



Big data: A big boon for tourism sector

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Abstract

Tourism industry is very productive and promising industry in modern economy, not only from the view point of revenue generation rather also to nurture social and cultural relations. In tourism industry the customer data are very useful because they provide information about user choice, tour pattern, allied activities and hot tourist destinations etc. With the popularization of internet web based technologies, social media, smart phones and other hand-held computing devices the tourism data collection has become easier. Now a day a voluminous data is produced by various stake holders, which can't be handled with traditional data techniques. The Big Data techniques have very promising feature to deal with such massive data set. Big Data is capable to analyze this data from tourist industry and make a prediction for further growth of industry. Since Tourism and Big Data have been flourished as two immiscible academic disciplines and their cumulative strength is under harnessed. This paper has innovatively explored the weird potential of Big Data techniques and proposed a model for employ in tourism industry.

Keywords: bid data, tourism, big data in tourism, big data analytics, big data tourism model

1. Introduction

Tourism industry is the fastest growing economic sector world wide, accounting for about one third of the total global services market. According to a study conducted by Mont, India's tourism economy including its co-product travelling industry is poised to grow 7.5% in 2015 over last year, exceeding the 6.9% growth that the global forum has predicted for the South Asian region. In 2014, the industry contributed Rs7.64 trillion and 36.7 million jobs to the Indian economy. In 2015, the travel and tourism sector have contributed Rs8.22 trillion, nearly 7% of India's GDP and 37.4 million jobs-almost 9% of total employment [1].

The tourism industries have widely adopted internet and web technologies as a channel of communication with the targeted customers to enhance their operation efficiency, improve service quality and customer experiences [2, 3]. According to a study conducted by Hyde traveler behaviors tend to change when new technologies come. The traveler spend money for leisure, peace of mind and self-satisfaction, hence are more adoptable for new technologies than any one other. He may avoid vacation planning in the lack of flexibility of action and experiencing the unknown is essential amongst the hedonic experience they are seeking [4]. In the tourism sector, it is advantage to understand customers' needs to respond quickly to them with adequate offers irrespective of the online or the offline service mode. Innovation and Information Technology support an enhancing organizational performance by offering information to plan marketing strategies which are appropriate to consumers, pricing, and public relations [5]. The better development of these services may incur from prediction based on customer data amassed through their technology use trend. The business captures giant data from various processes under the business exploding and analyzing under Big Data. Big data is more than just size, rather it is capable to find pattern, trends, insights and make useful predictions [6].

The purpose of this paper is to explore possibilities of

applications of Big Data in Tourism industry, so that model can be developed for sector specific situations. Based upon it, the tourism firms will be able to define marketing strategies and provide more affordable products and services for tourists who have various lifestyles appropriately using data mining as a tool to accumulate information and learned behavior in real-time. The rest of this paper is organized as follows: section 2 presents review of relevant literature. Section 3 presents an over view of Big Data in reference to Tourism Industry. Section 4 presents the proposed model. Section 5 concludes the paper.

2. Literature Review

Consumer behavior refers to the problem of recognition, searching, selection, purchase and consumption of merchandises and services for the satisfaction of their needs. There are different processes involved in the consumer behavior. In the marketing study, marketers need to understand traveler behavior to determine why customers consume or do not consume a product. The tourism firm will succeed if they can identify customer needs and respond their demands [7]. The Smith model shows that globalization has changed tourist consumer behavior as it has the capacity to create impacts on [8].

1. Cultural criteria (culture, subculture, social class)
2. Social criteria (reference groups, family, roles and status)
3. Personal criteria (age and life cycle stage, occupation, economic circumstances, lifestyle, personality and self-concept)
4. Psychological criteria (motivation, perception, learning, beliefs and attitudes).

King and Hyde indicated that factors impacted by globalization dynamic, psychological factor of the tourists are considered to be the most important as it directly involves tourist consumer behavior [9]. Smith have explained classifications of persons who travel, which are proved to be very useful for tourism planning and marketing [10]. Buhalis

noted that the new generation travelers are more complex and highly demanding on quality of products. These travelers have known very well about attractions and tourism products. They had many experiences to spend time and money to travel. The new travelers like to compare details of products and choose the suitable items for themselves and they use the internet to search for information by themselves more than asking agency for services ^[11].

