Data Analytics in Smart Tourism Design: A review paper

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Abstract—The tourism industries today have adjusted to a rapidly shifting landscape and increased competition. "Smart tourism" is a word used to describe the present phase of tourist development that has been impacted by the advancement of information technologies and is emerging as a viable strategy for adjusting to the changing market conditions. In the age of digital revolution, big data has become increasingly important in influencing both new players in the tourism sector and how people travel throughout the world. With the use of big data, all of these businesses can forecast traveler demand, improve decision-making, manage information flows and customer interactions, and deliver top-most service more effectively and efficiently. These days, it's thought that design is essential to the success of tourist sites and enterprises. This conceptual paper synthesizes the past literature and gives an overview of how data analytics has been used in smart tourism.

Keywords—Big Data Analytics, Technology, Tourism, Smart Tourism

1. Introduction

In a 2008 piece for WIRED magazine, American author and businessman Chris Anderson boldly predicted that we were seeing "the end of the theory" because new information was emerging that would replace the theories of old science and render them out of date. While his material is quite provocative and clearly controversial, Anderson cut across our understanding of knowledge creation, research methodologies, and how to engage with the real world in the so-called Big Data era and therefore big data research aims to identify new design and operational challenge insights, which can be meaningful, and often in real time, supporting traditional methods of research such as testing, focus group research, and consumer analytics. Analysis of big data has a lot of potential in the travel and tourist industry. The term "smart tourism" describes the fusion of marketing ecosystems, technological innovations, and travel experiences. Researchers notably contend that the key technologies for smart tourism are mobile devices and sensors, which make destinations more technologically advanced. This allows destination marketers to predict travelers' needs in real time and improve their experiences, making it easier for travelers to share their travelogues. Highlight how the vast amount of visitor-provided social big data can support the development of a smart tourism destination's value chain. Therefore, it is argued that intelligent tourism development requires destinations and comparisons.[1-4]
2. Literature Review

2.1 What Is Tourism Big Data?

Information is essential to the tourism industry. By exploiting the huge new big data repositories of information, which hold significantly more information than what is collected in typical databases, researchers, managers, and politicians can make decisions based on data-driven evidence rather than anecdotes, conjecture, intuition, or experience. The abundance of big data in the tourist industry has the potential to provide fresh and more insightful insights into human behavior and activity, which will strengthen the sector and benefit both consumers and industry participants. In addition, Big Data takes into account the qualities of Volume, Value, Variety, Veracity, and Velocity to guarantee accurate information rapidly and to provide businesses, researchers, and consumers with advantages and ease.

2.2 Predicting tourist demand using big data

The term "big data," which is widely recognized and frequently employed to describe the exponential growth and ease of access to data in the contemporary era, is predicted to persist or possibly gain momentum in the near future. This general term refers to datasets that are so big or complicated that they cannot be processed in a timely manner using standard software tools and data processing applications.

2.3 Advantages of using big data in tourism

2.3.1 Travel History:

Estimating travel demands is a big advantage. Basically, tourism demand is all about tourist expenditures and arrivals. Big data can help you collect and do an analysis. Revenue Management: Big data facilitates the integration of analytics and the identification of features that are valuable to clients who are prepared to make a payment. Trend Prediction: Data sovereignty helps to predict trends, forecast arrivals, and measure the reputation of a destination. Marketing Strategy: Big data enables travel agencies to target the appropriate individuals at the right times with a more strategic approach to marketing.

2.3.2 Travel Demand Modeling with Behavioral Data

Travelers of today seek a customized and all-inclusive experience, and they attempt to support their choices on the proposal with their own motives declarations that are posted online. In addition, official and unofficial records are listed the websites communicate their own preferences, and opinions, to other travelers plan upcoming travel destinations, look over itineraries, evaluate, create plans, and pay from the comfort of your residence using a computer and a few clicks. Also, he is with them on mobile phones, unique information is created from visual images and text, and he feels when you’re at your destination. Only if companies and researchers can process more data—structured and unstructured—and they can know what customers want and, more importantly, expect businesses to decide to
optimize their businesses time and self (6). Of course, there is more to tourism unlike in other industries, the 3Vs of big data simply reflect what matter the complexity of managing such a large amount of information: in line with (7), “Big data means there’s a much bigger presence, somehow Gigantic, continuous and near real-time amount of data (volume) (velocity) from different (strengths) of data sources”. Keep in mind that this is one of the major advantages that Big Data Tourism offers. The business is shifting to "smart places," particularly "smart cities," which ensure sustainable development while offering experiences and connections between the traveler and the location. like the production and consumption of goods. They are simultaneous in visit, which means they are buying information on a larger scale. It was held at all stages as the visitors passed. Also, the attraction of big data is its ability to predict events, predict behavior.[5-8]

3. Research Design

We have embraced secondary data analysis by looking over earlier works in this field. Since the subject of big data in tourism has grown over the past ten years, we have only taken into consideration publications from the previous year. A summary of pertinent research on travel, data analytics, and big data in tourism is given in Table 1. It includes a range of investigations carried out by distinct authors, showcasing their main ideas and the topics they covered in their studies. By offering insights into the numerous concepts discussed in the literature, the data in the table aims to give readers and researchers a thorough picture of the current state of big data in tourist research.

