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Smart City Communication: Analysis of the Engagement Between the Residents and Visitors of the City

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Abstract

A smart city aims to transform urban infrastructure and management processes by utilising innovative technologies, increasing citizen participation and interaction, thereby making the city more attractive to live in and visit. The primary objective of this research is to identify ways in which smart cities can enhance social media usage. The research analyses the interaction of smart city visitors and residents in Turkey. Within the framework of network society theory, it has changed, acquiring a quality that supports cultural participation and interaction. The aim is to obtain findings related to participation and interaction within the scope of smart cities and to evaluate these findings with the aim of contributing to the management of smart cities, city branding strategies, and applications. This research measures the connection between smart city residents and visitors in terms of the popularity, engagement, and loyalty elements of social media content. Based on these elements, the Instagram accounts of fourteen smart cities in Turkey were examined using content analysis techniques. It has been determined that smart cities have achieved underdeveloped levels of social media connectivity by using the Instagram social network. Consequently, it has been determined that it is important for local authorities to identify potential visitors who may visit the city for reasons such as work, events, or seeing relatives in their social media content as a higher priority target audience than the city's residents.

Keywords: Smart City, Social Network, Engagement, Participation, City Branding.

JEL Codes: L88, M31, Z32

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1. Introduction

The smart city concept has traditionally focused on technologies for sustainable economic development. This focus is "a framework for policies supporting technological and ecological urban transitions" (Vanolo, 2014: 884). At the same time, information and communication technologies (ICT), which are constantly evolving and affecting cities, are both a driving force for innovation in cities and a tool that guides the effective management of services. The literature on the subject emphasizes that community, policy, and technology are the driving forces behind smart cities. Furthermore, results are sought in areas such as productivity, sustainability, accessibility, wellbeing, livability, and governance (Molinillo et al., 2019). Some contend that the integration of technology, specifically artificial intelligence, with human intelligence can enhance urban development strategies. In contrast, others argue that enhancing local brand value contributes more to cities' competitiveness than technological advancements (Harrigan, Eversi, Miles & Daly, 2017). A city brand identity centered on a smart city concept necessitates promoting collaboration between administrators and managed entities while encouraging stakeholders' engagement. The notion of a smart city is understood in multiple ways, often framed through terms like digital, connected, wired, learning, as well as green or sustainable within its paradigm. There is no universally reknown single definition for the term (Cochia & Quaglia, 2014). Caragliu and Nijkamp (Capello, R., Caragliu, A., & Nijkamp, P. 2009) emphasized that the concept of "Smart City", as a label, should refer to intelligent solutions that enable modern cities to develop through quantitative and qualitative efficiency improvements. Attempts to define the concept and discussions from different perspectives draw attention to the social and technological aspects of smart cities.

The term "smart," when used in reference to cities, refers to urban areas and tourism destinations that incorporate innovative technologies into local governance processes and implement essential initiatives to enhance the tourism experience and services, while also offering a diverse range of activities and improved quality of life for stakeholders (Gretzel, Werthner, Koo & Lamsfus, 2015: 560). Smart cities have also introduced the concept of smart tourism destinations, with smart approaches signaling experience-focused efforts to enhance visitor experiences (Gretzel, Werthner, Koo & Lamsfus, 2015: 560). In smart cities, interaction between city residents, visitors, and other stakeholders takes center stage. However, this importance forms the basis for an approach that is valid for both smart cities and other cities. The interaction of all city residents and visitors with the city brand is particularly related to contributing to every aspect of the city through blog posts, social media content, discussions in online communities, or simple comments on websites (Braun, Kavaratsiz & Zenker, 2013: 24).

This perspective aligns with the views of Manuel Castells, who argues that communication has shifted towards mass self-communication with digitalization Castells (2016: 1). Castells describes mass self-communication as a new type of communication that differs from both interpersonal and traditional mass communication, yet has the capacity to reach global audiences. In this model, the message is produced by the individual, the target audience is determined by the sender, and the selection or retrieval of particular content from electronic networks is carried out by the users themselves. Therefore, in addition to promoting cities and increasing engagement with key stakeholders (Zhou & Wang, 2014: 27-32), social media further offers effective platforms for building a positive destination image (Boes, K., Buhalis, D., & Inversini, A. (2016). Digital communication networks are driving changes that will rebuild cultural and personal ties, signaling a new society that Castells describes as the "Network Society" (Castells, 2016: 9). In this new society, the key is to be constantly connected to a network and to others.

