering that digital non-places are invisible to the naked eye, the research methodology adopted in this study is not limited to visual and material forms, instead shifting attention to tempo, patterns, and experiences. The supermodernity proposed by Augé requires a renewed methodological reflection on the category of otherness (1995, p. 24), whose driving force includes the transformation of people's concepts of time, space, and daily life. The place is seen as ephemeral, sensory, and performative (Massey, 2005; Seamon, 1980; Thrift, 2003; Wunderlich, 2014, p. 62). This is reinforced by the fact that spatio-temporal boundaries have slowly disappeared as a result of everyday life in digital space, exacerbating this sensorial, transient, and temporal phenomenon and blurring the distinction between place and non-place. The significance of the sense of time and the perceived rhythmicity of places in shaping the quality of people's temporal and sensory experiences in urban spaces has long been recognized (Ingold, 1993; Massey, 2005; Thrift, 2003). According to Wunderlich (2013), urban design themes such as placemaking, urban identity, and relationships can be analyzed in terms of time, which suggests that non-places can also be spaces with history, relation, and identity.

3. Methodology

3.1. Research Approach

This study proposes a new method for observing the transformation process of urban places and non-places from location-based social media data. In order to explore the transformative processes of non-places and places, this research demonstrates that digital technologies can endow non-places with identity, relationality, and historicity by creating interactions and personal experiences. While the digital age has given rise to many online technologies, it is social media platforms that facilitate and create a data source of interactions and daily memories in a virtual space. These data sources include those that are publicly visible (such as comments under a YouTube video, "likes" on Facebook, and shared content like photos, blog posts, etc.), and data that are hidden (such as website search history and phone calls), both of which leave digital traces. In this context, digital traces are "records of activity left by individuals when they interact online," which allows researchers to observe users' social behavior in real-time (Keusch & Kreuter, 2021).

This study focuses on London. On the one hand, London's urban space contains many non-places in its physical dimension. London's shopping centers and transport hubs (airports, train stations, and tube stations) are the epitome of a modern, globalized city. The efficient and standardized design of public spaces obscures personal sub-narratives. Retail chain stores, which are common across many large cities, have resulted in a form of urban homogenization, sometimes referred to as the "McDonaldization" of cities (Ritzer, 2008). Conversely, a study by BroadbandUK (2022) has revealed that London is the most online-obsessed area in the UK: The city has the highest broadband usage per household and uses 11% more than the national average. Three South London boroughs are among the UK's top 10 most active social media usage areas (Hyde, 2021). Admittedly, London is not representative of all cities, but it is nonetheless a useful example to analyze what the era of digitalization has brought about in cities.

3.2. Methods

This study utilized quantitative geo-tagged social media data. Specifically, this research relied upon social software streaming APIs to gather geo-localized social text content in near real-time. When users send social text or images, the social software automatically tracks and records their latitude and longitude to determine their geographical location. While some users do not send tweets or photos immediately in situ and on-site, they tend to give additional location context or add a location tag to the text after they arrive home. Therefore, to ensure accuracy, this work disregards location tags and textual content, and instead collects social text content based solely on the backend records of the user's geographical information in real-time. For example, when GPS positioning is enabled, social content that mentions "Hyde Park" or sets "Hyde Park" as a location tag will not necessarily be collected. Social content for this case would only be collected if the user uses the social software within Latitude: 51.508610, Longitude: −0.163611, Radius: 0.42 miles (which is, of course, the exact geographic location of Hyde Park).

Due to privacy concerns, GPS and mobile phone tracking data can be difficult to obtain even for research purposes. Therefore, social media applications that provide geo-localized information are somewhat limited. Previous literature has suggested that X, Foursquare, and Instagram often prove to be the richest sources for contributions containing data (Arjona et al., 2021; Ciuccarelli et al., 2014; Martinez & Martinez, 2014).

Therefore, the study used Python code to collect social text content from X, Foursquare, and Instagram via the streaming API. The data collected in this study included (a) the number of geo-tagged contributions/check-ins within the case study regions in a predefined period, and (b) the trend of user contributions on social media over time.

3.2.1. Case Study 1: Spatio-Temporal Patterns of User Activity

Case Study 1 visualizes the distribution of people's digital activities within non-places and places, and its peaks over time. Six different locations in London were chosen: (a) St. Pancras International Station, (b) London Heathrow Airport, (c) Westfield Shopping Centre Stratford City, (d) Hyde Park, (e) Regent's Park, and (f) Natural History Museum and Victoria and Albert Museum (see Figure 2). Based on the literature review, St. Pancras International Station, London Heathrow Airport, and Westfield Stratford City are the railway station, the airport, and the shopping center, respectively. They are typical non-places. Hyde Park, Regent's Park, and the Natural History Museum and Victoria and Albert Museum are typical places. The primary reason for choosing these six locations is their function as either archetype places or non-places, but also because they all have a vast footprint. The real-time geolocations collected through the streaming API are based on the size of an area. Therefore, the larger the radius around a point, the more data is collected. Moreover, St. Pancras International Station is connected to Eurostar rail departures; London Heathrow is the UK's largest airport; Westfield Stratford City is a popular stopover for those traveling to Queen Elizabeth Olympic Park and is also close to the high-traffic Stratford transport hub; Hyde Park and the neighboring Regent's Park are the largest green spaces in central London; and the Natural History Museum is adjacent to the Victoria and Albert Museum and the Science Museum.

