Urban Tourism Destination Image Perception Based on Social Network Analysis: The Example of the Tourist Sites in Yogyakarta

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Abstract. Urban Tourism Destination Image Perception aims to describe the image of urban tourism from the perspective of the perception of tourists, therefore, this study provides new information on the progress and innovation of urban tourism. The model proposed in this study can effectively depict a perceptual picture of a tourist destination, with the conclusion that the research provides a vital referential basis for the development of sustainable urban tourism. Combined with Social network analysis, we built a research framework of image perception of tourism destinations and then took popular online comments of beautiful places in Yogyakarta Travel as an example from twitter data using Drone Emprit. The results show that four aspects are included in tourists' perceptions of the image of the city of Yogyakarta: experience, historical culture, recreational services, and tourist destinations. Among them, the social network of the experiential dimension is the most closely related. In addition, emotional analysis illustrates that tourists' emotional tendencies tend to be positive under the four perceptual dimensions.

Keyword. Social Network Analysis, Twitter, Destination Image, Tourism, Drone Emprit

Article History. Received May, 2022. Revised June, 2022. Accepted June, 2022

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INTRODUCTION

The pattern of community interaction has changed after the internet was discovered, thus changing the social structure that was previously known as the "information society" (Petri, 2006). The condition in the information society that occurs is that people talk on the internet and trigger social movements (Navarria, 2019). Existing social movements are highly organized and involve informal social entities that are involved in existing conflicts for certain purposes, in this case the goals achieved are an important aspect to mobilize social movements in the information society (Porta & Diani, 2020).

Twitter is one of the social media platforms that provides real-time updates about the conditions that occur in the world, information obtained by the public is simply presented in the form of social interaction between users that results in public engagement (Papacharissi & de Fatima Oliveira, 2012). The data generated by Twitter is conceptualized as a big data generator, so that it can help researchers to understand facts and analyze conversation clusters, to see the relationship between related entities and the discussion problems involved in them (Larson et al., 2019).

The main challenge is that it is not easy to understand the interactions and potential social movements that occur on the Twitter platform. Because to understand these conversations, big data analysis is needed (Barbier et al., 2013). Big data analysis is changing the way social research is conducted, with no surveys, no margin of error and unlimited results, from any segment of society (Rob, K., 2014). Social Network Analysis (SNA) was developed as a new method for understanding thousands of tweets using hashtags related to COVID-19, using big data analysis to understand the conversations taking place on the Twitter platform. SNA analysis is very important to understand the direction of the digital social movement carried out by most people.

Recently, people have witnessed increasingly fierce competition in choosing destinations to travel during the COVID-19 pandemic by being offered various kinds of facilities that have advantages and very tight security. Therefore, the managers hope to win the competition and reach potential tourists and achieve sustainability in the tourism industry during the COVID-19 pandemic and more and more cities in Indonesia are trying to describe the image of a city that is better and safer for tourists to visit, therefore, making research on the image of tourism destinations as an important topic to be researched in the concept of tourism research. Destination image is a concept first revealed by John Hunt which refers to all aspects of cognition, evaluation, and impressions of tourists and potential tourists on tourist destinations.

After the 1970s, several researchers set their sights on the connotation of mechanisms, influencing factors, and factors forming tourism destinations, for example Gunn divided the image of a destination into two types, namely, the original form formed through social media and the induced form. and formed through commercial information. The image of a tourism destination influences tourist travel decisions to some extent, a distinctive tourism image plays an important role in building local tourism brands, attracting potential tourists, and developing the tourism industry in a more sustainable way.

Combined with social network analysis, this study builds a framework for the perception of tourism destination images by conducting social network analysis as well as emotional analysis and looking at practical cases of perceptual tourist destination imagery in Wuhan. First, the DroneEmprit software is used to collect tourist comments on popular sights in Yogyakarta which are published on twitter. Then, the main research framework is proposed. Through data pre-processing, the high-frequency words in the comment text tourists are counted; at the same time, the SNA theme model was created to identify the dimensions of tourist perception. Furthermore, social network analysis and emotional analysis were used to explore the correlation of feature words and sentiment of tourist orientation under each perception dimension. The research results can help pave new avenues for future sustainable development and tourism innovation in Yogyakarta and other cities.