Bonson, Royo and Ratkai (2014) stated that an effective social media strategy is only possible if it encourages participation. This participation has been examined in the context of place branding, but studies addressing the use of social media in the context of smart cities are relatively recent (Harrigan, Eversi, Miles & Daly, 2017). Smart cities invest considerable resources to optimizing the use of social media channels, research regarding the methods and aims of this optimization remains scarce. Therefore, the primary objective of this research is to analyze social media interactions between smart cities and their visitors and residents using content analysis techniques. Data were collected from the Instagram accounts of fourteen smart cities in Türkiye. 2025 data indicate that videos and photographs on Instagram, utilized by 58.5 million individuals in Türkiye, elicit greater engagement than those on Facebook, which possesses the largest user base (Statista.com). The decision to collect data for this research from Instagram was based on its interactive capacity, visual emphasis, and the opportunity to apply filters on photographs to enhance engagement. This research is significant as it is one of the first studies reviewing the existence of smart cities within the social network context and establishes a foundation for subsequent studies. The research sought to determine the smart cities' level of engagement in interactive social networking. The findings were analyzed for content, and the shared texts were visualized via word cloud to discern prominent topics and themes. The results corroborate earlier research indicating that perceptions or understanding of a city's attributes are more impactful

than emotions in fostering favorable representations of that place. However, despite their incorporation of smart city features, these cities were found to exhibit deficiencies in terms of engagement, as well as their image and brand. Smart city features were not highlighted in digital content, and engagement with visitors and residents remained at a minimum level.

2. City Brand Management and Engagement

The industrial revolution led to the emergence of new settlements, while globalization fueled the development of existing cities. The competition between these settlements for living and visiting purposes necessitated the discovery of distinctive and standout features. The concept of place branding has emerged to create a positive impression and positive approach to the city. It has gained a strategic function by encompassing the management of the city's physical identity elements as well as its virtual identity characteristics (Govers & Go, 2009). Countries, regions, and cities, along with their surroundings, have begun to implement strategic initiatives aimed at branding, aided by marketing techniques. The branding of towns, countries, and cities has then become a crucial aspect of urban and tourism planning, as studies indicate that individuals tend to associate memories to specific locations (Kavaratzis & Kalandides, 2015: 1369-1371). This association includes the significance assigned to a geographically defined place, such as a city, along with the perception it imparts. The concept of branding refers to the distinctive and valuable assets of a place, its characteristics that create a good image, and all the features that positively affect the city's reputation. These attributes facilitate the development of an emotional, personal, and functional identity, as well as the assimilation of this identity with culture to establish the city's positioning in the perceptions of the target audience (THatch & Schultz, 2002: 991).

The traditional approach to designing a city as a brand focuses on emphasizing the needs for establishing the brand's purpose, formulating brand values, and delineating the vision (Govers, 2015). These needs constitute the foundations of the branding process, incorporating both tangible and intangible aspects of a location/destination, including its unique attributes such as history, culture, natural features, oral cultural artifacts like legends, and events such as fairs, concerts, and festivals, along with both tangible and intangible traditions. Currently, adaption to technological innovations is also encompassed under these features. The value of cities as brands is compared, taking into account the presence of such elements and their distinction from competitors. The perception of cities by their target audiences underscores the significance of effectively managing the city branding. Brand assessment, brand infrastructure, stakeholder participation (management), brand leadership, brand architecture, brand identity, brand expression, word-of-mouth, brand communication, and brand experience are influential elements in the city branding process (Hanna and Rowley, 2015: 88-90). In city branding, brand equity contributes to the success of a place brand by encompassing various aspects of its performance for stakeholders (Florek and Kavaratzis, 2014). City branding can be achieved via geographical nomenclature, product-location collaboration, or effective place management (Kavaratzis & Ashworth, 2006: 190-191). Establishing a brand through a unique feature, element, or asset in a competitive landscape requires the city to be perceived as distinct, acknowledged, considered worthy of visitation, and particularly in the context of digitalization, the dissemination of the experience to followers via mass self-communication, as noted by Castells (2016), while building a community of a target audience interested in the city. Merrilees et al. (2012) highlight the potential of city branding to serve as a functional instrument that facilitates comprehension, engagement, and connection of various urban stakeholder groups, each possessing unique needs and expectations.