The research began with geo-referenced public tweets gathered from the X APIs. Based on the latitude, longitude, and radius entered, it is possible to retrieve 100 tweets sent from a particular geographic location from the previous seven days. Case Study 1 involved a three-month data crawl, focusing on tweets from 1,260 active users between June 14 and July 14, 2023, February 14 and March 14, 2024, and June 5 and July 5, 2024. To complement the data from X, Foursquare and Instagram were also utilized as geospatial social media platforms. Unlike X, where tweets can be retrieved based on both location and a specific time frame, Foursquare allows location-based searches but lacks a mechanism to control the temporal aspect of the data. As a result, check-in data collected from six locations correspond to different time periods, leading to variations in the amount of data obtained. Instagram's statistics are partly based on data collected through the streaming API, and partly data that were manually retrieved. For users who have voluntarily enabled Instagram's geo-localization service, their posts include precise timestamps and locations, revealing their movements through the city. A three-month data crawl was used on Instagram from 800 active users in the same time frames as those studied for X activity. Entering the location allowed the researchers to browse through all Instagram posts made at that location in recent weeks and manually categorize them into different times of the day based on when they were posted. Generally speaking, when scholars try to collect people's activities in a physical dimension, it is often necessary to do fieldwork and be physically present. Nonetheless, given that digital activities are intangible and difficult to capture with the naked eye, most collection efforts must rely on streaming APIs. However, the manual search process allows for observing the individual motivations of users using Instagram to post information.
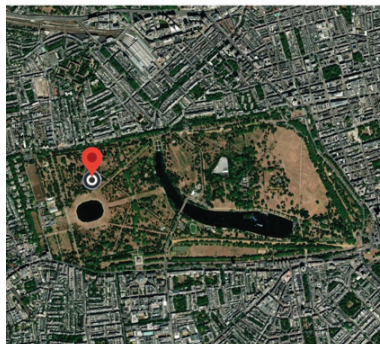
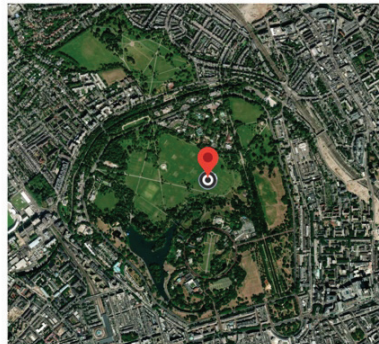(a) St. Pancras International Station
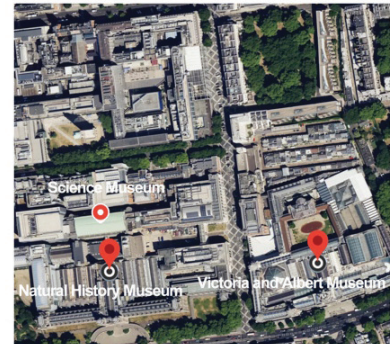
(b) London Heathrow Airport
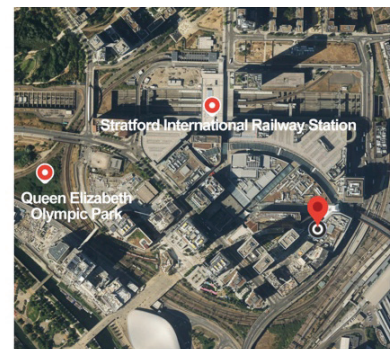
(c) Westfield Shopping Centre Stratford City

(d) Hyde Park

(e) Regent's Park

(f) Natural History Museum and Victoria and Albert Museum

Figure 2. Geographical location of the six sites. Source: Authors' work based on maps collected from Mapbox (2024).

3.2.2. Case Study 2: Assessing the Relation to Non-Place Through a Diversity of Media

Case Study 2 categorizes non-places further. Four different London railway stations were chosen. They are (a) St. Pancras International Station, (b) London Victoria Station, (c) Charing Cross Railway Station, and (d) Euston Railway Station (see Figure 3). The primary reason for choosing these locations is that these stations are the most common non-places with which people come into contact daily. Transportation hubs such as railway stations and metros are spaces filled with textual information (Gaste & Gentes, 2013). In addition to signs and posters, people interact with newspapers, books, and smartphones. Many tourists perform digital activities such as gaming, communicating (social media, SMS, phone calls), and reading the news when traveling. In most cases, when traveling by train, they isolate themselves from the rest of the world and create their own personal spheres in non-places. Modern airport terminals and train stations often look the same in cities; the only thing differentiating the traveler's experience is their individual digital activities.