3.1 Measuring Human Senses and the Touristic Experience

People have senses that include attitude, behavior, and memory, where "our bodily states, situated actions, and mental simulations are used to generate our cognitive activity" (8). The human body uses its senses as its primary means of gathering information, which serves as the basis for deriving meaning. In the context of tourism, people investigate a location, they see, hear, smell, touch and taste in combination with their own thought and prior experiences (9). Thus, the relationship between the place and meaning is mediated by the senses of the traveler (10). Since embodied experiences can also account for our emotional and cognitive reactions to locations (11), comprehending this process is essential to "creating meaningful touristic experience".

3.1.1 Senses and Tourism Research

Emotion or emotional experience in tourism has been studied in two ways marketing/business psychology and human-geography/anthropology methodology (12). (13) How to create the experiential quality of resources and where sensory experience is regarded as the product of environmental stimuli were two ways that the sales/business approach to understanding the function emotions and feelings in decision-making was promoted. The embodied sensation (or feeling) is said to mediate the connection between a traveler's surroundings, body, and cognition in the field of tourism, according to research conducted using the anthropological/human-geographical technique (14)

3.1.2 The Quantified Traveler and Smart Tourism Development
Envision a tourist visiting and investigating a location. Without having to look at a smartphone screen, Fred or Sara can navigate to a specific destination with ease thanks to smart shoes that have GPS built in. He or she simultaneously keeps an eye on their heart rate and body temperature to avoid overheating and other potentially harmful health effects. The room has been thoroughly cleaned and is ready for use when you return to the hotel. Fred's smart watch shows the perfect route for a morning exercise on a beautiful path near the hotel. An app on his smartphone senses his emotions while he's running and suggests tweaking today's itinerary to include fewer physically demanding activities, changing the watch's color and style, and even suggesting new music. Fred, who is still missing his family, just turns to a picture of them that is next to the TV.

3.1.3 The Rise of Wearable Technology and the Quantified Traveler

Quantitative participation is an emerging phenomenon with multiple representations self-monitoring, biographies, personal assessments, and the use of technical devices for personal information. The idea of the quantified person depends on the other a process in which people voluntarily examine their lives to better understand them (15). Actually, the concept of self-reflection and persistence has a very lengthy history that dates back to the 1970s (16). Since then, the idea of introspection has shown to be successful in modifying people's mindsets and actions, which is what visibility is all about. A Profession in Cognitive Technologies (17). The motivation behind this movement is to follow one’s life and gain knowledge “do good” behavior by quantification (17). For these purposes, the number of participants was calculated many benefits of this system have been identified including access to their information, life, look after and challenge themselves, and ultimately feed. The results of external comparisons of their social practices and goals, too possibly, other similar individuals. More significantly, the development of wearable technology—such as wristbands and smart watches—made feasible by accessible Internet, affordable sensors, and cloud computing has fundamentally altered the strategy. People need less effort and focus to get by in their daily lives (18). In many different domains (such as wellness, physical activity), the idea of the quantified self has gained popularity. It provides us with a wealth of personal data. To manually record their actions and feelings (e.g., walks taken, happiness, health, calorie intake, and number of cups of coffee), people may require a great deal of information and additional work. Though most of the technology that can measure and track people are unseen, (19). These are ‘wise’.

3.2 Geoanalytics of Tourists

Every year, around 8 billion people visit parks and protected lands (PPL) worldwide (21). The United Nations Environment Programme projects rapid growth in green tourism, environmental, traditions, cultural, and "soft adventure" tourism during the next 20 years. Global ecotourism spending is expected to rise faster than that of the tourism sector overall (22). As a result, it is crucial to manage PPLs for both visitor enjoyment and the preservation of natural resources. Managers must balance visitor experiences and impacts to achieve these sometimes-incompatible goals. A PPL is any natural area on land that is managed by the government and allows for recreational tourism. When guests may arrange a staying spot or entry within PPLs, their time in these natural regions is enhanced. Global PPL reservation systems collect transactional data for bookings at campgrounds and day-use amenities, as well as for the use of backcountry permits and trails.

4. Conclusions
Big data is not only an advantageous or adverse phenomenon, nor is it objectively neutral. Rather, it is a communal, technical, and moral phenomenon. Big data is becoming a popular instrument in business choices due to its ubiquity and explosive increase in use, but it also presents a variety of new social risks. In addition, there are worries about privacy and the possibility of big data being abused or misused as data technologies proliferate (26).

Modeling travel demand using behavioral Big Data: developments and potential analytical methodologies that ultimately aim to provide knowledge based on customers through information trails and visitor remarks. More and more information about demand populations is being gathered concerning the geospatial aspect of visitor experience (e.g., geotagged tweets, Facebook postings). A lot of geospatial data has been generated by the growing use of online reservation services; this data may contain a lot of historical usage information that could be useful for tourism destinations. The findings have numerous significant scholarly and applied ramifications. We showed how geotagged social media data may be used to track tourists' spatial movements over a wide geographic area. By combining data from several sources, local tourism authorities and destination marketing companies can give a more complete picture of visitor flow patterns by utilising the advantages of massive data sources with geotagging and references.[12-14]

References