Hanna and Rowley (2015) emphasize the importance of urban brands' presence on digital platforms due to their qualified relationship with experience. The dynamics of urban research and discovery, urban decision-making processes, and engagements of both existing and potential stakeholders with the city are unfolding much more rapidly among urban stakeholder groups in the new, digital environment. Communication on digital platforms implies more than just a campaign; it requires speed, seamlessness, participation, and continuity. A city is deemed worthy for visiting and employment opportunities primarily through a robust branding strategy. Effective communication requires strategic management in both physical and digital/virtual contexts to create the desired impression.

Factors such as experience-oriented engagement, interactivity, and participation in online platforms, particularly social media, are critical to the effectiveness of communication strategies. The essential characteristics for the digital implementation of strategic city brand management include channels, noise, community, buzz, co-creation, and collaboration (Hanna & Rowley, 2015). These characteristics further determine the key components of digital urban presence. Digitalization facilitates the establishment of a participatory environment within urban contexts, thereby influencing urban transformation and planning. It ensures that cities function as platforms for discourse, hubs of attraction, educational spaces, and centers of cultural experience. Additionally, it safeguards individual and societal interests, promotes respect for cultural diversity, and encourages ongoing communication with the urban environment.

Utilizing digital tools to establish a digital identity and enhance visibility allows a city to provide users with access and participation, while simultaneously reinforcing its identity and reputation through the dissemination of urban experiences.

The city branding process elucidates the intended self-representation of a city and the perceptions held by its diverse stakeholders, including socio-economic groups, regarding the city and its governance (Peker, 2006: 21). In other words, building a city brand is often linked to associations and perceptions based on visual, verbal, and behavioral spatial expressions (Zenker, 2011). For instance, Paris is perceived as "the city of love," Milan as "the city of fashion," Tokyo as "city of modernism," Barcelona as "city of culture," Rio as "city of entertainment," Cannes as a "festival" city (Büyüksoy, 2008: 114), and Las Vegas as a "lively, complex, competent, contemporary, and friendly" city (Uşaklı &Baloğlu, 2011: 126). A study categorizing global brand cities as chaotic, orderly, or a combination of both (Büyüksoy, 2008: 115) identifies Rio, Shanghai, Cairo, and İstanbul as examples of chaotic cities, whereas Stockholm, Zurich, and The Hague are classified as orderly cities. Cities such as Rome and Paris are qualified in this study with characteristics of both chaos and order. Similarly, there are examples of associating a place with a cultural value: Gaudí's Barcelona or Zola's Paris. The association of cities with cultural icons is perceived as an effort to cultivate a creative identity within a location (Evans, 2003).

City branding practices may further be analyzed by categorizing into five distinct developmental periods. Throughout these developmental periods—primitive, empowering, entrepreneurial, formalized, and brand-focused—the pre-19th century is characterized by city governance and promotion being primarily controlled by governments and elites. By the late 20th century, the notion of competition among cities gained prominence, resulting in a phase where investors, employees, and tourists significantly impacted the city's image. The historical and natural beauties of a city, along with its cultural characteristics, tourism activities, shopping opportunities, fairs, ceremonies, festivals, sports events, religious centers, scientific studies, and international trade organizations, are critical factors that shape the building of a city brand and contribute to its overall image (Köker, Maden & Göztaş, 2013: 55)

City brands facilitate the identification and differentiation of a location as a tourism destination, generating favorable perceptions and promoting visitor commitment (Költringer & Dickinger, 2015). The use of digital tools facilitates the creation and dissemination of interactive content in urban communication with stakeholders, thereby enhancing engagement. Brand engagement is emerging as a key element of strategic brand management. Van Doorn et al. (2010) suggest that engagement can be considered as a manifestation of participatory consumer behavior toward specific brands. Customer engagement is defined therein as "the intensity of an individual's involvement and connection with an organization's offerings and/or corporate activities initiated by the customer or organization." Therefore, engagement may be interpreted as consumers' behavior toward a brand, or even actively participating in the co-development of that brand. Specifically, brand engagement via social media enhances user engagement through mechanisms such as comments, shares, and likes (Wang, Kim, Xiao, & Jung, 2017). Brand loyalty develops through four stages: behavioral, cognitive, emotional, and social. Strong and positive brand loyalty translates into higher market share and greater customer satisfaction (Pansari & Kumar, 2017: 300). In this context, this research aims to better understand the engagement of visitors and residents with the place branding of smart cities.

