

ROLE OF BIG DATA ANALYTICS AND FIFA WORLD CUP 2022 ON THE QATAR'S TOURISM INDUSTRY: SYSTEMATIC REVIEW

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Abstract

Globally, events arrangement and management have become an inspiring component for the destination marketing. Tourism industry is intemperately thriving on information produced specifically through big data. Big data provides advanced and relevant inferences concerning behavior patterns, human activities and emotion analysis of tourists that will empower management and the tourism industry. This research work accomplished by executing a systematic literature review (SLR) to analyze the relevant research work reported recently in the targeted research domain. To perform this SLR work the relevant articles are accumulated from well-reputed online repositories including IEEE Xplore, ScienceDirect, Taylor & Francis, and SpringerLink. These articles were analyzed for their quality based on the research questions and their ability to answer them. This research mainly focusing on using the previous work as an evident to efficiently manage the crowd during the FIFA World Cup 2022 in the State of Qatar. This research work also aims to identify the guidelines and key steps that will laterally assist in boosting the hotel and touring industry in the State of Qatar. Findings of this systematic analysis will open new research directions for the research community to improve the tourism and marketing industry in a specific region.

Keywords: *Systematic Literature Review, Tourism, Big Data, Tourism Industry.*

1. INTRODUCTION

With the evolution of information systems and high speed internet, social media, and communication devices, a gigantic amount of structural and non-structural data is generated, recorded, stored, transmitted, and accumulated, forming the big data and opening a new age for the researchers [1]. In this modern technological and big data era, a variety of big data, encapsulated with the conceptual and technological innovations, have been suggested in diverse research domains including engineering, applied sciences, healthcare, management, business, tourism, etc. [2]. Inspiring from the numerous applications of big data analytics in diverse research domains, the researchers integrated big data analytics in for exploring many research problems like traffic flow management and object predictions [3], network security and pervasive computing [4-6], 5th generation and 6th

generation network security and reliable communication using deep learning and big data [7, 8], text recognition and identification [9-12], and many others. Many researchers proposed big data in healthcare domain like brain hemorrhage detection using artificial intelligence and machine learning [13], tourism and marketing industry [14], and many others. Resultantly, it is concluded that big data and big data technologies have paid significant contributions to improve scientific research, with tourism research as an emerging and typical example.

Tourism is to travel for pleasure or business. Event in its initial stage acts like a rich mine for generating tourism-relevant big that is primarily generated from three different key sources including customers, IoT-based smart devices and operations [1]. Firstly, the Internet has nurtured an exponential rise in social media, presenting a capacious tool to spread user-

generated content (UGC) data in the form of photos, texts, etc. [15]. Secondly, the exponential increase in the IoT-based smart devices during the last decade, diverse sensors-based devices have been deployed to track tourists movements and environmental conditions, providing a considerable spatial-temporal big data (such as global position system (GPS) data, Bluetooth data, mobile roaming data, etc.) [16]. Thirdly, tourism is a complex system embodies a sequence of operations (i.e., transactions, activities, or events in tourism market) such as web searching, webpage visiting, online booking & purchasing, etc., thus producing the corresponding transaction data of web search data, webpage visiting data, online booking data etc., for understanding tourist behavior and improving tourism marketing. Based on the big data from these three main sources, tourist behavior and tourism market can be better explored and understood by both academia and industries.

Sports is always considered as an inherent part of the South African culture. Since the country's return to the international fold in 1991, sports have also become an increasingly important part of the economy. The hosting of mega-events, such as the Olympic Games, is generally reserved for developed countries with an already advanced infrastructure. The FIFA World Cup tournament has, since its inception, been held in countries with a rich football tradition, and consequently, in countries with sufficient football infrastructure. However, inspired by a desire to advertise football and capitalize on its growing popularity elsewhere in the world, FIFA has begun dooming host countries outside of Europe and Latin America. This strategy by FIFA has led to the first-ever World Cup to be hosted on African soil. South Africa's successful bid to host the 2010 FIFA World Cup poses a unique opportunity to assess the impact of such a large-scale event on a developing economy [17].