In the controlled case study, St. Pancras International Station and London Victoria Station are categorized as the first group, and Charing Cross Railway Station and Euston Railway Station as the second group. The stations in the first group are connected directly to airports (London Luton Airport and London Gatwick Airport), and the stations are designed like shopping centers with extensive infrastructure (cafes, restaurants, shops). The stations in the second group do not connect directly to an airport and have less infrastructure. Case Study 2 was used to verify (a) whether train stations connecting to airports and containing shopping centers have more frequent digital activity, and (b) whether the reason people are willing to talk about a certain area on social media apps is related to the richness of local infrastructure.

A St. Pancras International Station

B London Victoria Station

C Euston Railway Station

D Charing Cross Railway Station — Route to the airport

Figure 3. Geographical location and interiors of the four London railway stations. Sources: Authors' work based on photos collected from (a) "What are they building" (2024), (b) Travellers Toolkits (2024), (c) Patuffel (2018), (d) SpaceandPeople (2024).

4. Results

Figure 4 presents the difference in the intensity of rhythm of digital activity between non-places and places and shows that this is not stark. Hyde Park has a much higher frequency of tweets than the other sites. However, the frequency of digital activity for non-places and places is broadly equal. Regarding digital activity on Instagram, London Heathrow Airport has a higher level of user activity than Regent's Park and the Natural History Museum and Victoria and Albert Museum. There was even a peak at London Heathrow at 3pm in X's digital activity. Several studies have speculated that people tend to use social media in places rather than non-places. Erwin Goffman's theory of social interaction shows that people curate their self-presentation more in meaningful settings (places) because they feel a stronger sense of social interaction (Goffman, 1956). Places tend to mean more social activity and the generation of more memories to share, leading to users being inclined to comment on others' opinions or share their own photos. Secondly, many social media platforms, especially Instagram or Facebook, emphasize location-based sharing (Ciuccarelli et al., 2014). People often tag or share their location when they are in places with emotional or social relevance (e.g., a family gathering in the park, or visiting a museum). Furthermore, Christopherson (2007) states that people tend to engage in more passive online behaviors in anonymous or transitional spaces. However, the results show that while people engage in digital activity in places with a high frequency, it does not open up a significant gap with digital activity in non-places. In summary, this observation found that the duration, intensity, and number of events comprising people's non-place use of social media are higher than expected. From one vantage point, this result confirms the hypothesis that non-places accelerate people's adoption of digital technologies. Digital technologies stimulate the desire to express and share in non-places. In addition, the difference in the frequency of physical activity between non-places and places is more pronounced, as shown in Figure 5. It shows that London Heathrow Airport receives the most visitors per year, followed by the Natural History Museum and Victoria and Albert Museum, and Westfield Stratford City. In contrast, although the number of visitors to the parks is the lowest per year, the visitors to Hyde Park post social media content much more frequently than the other locations. This indicates that both parks and museums are "places," and although museums have a much more mobile population than parks, people can experience a stronger sense of social interaction in parks.
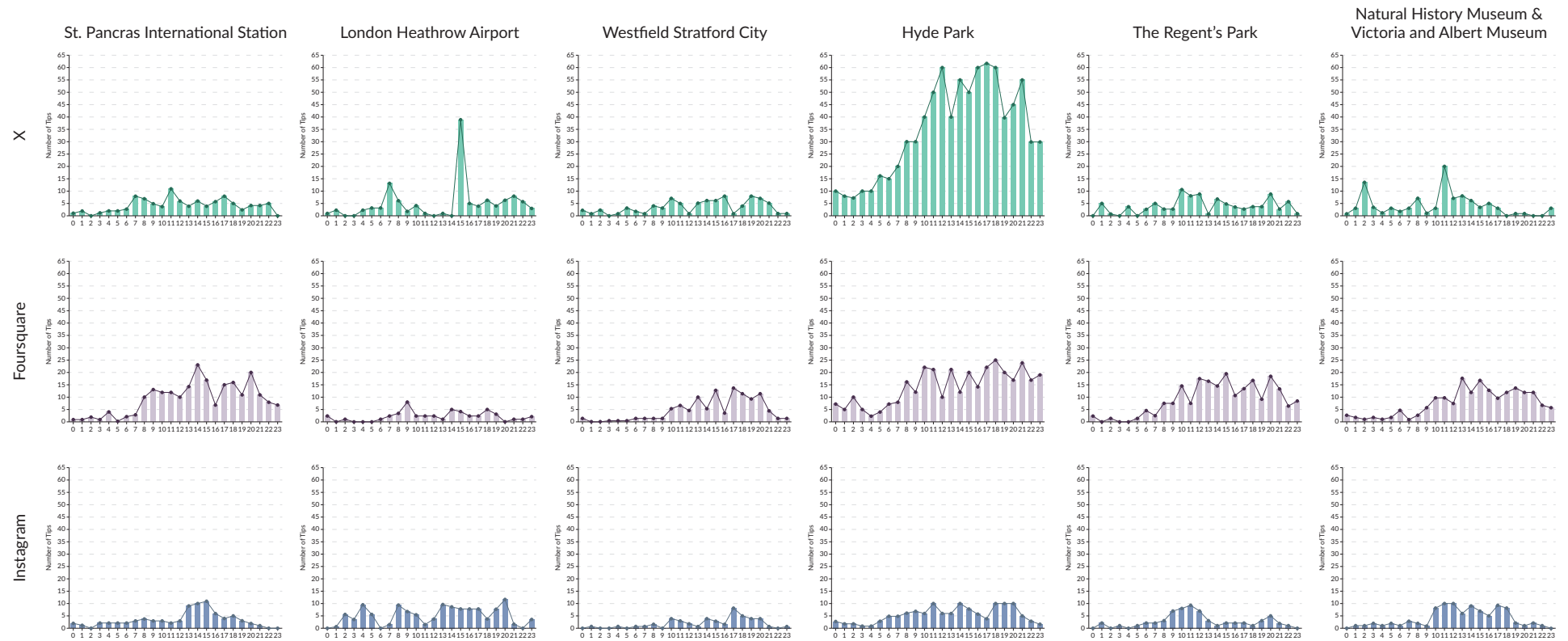
Figure 4. The intensity and rhythm change of digital activity in time as analyzed through X, Foursquare, and Instagram at six locations.
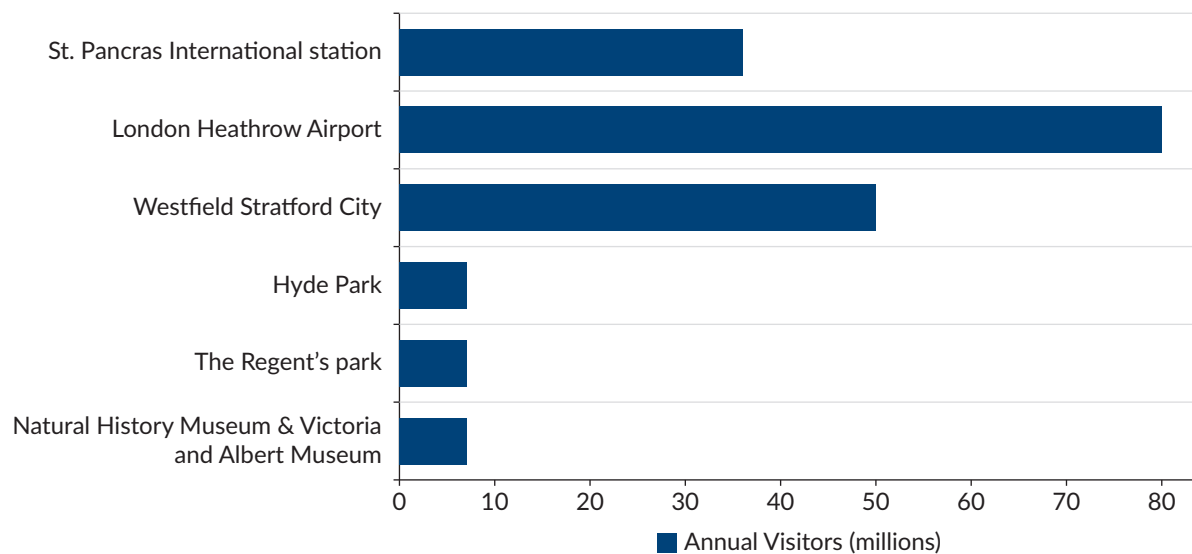
Figure 5. Number of visitors per year to the six locations (in millions). Considering data limitations, this study has compiled data from 2018 for St. Pancras International Station, London Heathrow Airport, Westfield Stratford City, and the Natural History Museum and Victoria and Albert Museum, along with 2014 data for Hyde Park and Regent's Park. Sources: Association of Leading Visitor Attractions (2018), Heathrow Media Centre (2019), Natural History Museum (2019), Office of Rail and Road (2020), Statista Research Department (2014), "Westfield Stratford city welcomed" (2018).