The continuous advancement of technology expands opportunities for individuals, which emerges as a topic of investigation regarding the potential reach of globalization (Ertürk & Tosun, 2009: 37). Cities, as living spaces where these processes manifest, interact with globalization, albeit at different levels. Cities that effectively make use of the data acquired through technology can address various challenges, including transportation, security, infrastructure, and energy sustainability. Thereby digitalization is transforming the physical characteristics, economic capacity, and sociocultural structures of cities. The digitalization of urban services and attributes, along with enhanced visibility of image and reputation, can facilitate differentiated dialogue with visitors, residents, and prospective visitors.

3. Engagement Through Social Networks

Digitalization has made possible the integration of email, websites, blogs, virtual reality technologies, artificial intelligence, Internet of Things technology, and social media into the communication practices of smart cities, targeting both domestic and international audiences through these new channels. The proliferation of social networks, characterized by their nature of facilitating participation and access, has transformed the engagement styles and direction of communication for all users, especially in recent years. This situation has brought with it alterations to both daily life practices and cultural norms. Particularly, the preference for places and venues that allow sharing on social media exemplifies the shift in sharing culture and the criteria for determining places to visit. Social networks profoundly influence marketing campaigns as well as the service delivery, meaning-making, and engagement processes among city residents, prospective visitors, and local governments. This new order ra-

ises the following question: What implications does the change in criteria that foster a culture of sharing and visiting have for smart cities? Clearly saying, the presence of smart cities on Social Network Services and their self-presentation to residents, visitors, and potential visitors is increasingly significant, as they aim to position themselves as attractive destinations for living or visiting. In this context, images/photos posted on social networks transcend personal or institutional memories; they provide a distinct visual narrative concerning concrete objects and contexts, enabling viewers to formulate abstract values that can only be conceptualized (Chlebus & Grudzien, 2018; Zingone, 2019). These images further serve as a tool for transferring social relationships and experiences from material cultural spaces to social network databases (Carah, 2014: 4). From this perspective, social networks function as a mechanism for generating excitement and anticipation regarding a city, while also acting as a communication medium that motivates visitors to explore that city. This reflects users' relationships with the city and influences their experiences.

Instagram, characterized by its emphasis on producing content for visual culture, serves as an interactive platform for smart cities to establish bi-directional engagement by promoting themselves to their target audiences, presenting themselves attractively, and managing perceptions of themselves. Besides promoting the city, it allows to identify the topics and themes highlighted by the city's target audience. Furthermore, it provides access to everyone interested in the city, from the city's local government staff to its members. It enables the establishment of a non-hierarchical dialogue.

City residents and visitors are key stakeholders of that city. Their engagement is crucial to the success of any city's branding strategy (Karavatzis & Ashworth, 2007: 18). This research defines engagement as the extent to which residents and visitors interact with a city's official social media platforms for facilitating communication with other users and local governments. The engagement process is often improved by user participation mechanisms such as likes, replies, comments, shares, tweets, re-tweets, and forms of user-generated content such as photos and videos. Conversely, Afzalan, Sanchez, and Evans-Cowley (2017: 21) illustrated that the use of diverse online tools by local governments to enhance stakeholder engagement has long been established in smart city initiatives. Social media channels are frequently used by cities to more effectively disseminate communication. In fact, the engagement with residents and visitors is yet an integral aspect of smart cities and smart destinations, though this concept is not exclusively confined to them (Boes, K., Buhalis, D., & Inversini, A. (2016). Furthermore, the growing appeal of city-centric social media platforms and the increasing trust users place in them promote further participation and enhance the visitor economies of destinations (Zenker, Braun & Petersen, 2017). However stakeholders' brand engagement via social media has been inadequately addressed in the literature concerning smart cities and smart tourism destinations (Harrigan, Eversi, Miles, & Daly, 2017).

Engagement of residents in local governance via social media offers reciprocal advantages for municipalities and is fundamental to branding strategies (Karavatzis & Ashworth, 2007: 18). Indeed, social media can be an important facilitating mechanism for residents acting as ambassadors of a place brand (Braun, Kavaratsiz & Zenker, 2013: 22-26).

Residents communicate with the city's digital face in the context of services, investments, and activities, while visitors can learn about the city's information and experience opportunities. Additionally, meaningful social media content from local governments is associated with higher levels of engagement between local strategic decision-makers and residents. Social networks, particularly Instagram for the purposes of this study, serve as effective platforms for producing content and establishing interaction for both residents and visitors. This content includes aesthetic visuals, city-related destinations, routes, perceptions of risks and opportunities, information about the city, comments, and personal experiences. In the context of smart cities, Instagram serves as a platform for data-driven, personalized communication campaigns. It functions as a tool for storytelling and experiential dialogue, enabling cities to interact directly with their target audiences.