The primary goal of this research work is to perform a comprehensive analysis of the literature to address the gaps in the extant and suggest new research directions to control a huge number of visitors during the FIFA World Cup 2022 in the State of Qatar. The relationship between big data and tourism is discussed in detail. This comprehensive analysis is performed by formulating a set of two research questions, selection of online repositories for the accumulation of relevant articles for the systematic analysis, and finally identifying a quality criterion to assess and analyze the relevant articles for grabbing the research-oriented information. Rest

of the paper is organized as follows. Section 2 explains the research protocol. Section 3 of this study work outlines the results and discussion section based on the finding accumulated in the previous step. Section 4 of the paper presents the conclusion and recommendations of this SLR work.

2. SYSTEMATIC RESEARCH PROTOCOL

Systematic research studies are performed to get in-depth analysis of a specific research domain and accumulate the information relevant to a certain topic of interest [18, 19]. This systematic analysis is performed after following the PRISM guidelines suggested for the systematic review processes [20]. SLR studies reported in diverse domains including PMIPv6 domain [10, 21], navigation assistant for blind and visually impaired personnel [22, 23], identifying the security and safety threats within a business environment to ensure high IT governance [24], effective contents adaptation and domain-wise learning preferences [25, 26], and many others. To the best of my knowledge there is no significant work reported in the proposed research domain. In order to address this problem, the proposed research systematically analyze the available literature to efficiently control and track the tourists during the FIFA World Cup 2022 in the State of Qatar. The experimental setup followed to accomplish this research work is depicted in Figure 1 below.

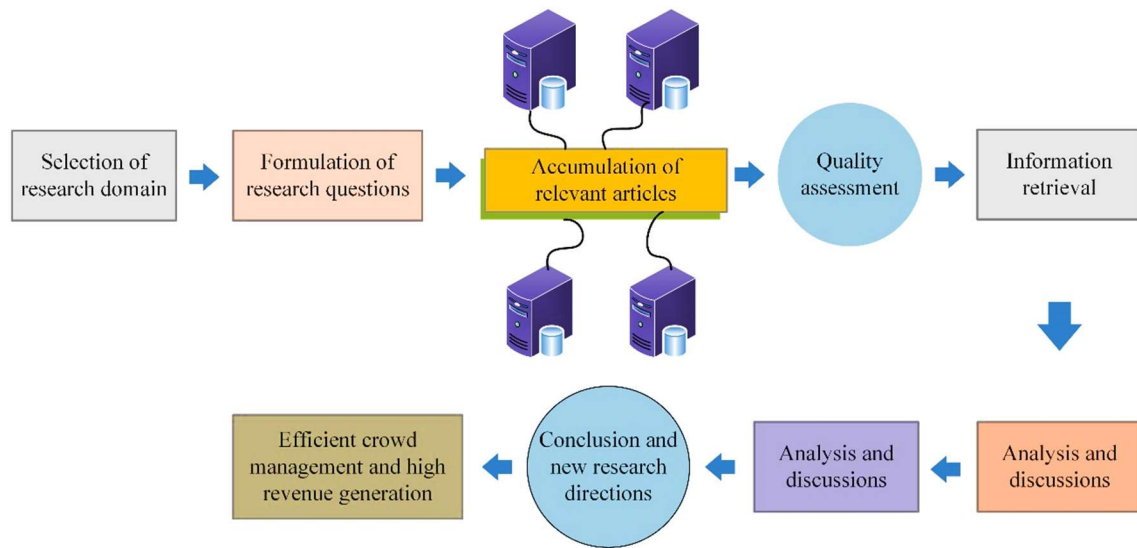


Figure 1: Research protocol followed to accomplish this systematic analysis

The research protocol depicted in Figure 1 contains four key steps (i) research questions formulation and data accumulation, (ii) quality assessment, (iii) useful information retrieval and conclusion, (iv) and finally based on the findings this systematic mapping suggests new future research directions. All these steps are explained in detail below.

2.1 Research Questions formulation and data accumulation

In this SLR work the first step is to identify a set of relevant research questions (RQs) to validate each

article for the final assessment process. A set of research questions formulated for this SLR work is depicted in Table 1. Then based on the RQs a database of most relevant research articles will be developed to perform the analysis process. These relevant articles will be accumulated from online repositories. In our case we selected Taylor & Francis, IEEE Xplore, SpringerLink, and ScienceDirect for the accumulation of relevant articles.