Figure 6 presents the variation in digital activity on three social media platforms in six locations over the course of one day. The scale of digital activity at St. Pancras International Station is focused between 7am and 8pm, with a peak in the activity between 11am and 2pm. London Heathrow Airport's digital activity ebbs and flows, as might be expected from a 24-hour airport. Compared to the train station, the digital activities happen slightly later in Westfield Stratford City and mainly between 10am and 8pm, corresponding to the opening hours of the shops in the mall. The peak occurs at 3–7pm. User activity in Hyde Park and Regent's Park exhibits less variation and reaches a long-lasting plateau. The peak at the Natural History Museum and Victoria and Albert Museum occurs at 11am–3pm, after which a steady decrease occurs.

Figure 7 shows the distribution of digital activity (left) and physical activity (right) and their peaks over time. The left side of each group of graphs shows the average of the frequencies of the three social media platforms over 24 hours, including the period of the day when people are present and active in these locations (x-axis) and the peak of the intensity of digital activity (y-axis). The right-side graphs in each group are derived from Google Maps' predicted "busy times" data, which reflect activity levels at various times throughout the day. Due to the limited Google Maps data, the graphs on the right show only when people are present and active at these locations. The rhythm of physical activity in the six locations is relatively flat, with only one to three peaks during the day. In contrast, the rhythm of digital activity is full of ups and downs, often accompanied by multiple peaks. Overall, the difference in the intensity of rhythm is stark and vivid, presenting considerably different patterns. The results confirm that there is a rhythmic difference between digital and physical activities in non-places. The rhythm of digital activity is unique and unaffected by the factors that influence the rhythms of physical activities. Whether a space is a non-place or a place, it is not open 24 hours a day in the physical dimension. Therefore, physical activities only occur during concentrated periods. However, digital activity occurs 24/7 in the virtual dimension, which results in several peaks of digital activity that do not coincide with the peaks of physical activity.
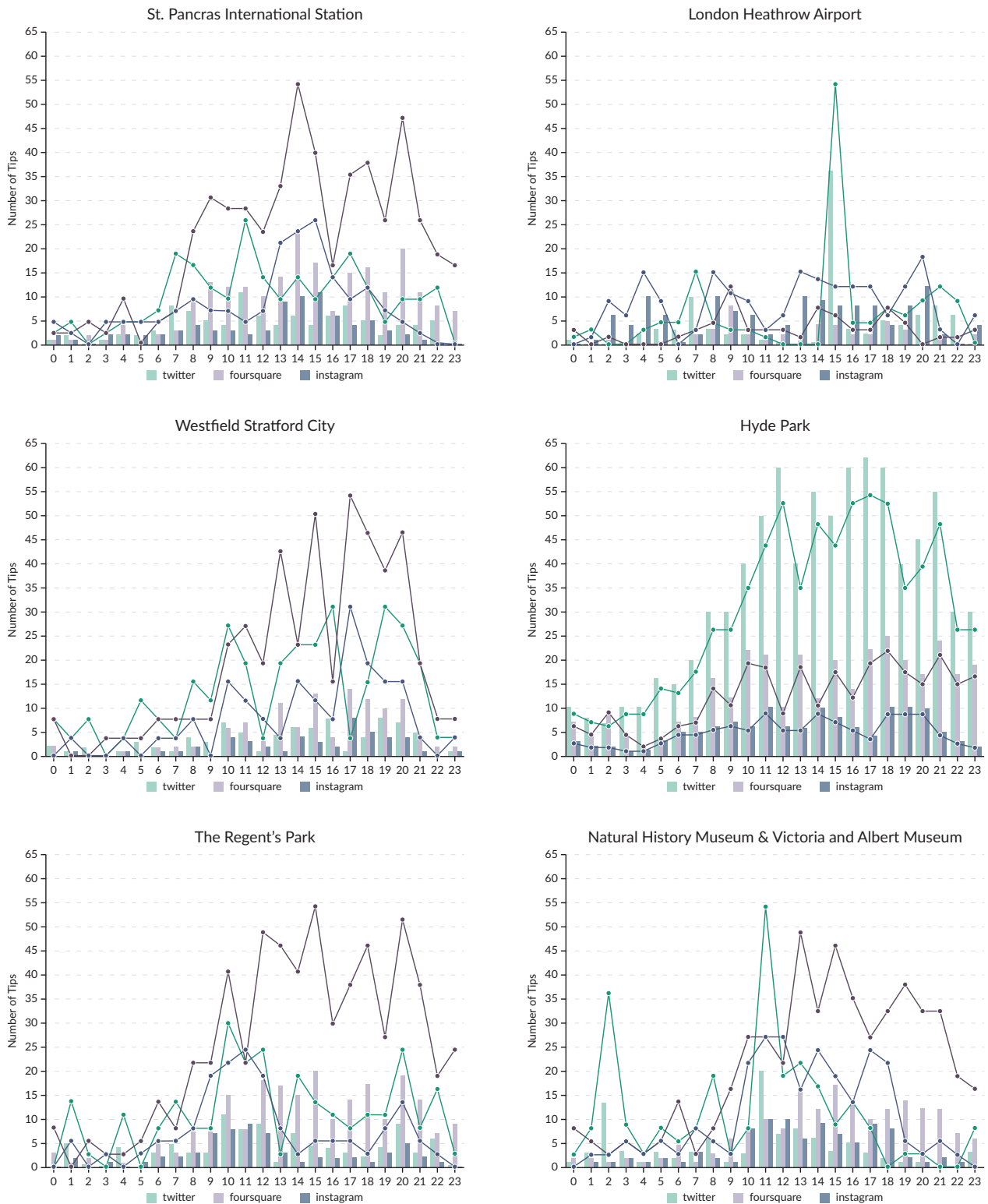
Figure 6. Variation in digital activity on three social media platforms in six locations over a single day.
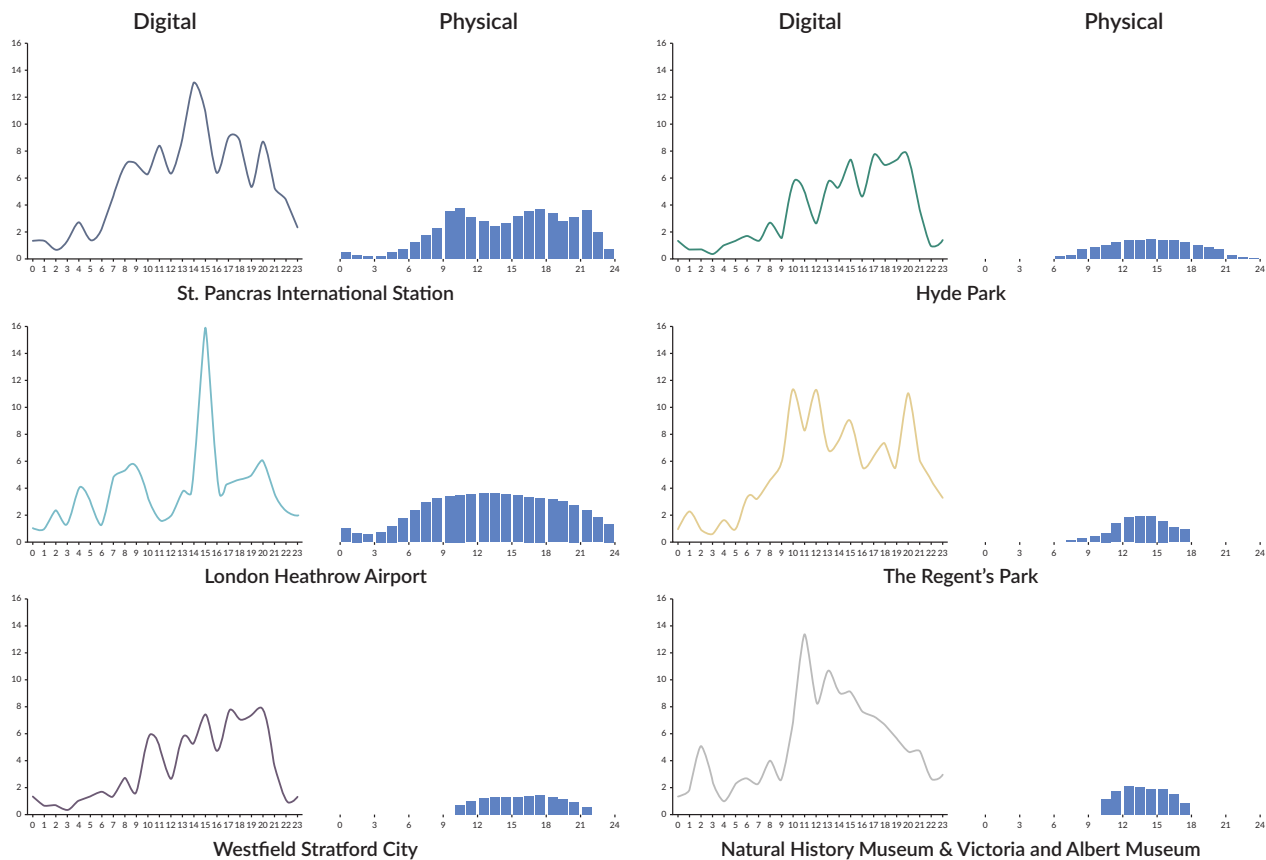
Figure 7. The distribution of digital activity and physical activity and their peaks over time, based on Google Maps' "busy times" data.