4. Methodology

In this framework, the purpose of this study can be expressed in two dimensions: The first objective is to provide insight into how residents or visitors currently make use of Instagram posts. For this purpose, the official accounts of 14 cities identified as Türkiye's smart cities by 2024 were selected as a sample for this study. The utilization of social networks by smart city governments was analyzed. This study further examines the role and significance of engagement at the local government level, focusing on the use of social networks for digital communication with stakeholders in smart city accounts.

The use of social networks as a significant communication medium by both smart city managers, residents, and stakeholders necessitates drawing attention to the extent to which smart cities use these platforms interactively. In this research, the variables measuring visitor and resident participation represent the core of the model. On the other hand, the three broad concepts discussed are smart city, city branding, and social media. Additionally, the research is modeled based on a methodology originally developed by Molinillo et al. (2019) that was applied to measuring local stakeholder participation using

digital content analysis. They suggested that "likes", "shares" and "comments" are indicators of three specific dimensions of engagement in social media. Popularity, commitment, and virality levels were calculated using different methods.

Popularity (P) can be referred to as the attractiveness and notoriety of user messages. Popularity is calculated by dividing the total number of likes by the total number of posts and further dividing the result by the number of followers, and multiplying the result by 1,000. Commitment (C) reflects a deeper level of involvement with fellow users and the brand itself as it generates content on Instagram. Accordingly, Commitment (C) is calculated by dividing the total number of comments by the total number of posts, and further dividing the result by the number of followers, and multiplying by 1,000. Finally, the virality (V) of posts are calculated by combining the same dimensions into a formula. Accordingly, the virality (V) of posts reflects users' interest in the brand and its contents shared via social media. To determine virality (V), the total number of posts shared is divided by the total number of posts, then further divided by the number of followers, and then multiplied by 1,000.

In general, engagement is calculated as the sum of these three dimensions. Additionally, as part of this study, the overall tone, format (text, photos, videos, web links), and general themes of the messages were identified. One advantage of this method is that the data is collected from publicly available sources. It is based on the social media usage behavior of city administration. The methodology prioritized behavioral engagement, leaving sentiment in the background. The study was applied to Instagram, a social media platform, due to its suitability for promotion and advertising and its suitability for participation.

The data used in the study was collected from the official Instagram accounts of fourteen smart cities in Türkiye. As of September 2024, the research encompassed the following cities: Antalya, Bursa, Çanakkale, Çorum, Elazığ, Gaziantep, Istanbul, Izmir, Kayseri, Kocaeli, Konya, Malatya, Trabzon, and Şanlıurfa. These cities were recognized as the most successful smart cities in Türkiye, based on residents' evaluations of their effectiveness in addressing urban challenges (Smart Cities Portal Official Website, 2024). The selected cities vary in size. Ten of the sixteen smart cities are among Türkiye's metropolis. Eight of these metropolises have a population of two million, while the remaining two have populations exceeding five hundred thousand. All selected cities further rank among the most frequented destinations. İstanbul ranks as the most visited city, drawing approximately 13.9 million visitors each year, while Çorum, Elazığ, and Malatya, each receiving over 500,000 visitors annually, remain at the bottom of the list. Additionally, all of these cities have official Instagram accounts. – One of these is communicating with visitors, the other is communicating with residents. Some of the Instagram posts are related to services and activities for city residents. These posts cover topics such as courses, transportation, education, and sports activities. The content shared, especially that related to culture, aims to reach potential visitors, and content is produced primarily on topics that may attract the interest of local or foreign tourists. This research focuses on municipal Instagram accounts with the aim of identifying how they address city residents and visitors.

Table 1. Instagram Accounts of Smart Cities in Türkiye.

City	Number of Followers
Antalya	149,229
Bursa	127,887
Çanakkale	59,797
Çorum	22,297
Elazığ	26,085
Gaziantep	173,064
İstanbul	486,768
İzmir	396,319
Kayseri	39,676
Kocaeli	142,861
Konya	130,672
Malatya	36,165
Trabzon	40,130
Şanlıurfa	49,427

Table 1 summarizes the Instagram accounts analyzed for the purpose of this study. Data were collected manually by the authors between September 1-30, 2024. The first portion of the dataset, consisting of 250 posts, was coded by two independent researchers at different times as part of a pilot study. Inter-coder consistency analysis was then conducted, demonstrating a high level of agreement. This minimized subjectivity in coding and increased the reliability of the findings. The data collection process was completed by coding based on hashtags, keywords, types of shared content, and frequency. A total of 76,842 Instagram posts were analyzed within the scope of this research. The posts published by 14 smart cities were manually recorded and obtained. This process involved saving the posts to a computer and classifying them according to their similarities using Excel. Keywords were identified. It was determined that the majority of the data obtained was related to rational topics concerning urban facilities and services and the brand image of cities.