Table 1: Set of RQs

Research questions	Description
RQ1. Using the literature as evidence, how the FIFA World Cup 2022 can boost up the tourism and marketing industry in the State of Qatar?	This research question primarily aims to identify different aspects of the FIFA events (tourists' behavior, interests, safari, zoo, etc.) that can be used to boost the tourism and marketing industry in the State of Qatar.
RQ2. Using big data analytics, how the crowd can be efficiently managed during the FIFA 2020 event in the State of Qatar?	This research question mainly focusing on outlining the experience of researchers reported to handle a huge number of tourists during the FIFA events especially during the FIFA World Cup 2022 in the State of Qatar.

Figure 2 represents the articles accumulated from the selected online repositories based on the title, abstract, and contents presented in the relevant research studies. A total of 32 most relevant research articles are accumulated for the final assessment

process. The overall detail is depicted in Figure 2 below.

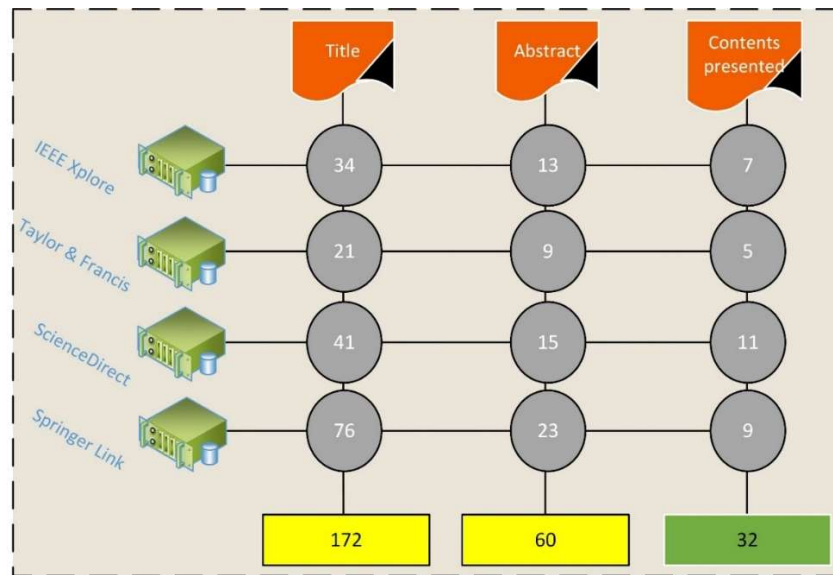


Figure 2: Database development process

Figure 3 represents the percentage contribution of each library in the development of the finalized relevant articles selected for the assessment and analysis purposes.

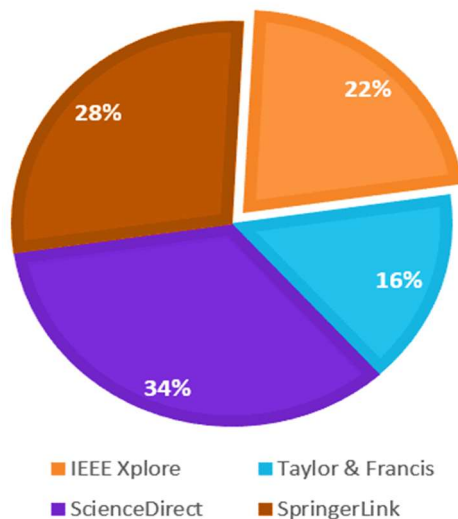


Figure 3: Percentage contribution of online repositories

From Figure 3, it is concluded that ScienceDirect contributed the more by presenting more relevant research articles to the selected research domain that

reflects the interest of the research community to present their research work in this online repository.

2.2 Quality assessment

After developing a final set of relevant articles, the next major activity is to perform the assessment process of the selected articles. A manual weighting assignment method is followed for the assessment and analysis purposes. Following are the assessment criteria defined for the evaluation purposes.

- If a certain research study satisfactorily answers the formulated RQs, then it is assigned a weighted value of 1.
- But if a paper partially satisfies an RQ(s), then it is assigned a weighted value of 0.5.
- Otherwise, it is assigned a weightage of 0. And it represents the non-relevancy of a certain article with that research particular question.

After performing the assessment process the underlined results are accumulated depicted in Figure 5. The high aggregate score represents the high relevancy of a certain article with the targeted research domain. The final set is evaluated based on type of paper and aggregate value based on weighted sum of RQ1 and RQ2.

