

Analysis of Smart Tourism Issues Using Social Big Data Analysis

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Abstract

Smart tourism enhances communication between tourists and residents, improves quality of life, increases the utilization of local tourism resources, and helps manage cities efficiently. This paper analyzes recent issues and trends in smart tourism, derives key factors for activating smart tourism based on the analyzed data, and conducts research on promoting smart tourism. Using smart tourism as a keyword, data was collected through Textom. The collection scope included a total of 33,588 pieces of data related to smart tourism over the past year, from May 1, 2023, to May 1, 2024. The data was analyzed using text mining and social network analysis techniques. Through this analysis, the paper suggests directions for the development of smart tourism, enabling the activation of local tourism and effective urban management.

Keywords: Smart tourism, Big data, Text mining, Social network analysis

1. Introduction

In modern society, the advancement of smart technologies is breaking down the boundaries between industries, leading to new innovations. Particularly in the tourism industry, the adoption of smart technology has become an important tool for creating new tourism experiences and managing them effectively [1]. With the advent of the Digital First era, the tourism industry is experiencing a new wave of change. At the center of this change is smart tourism, which is being implemented in various forms such as smart hotels, smart restaurants, smart MICE, and smart tourism destinations [2]. Media programs like '1 Night 2 Days' and 'Youth Over Flowers' contribute to introducing Korean culture to tourists and increasing tourism demand. This demonstrates that the integration of the media and tourism industries is being used positively and proactively as a means of promoting tourism [3]. This paper aims to analyze the keyword 'smart tourism' by utilizing social big data. Through the analysis of 'smart tourism' data on social media, the study seeks to identify

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keyword frequencies, analyze patterns, and understand changes in interest, trends, and preferences over the collection period.

2. Related Work

2.1 Smart Tourism

Smart tourism reflects the characteristics of information technology and the technical aspects of smart tourism. It signifies that the development of ICT alongside smart tourism information technology can influence tourists' attitudes and intentions and predict future development directions. Smart tourism provides personalized information through real-time feedback and communication, catering to the needs of users [4]. By utilizing ICT technology, smart tourism aims to offer convenience to tourists and enhance their experience through rapid access to tourism information. In a smart tourism environment, tourists can receive a variety of information and access necessary services through smart devices without directly searching for or booking tourism information. Additionally, smart tourism can provide valuable information to solve issues such as traffic congestion and waste collection at tourist sites. To establish a smart tourism environment, it is essential to build the infrastructure of tourist locations, obtain support from local governments, and foster cooperation with the IT industry [5].

2.2 Big Data

As the digital age emerges, the industrial environment is continuously evolving. In this digital landscape, an enormous amount of data is being generated constantly. This data exists in various forms and sources, including smart devices, the internet, the Internet of Things, and social media. Big Data refers to the accumulation of vast amounts of information that cannot be processed with traditional database management tools. Initially, discussions on Big Data focused on its size and the technical aspects of storage, management, and analysis, but its meaning has expanded to encompass its value and potential applications [6]. Big Data is characterized by the collection, research, generation, and display of vast amounts of information in various types. Through these characteristics, the advancement of Big Data technology allows for more accurate predictions and efficient operations in a diversified modern world. Additionally, it enables the analysis, management, and provision of personalized information tailored to each individual in modern society, thereby realizing various technologies [7].

3. Research Methods

This paper collected data related to smart tourism using text mining and social network analysis [8]. The collection period was selected as one year, from May 1, 2023, to May 1, 2024. The main keyword, 'smart tourism,' was chosen and extracted from online documents on Naver, Daum, and Google for analysis. The analysis was conducted using the social matrix program TEXTOM and the Ucinet program. Through keyword analysis, the top 50 keywords were derived. Based on the extracted 50 keywords, network analysis and CONCOR analysis were visualized using the Ucinet program.

Table 1. Big data analysis information

Category	Details
Collection Channels	Naver, Daum, Google (Blogs, Web, News, Cafes, Q&A)
Collection Period	May 1, 2023, to May 1, 2024
Collection Tool	TEXTOM
Keyword	Smart Tourism
Analysis Tool	Ucinet Netdraw

4. Analysis Results

As a result of extracting keywords related to the smart tourism keyword, a total of 33,333 keywords were collected. After refining the keywords, the 30 words with the highest frequency are presented in Table 1. Among these 30 words, the ones with the highest frequency were Tourism (41,455), Business (10,998), City (10,795), Culture (10,117), and Traveling (6,672). Table 1 shows the word frequency for smart tourism.

Table 2. Analysis of the frequency of smart tourism

Keyword	Frequency	Keyword	Frequency	Keyword	Frequency
Tourism	41,455	Industry	5,378	propulsion	3,287
Business	10,998	Center	4,856	Seoul	3,269
City	10,795	Service	4,108	skill	3,150
Culture	10,117	operation	3,646	Tourist	3,108
Traveling	6,672	plan	3,420	Smartphone	3,096
an official announcement	6,648	Education	3,378	facility	2,994
Area	6,127	Development	3,337	Provision	2,973
Information	5,994	announcement	3,325	application	2,907
Support	5,981	Field	3,321	Participation	2,822
creation	5,454	Corporation	3,307	market	2,790

Degree centrality analysis is the most fundamental centrality indicator, and Figure 1 is the visualization result of the degree centrality analysis. In network analysis, the keywords positioned at the center are those that hold the most significant weight. The words appearing at the center included. The peripheral words included. The size of these nodes indicates a high search frequency[9].

Cluster 1, named 'Management and Operations,' was identified through the analysis of original data keywords such as management, announcements, and applications. This cluster includes initiatives like hosting a short-form video contest for a smart tourism city in Namwon and providing digital tourism marketing education related to smart tourism management and operations.

Cluster 2, named 'Activation Strategies,' was confirmed through original data indicating efforts by Taeangun to enhance local tourism through immersive content creation, such as hosting year-round events. This cluster focuses on temporal expansion of tourism and securing tourists through multifaceted regional efforts.

Cluster 3, named 'Smart Tourism Planning,' was identified through original data that highlighted local branding projects such as developing sports villages in pastoral areas and promoting marine sports tourism utilizing Jeju haenyeo (female divers) culture. This cluster is centered on planning and creating desirable tourist regions.

Cluster 4, named 'Smart Tourism Recognition,' was identified through data showing the use of electronic devices like smartphones or tablets and mobile apps, such as 'Visit Korea,' which offer various benefits to tourists and incorporate game elements like stamp tours based on user location information. This cluster demonstrates the use of digital and data-driven services in tourism.

5. Conclusion

This paper aims to understand the keywords and semantic structures related to smart tourism through big data semantic network analysis based on the core keyword 'smart tourism.' A total of 33,333 data points were collected from major portal sites from May 1, 2023, to May 1, 2024, and related keywords were extracted through text mining. The analysis focused on identifying the issues related to smart tourism over the past year by examining keywords. By analyzing trends in smart tourism, the study predicts tourism demand and congestion, establishes resource allocation and marketing strategies, and provides information on preferred tourist destinations and activities. The analysis revealed that smart tourism comprises four clusters: Management and Operations, Activation Strategies, Smart Tourism Planning, and Smart Tourism Recognition. This indicates that smart tourism not only promotes tourism in various regions by emphasizing digital smart tourism but also enhances the overall experience of tourists by leveraging technologies such as digital tools and data. The importance of integrating technology into tourism strategies to meet the changing demands of modern travelers was confirmed. However, the study is limited by the fact that data were collected from specific sites and periods, which means that more diverse data could not be included. Future research should analyze trends and cases of smart tourism through both domestic and international sites to provide more precise data analysis.

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