5. Results

5.1. Social Media Use

Table 2. Follower Rates Per 100 Residents and Visitors

	INSTAGRAM				
City	Resident	Visitors	Followers	Rate of Residents	Rate of Visitors
Antalya	2,619,832	9,300,000	149,229	5.70	1.60
Bursa	3,147,818	1,463,944	127,887	4.06	8.74
Çanakkale	542,157	2,500,000	59,797	11.03	2.39
Çorum	536,282	151,757	22,297	4.16	14.69
Elazığ	588,088	159,398	26,085	4.44	16.36
Gaziantep	2,130,432	765,000	173,064	8.12	22.62
İstanbul	15,840,900	13,900,000	486,768	3.07	3.50
İzmir	4,425,789	3,300,000	396,319	8.95	12.01
Kayseri	1,434,357	805,000	39,676	2.77	4.93
Kocaeli	2,033,441	1,824,000	142,861	7.03	7.83
Konya	2,277,017	1,846,519	130,672	5.74	7.08
Malatya	808,692	351,196	36,165	4.47	10.30
Trabzon	816,684	1,222,398	40,130	4.91	3.28
Şanlıurfa	2,143,020	1,059,850	49,427	2.31	4.66
Mean	**2,810,322**		**134,313**	**5.48**	**8.57**

Table 2 presents the number of all posts of the smart cities on the Instagram network dated between September 1 and 30, 2024, along with the number of followers, and population information. First, the ratio of residents to visitors on the social network platform was calculated for all smart cities by examining the relationship between the cities' residents and their total number of followers. Accordingly, it was concluded that each city has 5.48 followers per 100 residents. In other words, city residents do not actually follow the official account, which represents the local government as an institutional entity. This indicates stronger touristic engagement. When calculating the ratio of residents to visitors, the authors divided the number of followers by the number of residents, multiplied the result by 100, and applied the same formula to the number of visitors. Çanakkale, the smart city with the highest resident engagement rate, has 59,797 followers in return for a local population of 542,157, indicating that the official Instagram page is followed by 11 visitors for every resident.

The ratio of residents of smart cities to followers on Instagram in Table 2 represents the percentage of residents following the official Instagram page of the relevant smart city. Accordingly, Çanakkale (11.03%) is the strongest smart city in terms of the ratio of residents to visitors. This ratio is calculated by dividing the number of followers per 100 residents by the city's total population and multiplying the result by 100. It serves as data on the rate at which city residents find it worthwhile to follow their city's brand identity digitally and the extent to which they engage with it. According to this data, Şanlıurfa is concluded to be the weakest city, with a rate of 2.31%, indicating that the city's residents are less engaged and less interacted with its digital presence compared to its population.

According to the ratio of visitors to followers on Instagram, İstanbul has the highest number of followers. While İstanbul has the largest city size (population) and highest visitor rates, Gaziantep and Elazığ have the highest follower rates, with 23% and 16%, respectively, based on the number of visitors annually. While participation rate of Gaziantep and Elazığ's visitors on the cities' social media accounts is low, their engagement is quite high. Twenty-three out of every 100 visitors to Gaziantep and 16 out of every 100 visitors to Elazığ follow the city's Instagram account. This finding indicates that both cities' social media accounts are followed and viewed by visitors, and that the rating of posts is high. Based

on this, it can be interpreted that the gastronomy and cultural heritage assets of both cities strengthen digital participation and engagement. The lowest rate for residents was calculated for Şanlıurfa (2.31), while the lowest rate for visitors was found in Antalya (1.60). The study concluded that Antalya, despite its significant tourist influx, has not successfully evolved into a community engaged with digital content, resulting in weak digital engagement.