Figure 8 shows the daily digital activity patterns for four London railway stations. The vertical axis of each graph corresponds to the number of people using social media. The horizontal axis corresponds to the 24 hours of the day. Taking the top left graph as an example, the black line is the variation in the average pattern of digital activity on X at all four railway stations throughout one day (similarly, the black line in the bottom left graph is the average pattern of digital activity on Foursquare at four railway stations over a day—and therefore is the same in each row). The solid red line shows the frequency of digital activity at St. Pancras International Station and the dashed red line shows the frequency of digital activity at London Victoria Station. Areas shaded green show where a railway station's digital activity exceeds the average, while areas shaded red show where it falls below the average. These results show that on X and Foursquare, digital activity at St. Pancras International Station and London Victoria stations is above the average of the four railway stations, while the Euston and Charing Cross stations are below the average most of the time. It appears that train stations connecting to airports and containing shopping centers have more frequent digital activity, but this may be but two factors related to the functions and locations of those stations.
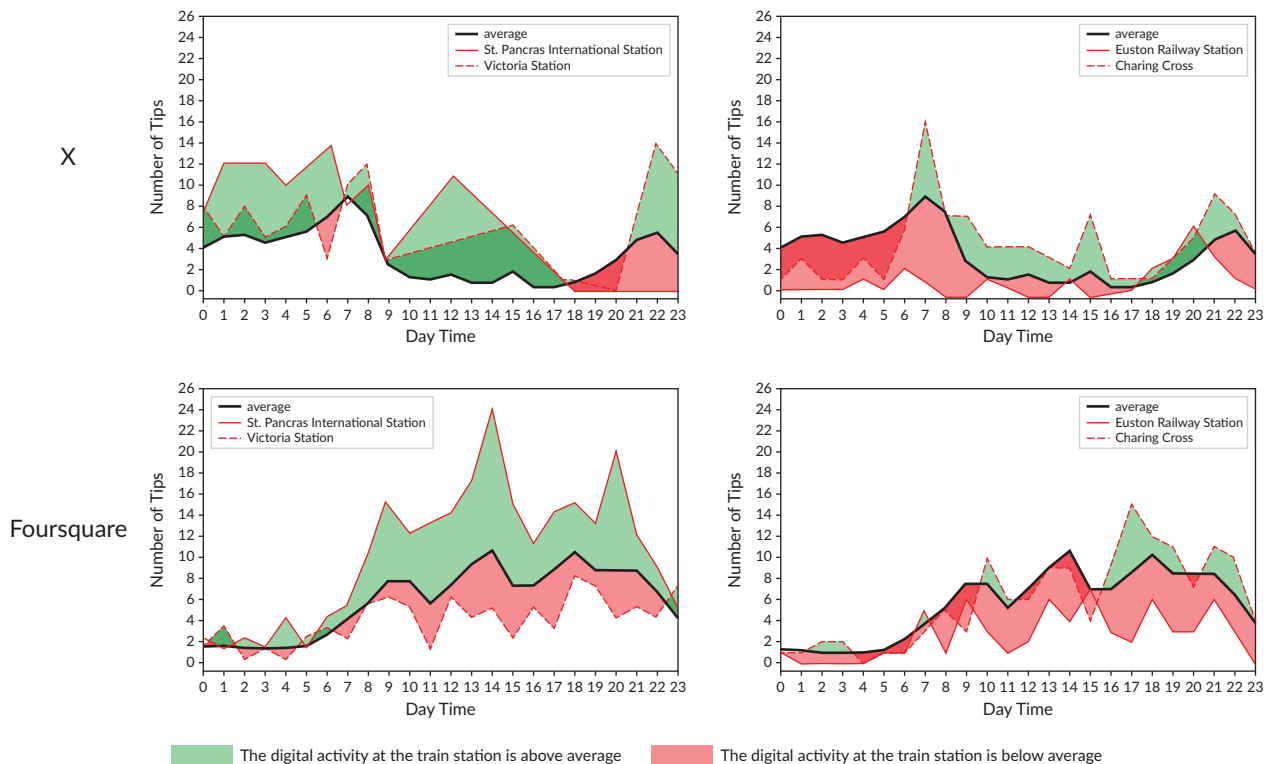
Figure 8. The daily digital activity patterns for four London railway stations.