Tourism Destination Image Perception

Research on Tourism Destination Image Perception has always been a hot spot in the tourism sector. Currently, the existing research methods on Tourism Destination Image Perception mostly focus on questionnaire surveys and web text retrieval. As a traditional research method, questionnaire surveys enjoy the following advantages: the results, obtained by questionnaires and interviews, are easy for quantification, statistics, and analysis. Martens et al. study the perception of the image of German tourists in two tourist destinations in Abu Dhabi and Dubai through field investigations (Martens et al., 2019). Cassia et al. collected a questionnaire from residents and tourists in the Italian city of Verona to compare the differences in perceptions of urban tourism imagery between local residents and tourists (Cassia et al., 2018). Kim et al. conducted an empirical study on the structural equation model of urban personality, urban image perception, and desire to revisit, based on data from 302 interviewees participating in an online survey (Kim et al., 2015). However, when applying this research method, it is difficult for the researcher to design a reasonable and comprehensive questionnaire, because the results are very likely to be biased due to subjective impact.

Another research method, web text retrieval, explores online comments made by tourists at relevant tourist destinations, which is gradually becoming the main method of data retrieval. In recent years, the rapid prevalence of online tourism platforms has prompted many tourists to comment and share notes online, providing a new source of information for tourism destination image research. Zaid Alrawadieh et al. studied the image of Istanbul tourism based on blogs published by western travel bloggers (Zaid et al., 2018). Hillary Clarke and Ahmed Hassanien used content analysis to evaluate the image of Toronto by digging deeper into the content generated by travelers on Twitter (Clarke et al., 2020). Gao Yin et al. analyzed tourists' perceptions of the Chongqing Park Expo Park from the aspect of seasonal influence, emotional scores, and attention factors using the comment data of the Chongqing Park Expo Park Network (Yin et al., 2021). Dong Shuang et al. take an online review of National Mining Parks as a sample and find that tourists' perceptions of parks are primarily reflected by their cognitions of the object's function (such as tourist attraction attractiveness, service quality, tourist destinations, etc.) (Shuang et al., 2010). However, there is one general problem, namely that these studies rarely emphasize the characteristics and differences of each perceptual dimension from a micro perspective. Even fewer studies on social network analysis take into account the dimensions of tourist perception.

Social Network Analysis

Social network analysis uses networks and graph theory to investigate social structure (Baggio et al., 2010; Otte and Rousseau 2002; Wasserman and Galaskiewicz 1994). Social networks form the structure of relational ties (or edges) between actors (or nodes), such as friendships between individuals or trade between countries (Albrecht 2013; Snijders 2011). Similarly, the form of tourism destination image perception is a relational network by connecting the sending system (supply area, origin, departure) to attractions in the receiving system (demand area, destination, arrival) which is realized in the tourist flow (Albrecht 2013; Sainaghi and Baggio 2017). .

The use of social network analysis to analyze tourism has grown rapidly over the past two decades (Baggio et al., 2010; Casanueva et al., 2016; Pulido-Fernández and Merinero-Rodríguez 2018). Importantly, the approach allows for an examination of both the tourism supply perspective (Pulido-Fernández and Merinero-Rodríguez 2018; Sainaghi and Baggio 2017) and the tourism demand perspective (Money 2000; Tyler and Dinan 2001). However, most of the tourism literature using social network analysis focuses on personal and organizational networks in tourism destinations (the supply side of tourism) (Casanueva, Gallego, and García-Sánchez 2016; van der Zee and Vanneste 2015). For example, tourism studies have used social network analysis to investigate the effects of collaboration among tourism stakeholders (Baggio 2011; PulidoFernández and Merinero-Rodríguez 2018), marketing (Bhat and Milne 2008; Wang and Xiang 2007), sustainable tourism (Albrecht 2013), and geography (Jin, Cheng, and Xu 2017; Lee et al. 2013) in tourism destinations.