Figure 1. Instagram Hashtags Used by the Cities with the Highest User Response Rates

An analysis of posts dating back to September 1, 2024 indicated that the sampled cities averaged 1.5 posts per day on Instagram. The preferred format for these content were written text, accompanied by photos and web links. Events and heritage sites frequently dominate in these posts. The presence of posts in languages other than Turkish is uncommon; however, the incorporation of content from various websites and companies is standard practice. The written content of the smart cities' posts was compiled by the authors, and the resulting data were analyzed to identify prominent words and themes. Accordingly, words like "tourism," "park," and "museum" (mostly in Turkish), as well as hashtags related to celebrations, events, city names, and tourist attractions (e.g., #kepez #altinportakal), are among the most frequently used (Figure 1). The topics that generate the highest engagement are those that are more emotional or informal, such as #150gunde150proje or #barisinkenti [#hayatpaylastikcaguzel]. In terms of content, images accompanied by text and web links have dominated. Additionally, images uploaded to Instagram tend to convey more emotional messages. Hashtags used on Instagram tend to focus on place names and characteristics (e.g., #izmirfuari #altinportakal), intertwined with more emotional messages that emphasize the attractiveness of cities (e.g., #sevdamizkocaeli #corumicinaskla [#herseykayseriicin]).

5.2. User Engagement

Table 3. Popularity, Commitment and Engagement

Popularity (P), Commitment (C), Virality (V), and Engagement (E)

	INSTAGRAM				
City	**Followers**	**P index**	**C index**	**V index**	**E index**
Antalya	149,229	1.04	0.01	0.01	1.06
Bursa	127,887	5.88	0.17	0.04	6.09
Çanakkale	59,797	3.34	0.03	0.01	3.38
Çorum	22,297	3.05	0.27	0.08	3.40
Elazığ	26,085	6.44	0.15	0.04	6.63
Gaziantep	173,064	2.31	0.03	0.01	2.35
İstanbul	486,768	9.01	0.19	0.05	9.25

İzmir	396,319	2.23	0.11	0.03	2.37
Kayseri	39,676	5.37	0.15	0.04	5.56
Kocaeli	142,861	4.43	0.07	0.02	4.52
Konya	130,672	3.37	0.05	0.02	3.44
Malatya	36,165	3.12	0.02	0.01	3.15
Trabzon	40,130	11.91	0.30	0.14	12.35
Şanlıurfa	49,427	5.04	0.06	0.01	5.11
Mean	**134,313**	**4.75**	**0.12**	**0.036**	**4.90**

The results related to popularity, engagement, virality, and interaction on the Instagram application are shown in Table 3. Popularity levels based on the number of likes show significant differences between cities. There is no direct correlation between the number of social media followers and the number of "likes"; therefore, this difference can be attributed more to the content of the social media pages belonging to the cities. Therefore, it has been concluded that the number of followers on cities' Instagram accounts (whether high or low) is not an indicator of their popularity level. The virality of content shared on the Instagram social media accounts of the cities included in the study, based on sharing by other users, was the index with the lowest value among the calculated indices. No correlation has been observed between follower count and engagement index. In fact, this index has consistently yielded low values in both scenarios, regardless of social media follower count. Therefore, it is concluded that shared content influences users' engagement levels. The analysis on the engagement index indicated that smart cities with a high follower count exhibited the lowest levels of engagement, as exemplified by İzmir. This could potentially be attributed to a higher number of anonymous users who are using Instagram solely for seeking information without any engagement. However, there are also cities that achieve high levels of engagement through Instagram and have a higher number of followers (e.g., İstanbul). Other cities with very low follower counts, both absolutely and relatively, achieved high levels of engagement due to the activity of these few followers and very low levels of online anonymity (e.g. Trabzon). Furthermore, cities with high rates of post sharing achieved higher levels of user engagement, even though overall engagement was generally lower, due to the number of users. (e.g. Elazığ).

During the process of comparing index values, a post-hoc ANOVA analysis was performed in which each smart city was individually compared with other smart cities. The results show that Trabzon stands out significantly from the other thirteen cities in the sample in terms of popularity, while the other cities have fairly similar values. Despite being a smaller city, Trabzon was found to be the strongest smart city in terms of popularity, commitment, and virality. It was further concluded that its social networking strategy fostered engagement and participation. This finding demonstrates that these dimensions, rather than a high number of followers, drive real engagement. It was further concluded that destinations like Antalya, Gaziantep, and İzmir, which are perceived as more touristic cities and possess high brand value, struggle to establish engagement. It was argued that these cities have not yet reached their full potential in the digital environment.