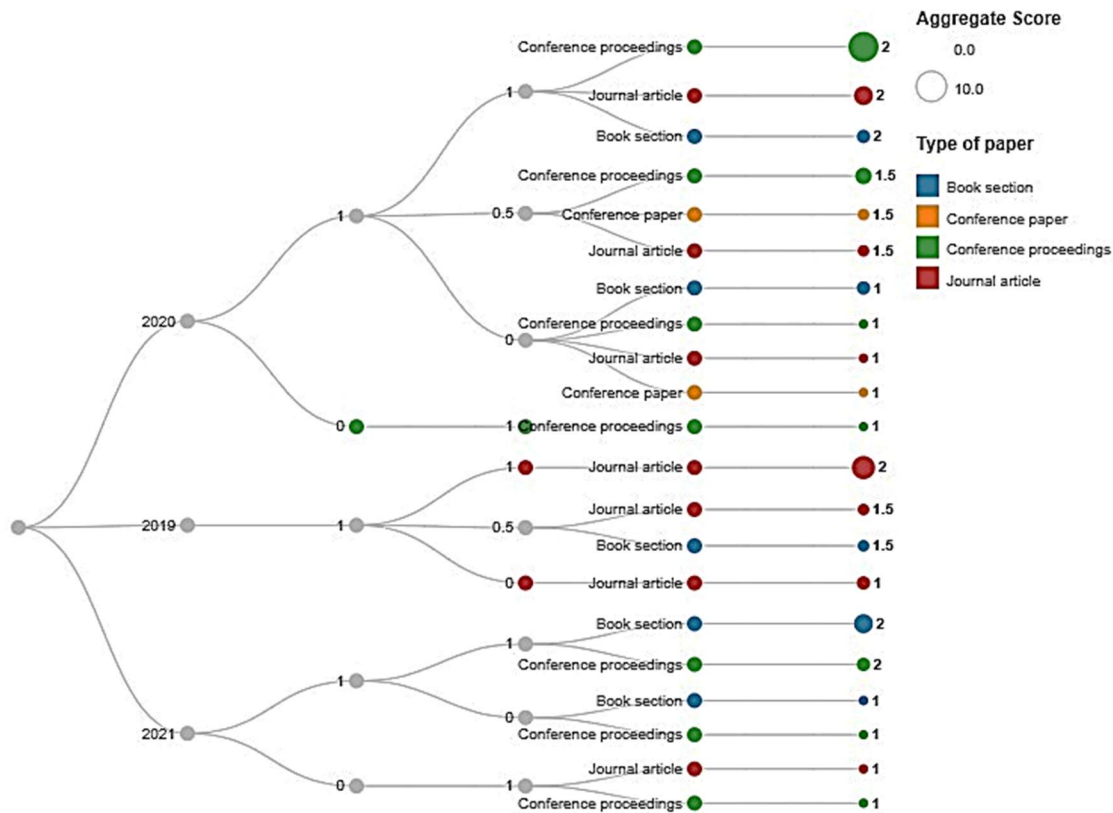


Figure 4. Quality assessment evaluation

In Figure 4, the highest aggregate score represents the most relevancy of a certain article with the selected research domain. After publication year the next circle represents the weighted value for RQ1, while the next circles (before type of paper) represent the weighted value of RQ2.

3. RESULTS AND DISCUSSIONS

Globally, the tourism has gained signification attention of different business companies and travel agents. And even its importance can be analyzed from the fact that nowadays the government organizations started initiative steps to promote tourism nationally on large scale. But tourism need a significant attention from both government and non-government organizations to handle any unwanted situation and provide the basic needs and requirements that the tourists require. This section of the paper has outlined the findings of this SLR work based on the formulated research questions.

3.1 RQ1. Using the literature as evidence, how the FIFA World Cup 2022 can boost up the tourism and marketing industry in the State of Qatar?

This finalized research articles are evaluated based on the RQ1 to identify how the FIFA World Cup 2022 can boost up the tourism industry in the State of Qatar to open new opportunities for business organizations to generate revenue. These new opportunities also open new gates for the workers to earn money and support their families in back. Some researchers like [27-37] focused on emotion-based analysis of tourists', to identify tourists' fine-grained emotions based on social media. This allows tourism companies to grasp what the customers are requiring and how their needs can be fulfilled to boost the tourism industry. While some researchers focused on efficient management of the events to attract more researchers [7, 38-43]. This efficient management can be in the sense to arrange different events at different places to divide the crowd based on their intentions.