METHOD

This study collects data from Twitter using the Twitter Crawling technique by the Drone Emprit Academy (DEA) engine (https://dea.uii.ac.id/) which was developed by Media Kernel Indonesia (UII, 2020). Drone Emprit is a big data system that serves to capture and monitor conversations on social media and online platforms. We analyze the frequency and trends of selected keywords related to Yogyakarta tourism. DEA provides various features including Twitter crawling, training and learning, analytics, reporting, demographic

analysis, etc. (Fahmi, 2017; Fahmi, 2020).

We collect Twitter conversations from January 01, 2022 WIB to April 30, 2022. The DEA system uses the Application Program Interface (API) service from the Twitter platform to collect conversations in real-time using the streaming method (song, 2020). Twitter developers provide Twitter Search API to get near real-time access to the most recent collection of tweets published in the last 7 days filtering through specific queries (fahmi, 2017; fahmi, 2020). We limit tweets to the keywords "wisata Yogyakarta" as the subject of our monitoring and assign them to the DEA search API to collect the requested tweets. The DEA Big Data Architecture Framework as shown in Figure 1. collects data from Twitter Streaming and Twitter Crawl and processes it into an index server based on the SOLR system.

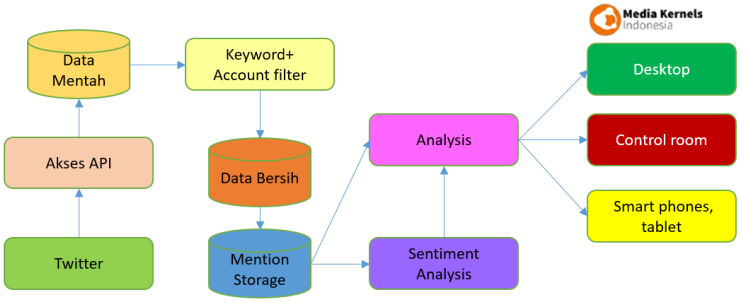

Figure 1. DEA Big Data Architecture Framework

All processed tweets (including mentions, retweets, and replies) are plotted using cumulative search volume to explore public perceptions of "online learning media". The DEA engine then identified public attention using word frequency and sentiment analysis (positive, negative, or neutral) and dominant tweets using emotion analysis based on Plutchik's Wheel of Emotions (joy, fear, anticipation, anger, disgust, sadness, surprise, and trust). DEA sentiment analysis was built using a machine learning approach through a supervised learning process and then analyzed using probabilistic classifiers (Fahmi, 2017; Fahmi, 2020).

RESULT AND DISCUSSION

The data was obtained after observing for four months from trending twitter topics and analyze the object of study, specifically Yogyakarta tourism. The data provided in this study is limited in a period of four months. The data presented in this study were 1,173 social media users Twitter which is active from January 01, 2022 to April 30, 2022 can be seen in figure 2. The data is processed by the system owned by Drone Emprit Academic (https://academic.droneemprit.id/#/search/index), and the author describes and analyzes descriptively (Suharsa et al., 2022).