5. Discussion and Conclusions

The above results reveal that with the development of digital media, non-places have become the multi-complex spaces of the city. In the virtual dimension, Case Study 1 indicates that virtual communication can enable transitions between non-places and places. The application of digital technology can create a temporary place (media micro-environment) in a non-place (train station, airport, etc.). The results of Case Study 1 support the hypothesis that non-places accelerate people's adoption of digital technology, and that digital technology stimulates people's desire to express and share in non-places. Therefore, the use of social media in non-places can generate countless temporary and meaningful "places" in a "non-place" that may lack emotional, historical, or cultural connections. In this situation, digital content and information are overlayed onto the physical world. Unlike Case Study 1, Case Study 2 discusses whether the application of digital technology can create a temporary sense of place within non-places by improving users' emotional attitudes towards non-places in the physical dimension. The results of Case Study 2 suggest that digital activities are more frequent in railway stations that have more infrastructure that generates social interaction. For instance, many tourists will take a picture of themselves on the Harry Potter platform at King's Cross Station and post it on social media. This station has always been a "place" for Harry Potter fans. However, King's Cross Station may be just an ordinary railway station for a commuter, notwithstanding the station's age, architecture, and history.

On this basis, we emphasize that people's emotional attitudes towards non-places could transform them into meaningful places within the urban environment. People's motivations for coming to non-places affect their emotional attitudes towards non-places. Someone may feel great after consuming a meal at a restaurant at

St. Pancras Station, so they may take a photo and post it online. This behavior, in turn, may result in others, who see the social content, to visit the railway station with the intention of checking out the restaurant, rather than seeking out an alternative at a different location. Visitors may use photography in a celebratory and memory-inducing way to maintain their relationship with the culture of this non-place. So-called "significant locations" are photographed or commented on, allowing the non-place to be imbued with a new relationship. Photographs and social comments uploaded by visitors are proof of people having been actually present on-site in order to capture the occasions and transform them into a digital story. In most cases, non-places are seen as waiting areas or passing spaces where people simply pass by or stop for a short time. However, the infrastructure within the non-place (e.g., shopping malls, restaurants, and cafes in railway stations) allows people to treat the non-place as a destination, changing the motivation for people to visit it and spend time there. Social media allows people to share their experiences and stories in this space, giving the non-place a new identity (not a transport hub but a place full of memories) and turning it into a temporary "place."

We have explored placemaking practices occurring in non-places as well as users' self-generated spatio-temporal perceptions, by examining distinctive temporal narratives in digital spaces. The two case studies show that transitional spaces may influence smartphone usage and social media engagement, and the use of digital platforms can, in turn, affect the rate of temporal flow in urban public spaces. In addition, the daily rhythms of urban public spaces are influenced by a combination of digital and physical activity rhythms. Non-place rhythms are more susceptible to the frequency and duration of mobile device use in digital spaces. The study corroborates Stylianou-Lambert's (2012) view that diverse media technologies are tools for constructing identities and relations. However, in the two case studies, digital technology was found not to endow non-places with identical, relational, and historical characteristics. Social media simply facilitates the spread of news by sharing photos and comments, thus accelerating the transformation between non-place and place. Instead, people's perceptions and attitudes toward the non-place give it a new identity or at least a relation.