Some researchers [44-48] suggested to develop an online tool where tourists can share their experience about previous tours and add their future planning, emotions, facilities, and type of events they expect. This intentions-based analysis will assist both government and non-government organization to make accurate decision in facilitating the tourists. The concept of enhancing smart rural tourism based on artificial intelligence systems by analyzing, designing, and implementing AI in rural tourism, in order to create a rural tourism brand by improving its competitiveness [49-53]. Some research articles discussed how sentiment analysis information can be used by the government to benefit, and understand which services to improve [12, 29, 36, 42-44, 53-59].

After assessing the literature, it was concluded that mega events like FIFA World Cup open new opportunities for tourism and marketing industries in the form of hotels, accommodations, Jeep rallies, desert safari, music events, swimming and beaches, shopping, etc. These new opportunities not only assist the industrialists or tourism and marketing policy makers to generate high revenue, but it also boosts the economy of a certain country. And such events are the major source of tourism and income. So, ultimately, we can say that the FIFA World Cup 2022 will boost the tourism and marketing industry in the State of Qatar.

3.2 RQ2. Using big data analytics, how the crowd can be efficiently managed during the FIFA 2020 event in the State of Qatar?

Qatar is hosting a prominent FIFA event in 2022 and expected a huge number of tourists from worldwide. Dealing with such a huge number of tourists is a hectic job. Efficient routing mechanism, transportation facilities, food facilities, refreshment facilities (local dishes, safari, swimming, etc.), shopping facilities, accommodations, and many others. The state agencies trying their best to identify some optimum mechanism to control and arrange this mega event accurately without occurrence of any unwanted situation. Based on the published research work the researchers suggested the use of big data and artificial intelligence to handle such a massive crowd [14, 43, 54, 60-67]. Inspired from the applications of artificial intelligence and big data in diverse fields like text recognition [68, 69], object detection and fault recognition [70], the researchers proposed machine learning-based model in the tourism domain to analyze the tourists behavior and sentiments [43, 58, 71]. Tourist behavior analysis and big data can provide tourism countries with

useful insights from social media websites such as Flickr or Panoramic. Such insights can enable the drawing of conclusions about tourist places which can help in understand tourist behavior patterns.

After thoroughly analyzing the extant, it was concluded that mega events like FIFA World Cup can not only attract a huge number of tourists from worldwide, but on the other side it challenges the state agencies in handling this massive number of tourists. Based on evidence accumulated from the literature it was concluded that different strategies can be handy in these type of situations like arrangement of different types of events to disperse the tourists (a small number of tourists then become easier to control). To provide easier transportation and routing mechanism so that the tourists can easily travel from one place to another. Both public and private transportation play their role for efficient management. Provision of an easy mechanism for the tourists to book hotel/room in the nearest position. Develop an easier interface in the form of mobile application to provide guidance to the tourists to travel easily. Ensure high security and safety of the tourists by hiring new personnel. Also, the state agencies also their role in ensuring the safety of the tourist. Immigration department must define an easier mechanism so, that the tourists face no issue in visas issuance or travel. After following these guidelines, the crowd can efficiently be managed in the World Cup 2022 arranged in the State of Qatar.

4. CONCLUSION

Tourism industry is intemperately thriving on information produced specifically through big data. Big data provides advanced and relevant inferences concerning behavior patterns, human activities and emotion analysis of tourists that will empower management and the tourism industry. This research work accomplished by executing a systematic literature review (SLR) to analyze the relevant research work reported recently in the targeted research domain. To perform this SLR work the relevant articles are accumulated from well-reputed online repositories. This research mainly focusing on using the previous work as an evident to efficiently manage the crowd during the FIFA World Cup 2022 in the State of Qatar. Based on the evidence reported in the literature, it was concluded that to efficiently manage the huge number of tourists expected in the FIFA World Cup 2022, it is mandatory to arrange different type of events at different places to divide the crowd (to control and manage them easily). Also, proper routing and transportation mechanism

must be defined to assist the tourists to travel towards their destinations easily. Immigration department play their role by providing an easier mechanism to get tourists visas. The state agencies must ensure high security and safety of the tourists by hiring extra personnel that will ultimately open new opportunities for the co-workers to support their families in back. Furthermore, this huge number of tourists open new opportunities for the tourism and marketing agencies to boost their business by providing hoteling, shopping, and accommodation facilities. Resultantly we can say that this mega event will change the fate of the newly established businesses and hotels. And ultimately it will boost the economy of the State of Qatar.

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