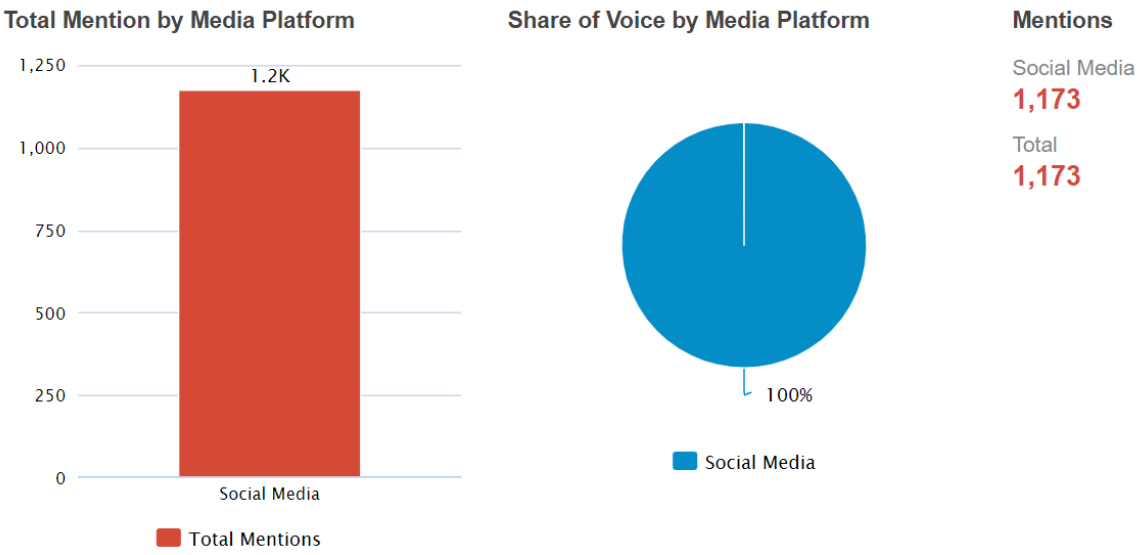

Figure 2. Distribution of twitter users

The development of conversations in social media (twitter, facebook, instagram) can provide benefits for researchers and policy makers regarding ongoing trends. To see the trend, a mapping/pattern of the data can be made using visualization techniques. Visually, users will find it easy to see the tendency of the data to be positively or negatively correlated as well as information on each of these categories so as to speed up and simplify the task of the organization to monitor and evaluate its performance. The visualization of data on social media is not only based on data similarity patterns, but also about regional sentiment patterns. The regional sentiments in question are user sentiments grouped by location where the social media is sent. This location illustrates regional sentiment towards certain issues. Figure 3 shows an increasing trend of conversations from January 1 to April 2022 as many as 1,173 tweets, and the peak occurred on March 30, 2022 as many as 226 tweets related to the theme of this research, namely Yogyakarta tourism.

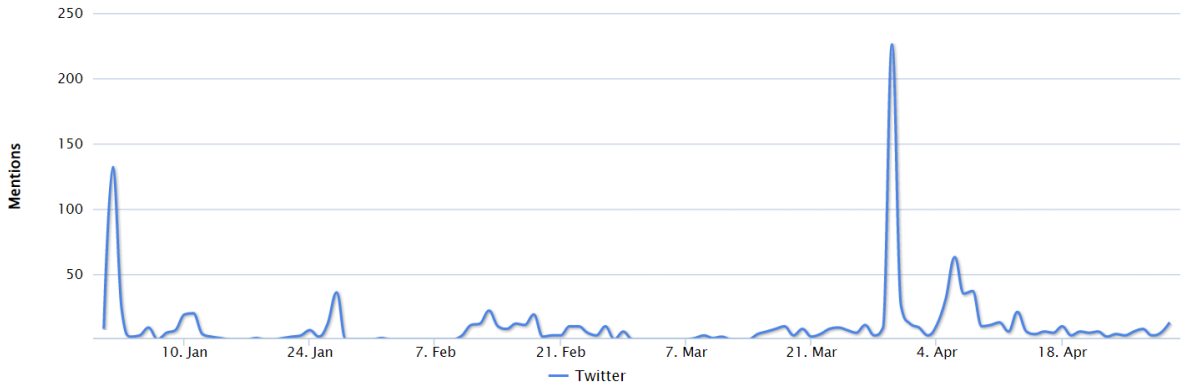

Figure 3. Distribution of the number of tweets

The researcher conducts text analysis, it can be seen from the analysis of the text generated from the drone emprit through the process of extracting keywords and manual categories.

Figure 4. Top Hashtags

The keyword extractor results can be obtained from the top 30 words that often appear in the Yogyakarta tourism network as shown in Figure 4. There are several main conversation hashtags, namely jogja, massagejogja, cheap massage, car rental, jogjaistimewa, newsjogja, etc.