6. Discussion and Conclusion

The opinions and perceptions of visitors and residents significantly influence how a city is perceived as a brand. This research highlights the role that both visitors and residents play in the city's brand perception and examines how visitors and residents interact with smart city brands through their social media posts. The results of an analysis on the Instagram posts of Türkiye's fourteen smart cities indicate that governing teams' use of social media remains quite primitive and has achieved limited success in encouraging participation and engagement among residents and visitors. Trabzon, a relatively smaller city, was found to have a strong engagement when evaluated according to popularity and engagement criteria, while touristic cities like İzmir and Antalya have a passive position with weak engagement. These findings fundamentally suggest that the sheer number of followers is not sufficient to understand and interpret a city's presence on social media. While Çanakkale stood out based on its residents, Gaziantep stood out with the visitors' engagement. Accordingly, it's understood that digital success is a key goal and that smart cities should produce more engagement-focused digital content. However, this determination is based on popularity, engagement, and virality data from the official Instagram accounts of 14 smart cities in Türkiye. Beyond social media, digital success has been identified as a key goal, as it contributes to the success of other countries' branding.

One of the important purposes of local governments' use of social media - especially for smart cities - is to ensure information sharing and circulation. Social media has been used as a tool for announcements related to the city rather than as a tool that contributes to and supports the image and brand development of smart cities by sharing information and content. Considering that brand image creation is related to emotional bonds, it is understood that cities are weak in sharing content that appeals to emotions while using social media rationally.

The results obtained with the help of data obtained through content analysis show that the perception of a city and its positive image are related to emotions. Considering the role of events such as conferences, fairs, exhibitions, and festivals held in cities in shaping the city's perception, it has been observed that limited effort has been made to disseminate social media content related to these events. Although the study did not use a scale directly measuring emotional response, content analysis revealed that posts containing emotional and informal expressions such as city affiliation or civic pride received higher engagement rates (Table 3 and Figure 1). This suggests that city perception and positive imagery are indirectly related to emotional content

It has been observed that interaction with smart city social media accounts primarily occurs through "likes," followed by users reposting the content. However, interaction through commenting on the content is quite limited. User participation is related to the type of content shared and the frequency of sharing by smart cities. For example, while residents tend to engage more rationally with their cities, visitors may be more inclined to engage emotionally with content published by smart cities by liking, commenting on, and reposting it more frequently.

Instagram, as a platform that addresses user inquiries and feedback, promotes user participation and facilitates the sharing of user-generated content, typically exhibits high engagement levels due to its encouragement of dialogue with users. However this study indicates that smart cities disseminate content exclusively via Instagram, lacking initiatives to promote user engagement. An important finding was that the majority of shared messages were directed at Turkish-speaking users. Very little digital content was found regarding English-shared content. This suggests that smart cities prioritize their residents in the digital environment.

Although Instagram is a marketing and public relations-focused platform, smart city account managers have been observed to produce content only for the internal stakeholder group of city residents. City residents significantly influence the visitor experience and place branding; however, it is evident that cities should select potential visitors as the primary target audience for their communication messages. Paradoxically, the importance of sharing information and content that could potentially increase engagement with local stakeholders is often overlooked. These include transportation opportunities, urban services/facilities, citizen recommendations, and so on. It is also noteworthy that, despite being designated as smart cities. These cities do not use the social network Instagram to promote their smart city features and the services they offer to their target audiences.

No correlation has been established between the number of visitors and followers of smart cities and their level of engagement. The diversity of content on social media in smart cities prevents the findings from being generalized. While small cities among smart cities can achieve high engagement, large cities can also achieve high engagement. The fact that cities of different sizes achieve similar engagement rates requires them to determine whether they aim to increase their number of followers or their number of engagements and to plan their strategies accordingly.

As a result, although many smart cities have achieved a certain number of followers and level of engagement through their official social media accounts, it is clear that they have not made sufficient use of their current capabilities. Stronger steps should be taken towards the goals of smart cities to create a destination image and strengthen the city brand. In this context, elements such as Wi-Fi access, integrated transportation networks, public services, and the provision and announcement of services for both the local population and visitors in the digital environment should be brought to the fore. The technological development of smart cities will enable them to stand out from their competitors. This finding, supported by the engagement and popularity data in Table 3, indicates that smart cities' social media usage remains limited and does not fully reflect their technological and digital capacities.

Smart cities' use of technology in a more participatory and interactive manner will contribute to improving their communication management. It has been understood that smart cities need to adopt an approach that establishes an emotional connection with both visitors and residents. Engaging with visitors via social media platforms before they arrive in the city, during their visit, and afterward is important for creating an appealing and visit-worthy city perception. In conclusion, it is recommended that smart cities and all cities adopt the methodology of this research and analyze their social media accounts in terms of content and interaction. Furthermore, it is suggested that future research include comparative analysis with smart cities from different countries, as this would contribute to the field.

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