This study has involved only two cases in a single city. Caution must therefore be exercised in generalizing the conclusions and lessons. But there are some critical and methodological issues that arise from the work. First, we acknowledge that this study has been based on one city at one moment in time. Although it has attempted to provide an initial research study about user-generated space in urban settings through the lens of non-space, we are aware that similar studies in other locations may generate different findings. The urban pattern, the configuration of buildings, services, and open spaces, the impact of policies and regulatory decisions, and the accessibility of places for different purposes and their use digitally and non-digitally by different societal groups, may all affect how places are and how they are perceived.

Secondly, the range of real-time geolocation data collected using the streaming API of social software needs to be sufficiently granular. Social media data streams provide data based on a certain range of an area from a single point, but sites are often more rectangular or irregularly shaped. As a result, the final measured area may not accurately represent the selected location. For example, the number of Foursquare postings continues to rise even after the museums close since some users visit the bars and restaurants on streets adjacent to the museum. The APIs used can only control geolocation, but the timeframe for collection is 24 hours a day. Therefore, it is expected that during the time the site is closed, if someone inside that geolocation is still using social software, it will still be collected. This results in the number of geo-targeted contributions within the

case study regions collected by this study being slightly larger than the actual number within the predefined period. However, considering that the coverage error of the final measured area is only within 1%, the error is acceptable. For example, Hyde Park is an irregular shape of 142 hectares. The area collected by the study is a circle with a radius of 0.42 miles which covers an area of 143.53 hectares.

In addition, GPS accuracy in personal devices is limited, and indoor GPS data is even less precise, meaning that social media platforms may only generate approximate locations. Moreover, different social media data contain different biases. On X, bias is associated with uncertainty about both location and semantic information, as X users usually refer to past or future events rather than reporting an ongoing situation (Steiger et al., 2015). Conversely, Foursquare is primarily used for sharing real-time geolocation information and "check-ins." However, check-in data contains both place and age group biases (Sun et al., 2016). For instance, users check in more frequently at commercial locations, and check-ins are predominantly made by younger demographics.

These biases affect the results of this study in two key ways: (a) In Case Study 1, the number of geo-targeted contributions within Westfield Stratford City will be slightly larger than the actual number. (b) The age distribution of active users also skews the dataset. According to 2024 and 2025 user statistics, the 25–34 age group has the highest penetration on both X and Foursquare, while individuals aged 64+ in the UK do not use Foursquare at all (Metev, 2024, para. 3; Woodward, 2025, para. 2). Similarly, Instagram's global active user base is predominantly between the ages of 18–34 (Dixon, 2024, para. 1). As a result, the statistical findings of this study are more representative of younger demographics (18–34 years old), which are the primary target audiences of X, Foursquare, and Instagram. However, it is important to acknowledge that these regular social media contributors do not fully represent the broader population.

Finally, the specific setting of the mobile device from which a user accesses social media platforms can also affect the accuracy of the statistics. For instance, not all users have a data plan with their mobile operator. Some visitors to the city may prefer to post on social media after returning to their accommodation when they may have access to a free Wi-Fi network. In these cases, they may still travel with their smartphone and use it in non-places, but we are unable to capture these digital activities. Obviously, the distribution of Wi-Fi networks in the city influences the geographical dimension of the social media analysis, as massive contributions may occur in areas with more accessible and reliable or even free Wi-Fi networks. Selecting London as the case city for research has somewhat reduced this limitation. As mentioned earlier, London is the most online-obsessed area in the UK. All the selected research locations, even Hyde Park, are popular places and possess free Wi-Fi. However, it is crucial to acknowledge the existence of data poverty and lack of access to digital infrastructure in certain regions. Many areas, especially in developing, suburban, or rural areas, face significant barriers to collecting and using high-quality data due to insufficient infrastructure, inadequate or unaffordable digital connectivity, and limited technological resources. These issues hinder the adoption of data-driven strategies and exacerbate inequalities in urban development. Future research should refine the proposed framework and test its applicability in different urban contexts. In particular, the development of cost-effective data collection methods and the promotion of international cooperation could mitigate these gaps and ensure more inclusive urban development.

Overall, the use of digital technology in public spaces in the city is increasingly blurring the boundaries between what might be thought of as a place and a transient non-place. As some of these transient places become

destinations in themselves, they increasingly take on greater uses and have a greater impact on those visiting or using those spaces. Given the proliferation of digital media, the accessibility of personal technology, and the widespread presence of physical media screens, it is not surprising that the public will start to imbue non-places with a sense of meaning and relevance and, in turn, memory, which in some cases may be highly personalized. The relevant questions for the future are not only how we may research, capture, and assess these changes to the way we navigate and use the city, but also whether digitally personalizing places is an activity restricted to certain age groups, genders, and ethnicities. This, in turn, may privilege access to and use of urban places for some people, but certainly not all.

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Conflict of Interests

The authors declare no conflict of interests.

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