According to Dewi Kumalasari et al., (2022) Twitter hashtags are short keywords that start with the '#' symbol. Hash tags serve as a means to coordinate, consolidate, and spread news/information to more netizens. If the hash tag becomes the talk among netizens, then it will have a bigger influence on other netizens on Twitter. This happens because of Twitter's ability to disseminate information through mentions, retweets, hyperlinks, hashtags, and other functions (Gunduz, 2020). Hashtag wars may occur as seen in Figure 5. Hashtag wars are at the forefront, the most obvious and most frequently appearing on Twitter related to netizens' conversations about Yogyakarta tourism. This data is in the form of an SNA map obtained through the droneemprit server. Netizen conversations are polarized into two large groups representing two political interests. Polarization was established based on differences in tourist destinations that netizens want to get when visiting the Yogyakarta area. As a result, when netizens were identified as opinion leaders in each group conveyed information related to Yogyakarta tourism. as a form of citizen journalism related to the wider public interest, they do not have the support of opposition groups. The political polarization of netizens on Twitter ignores the wider public interest.

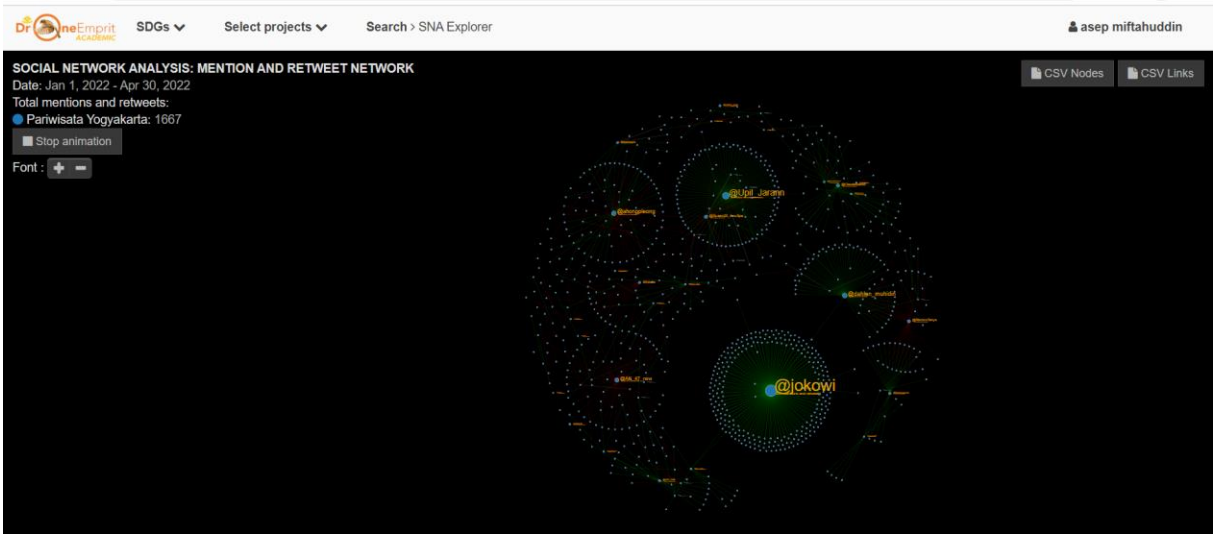

Figure 5. Social Network Analysis

The ability of social media platforms such as Twitter to measure public interest in response to tourism development in Yogyakarta can be a powerful tool for disseminating and disseminating information and policies related to tourism in Yogyakarta. However, if not used properly, social media can become a destructive platform for government efforts in

tourism development. Our findings on the changing trend of public perception expressed by Twitter users over a certain amount of time indicate that the government's response is inadequate to provide effective tourism communication so far. There is a need for more social communication and proactive media to address uncertainty and perceptions in society so as to build public trust and increase community engagement.

CONCLUSIONS

Our study shows how social media (eg Twitter) offers an opportunity for both the government and the community to analyze public attention to risk communication and tourism development steps in Yogyakarta during the "New Normal" period. Twitter can facilitate governments in conveying the right message behind difficult decision-making to the public while addressing public issues and encouraging them to adopt constructive behavior in tourism development. In this study, we found that most of the tweets expressed positive sentiment towards the issue of “Yogyakarta Tourism” related to the emotions of “trust”, “anticipation”, and “excitement”. Meanwhile, just few people expressed feelings of “fear”, “sadness”, “disgust”, and “anger”. Thus, we can conclude that the issue of "Yogyakarta Tourism" some received a majority positive perception of the Indonesian people.

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