Innovation has become an important role in service sector ^[12]. The concept of Dorf and Byers indicated that businesses can create a competitive advantage. Organizations should pay more attention to innovation or the ability for innovation which innovation can play an important role in the tourism industry as well ^[13]. In general, tourism research is likely to use qualitative research rather than quantitative research because it can reflect the phenomena observed and explained various aspects more than quantitative which has less flexibility. However, the studies of innovation in tourism also run quantitative research in parallel. The mainstream of the research is to find the intensity of innovation compared to other industries or compared with other countries or internationality ^[14]. The role of Big Data and IT in Big Data Management was elaborated by Buhalis *et al* ^[15]. It presents a model of data analytics for Tourism Industry based on customer behavior pattern.

3. Big Data for Tourism Sector

3.1 Big Data

Big Data broadly refers to extremely large data sets now able to be acquired, stored and interpreted through modern technology. While no broadly agreed definition exists for big data, it is commonly understood to qualify datasets too large

to be contained or processed using the resources of a typical personal computer or the analytical capacity of commonly used spreadsheet applications. Big Data basically carries out two tasks: data storage and data analysis and characterized by three components viz. volume, velocity and variety; popularly known as 3V's. It is most innovative instrument to date for providing consumer behavior pattern and improving process efficiency.

Owing to the scientific decision making with great accuracy the Big Data is gaining popularity as decision making tool in business. Figure 1, depicts the popularity of data driven decision making process. Today's every activity is controlled by data. Every year we are producing new data, which is roughly equal to the data generated since dawn of civilization to 2003. The data storage is expanding exponential and we have entered in Zettabyte Data Age in 2010 as shown in Figure 2.

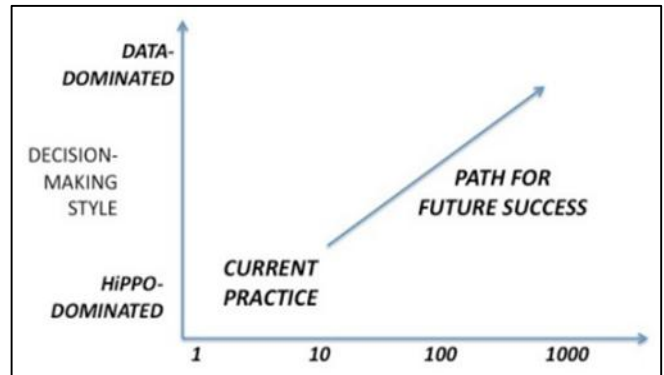


Fig 1: Popularity of Data Driven Decision Making

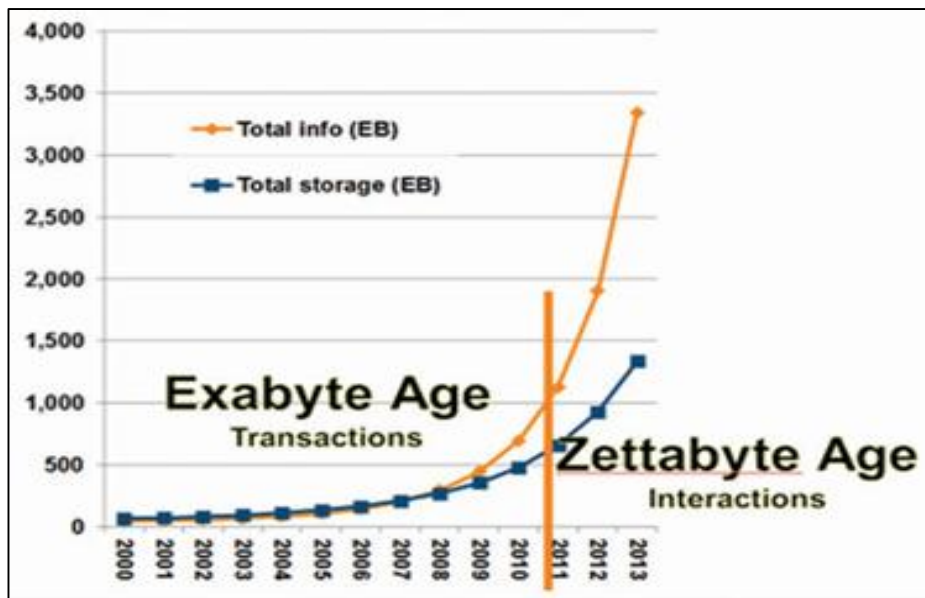


Fig 2: Data Age Break-through

Since the Zettabyte is too large data size to be handled with ordinary data management techniques. Different data size scale is depicted in Figure 3. Owing to advance analytical capacity and available data storage capacity, Big Data

researches have increased leap and bound in last few years. Figure 4, envisage the number of researches papers published on Big Data. This increased research shows the testimony for capacity of big data.

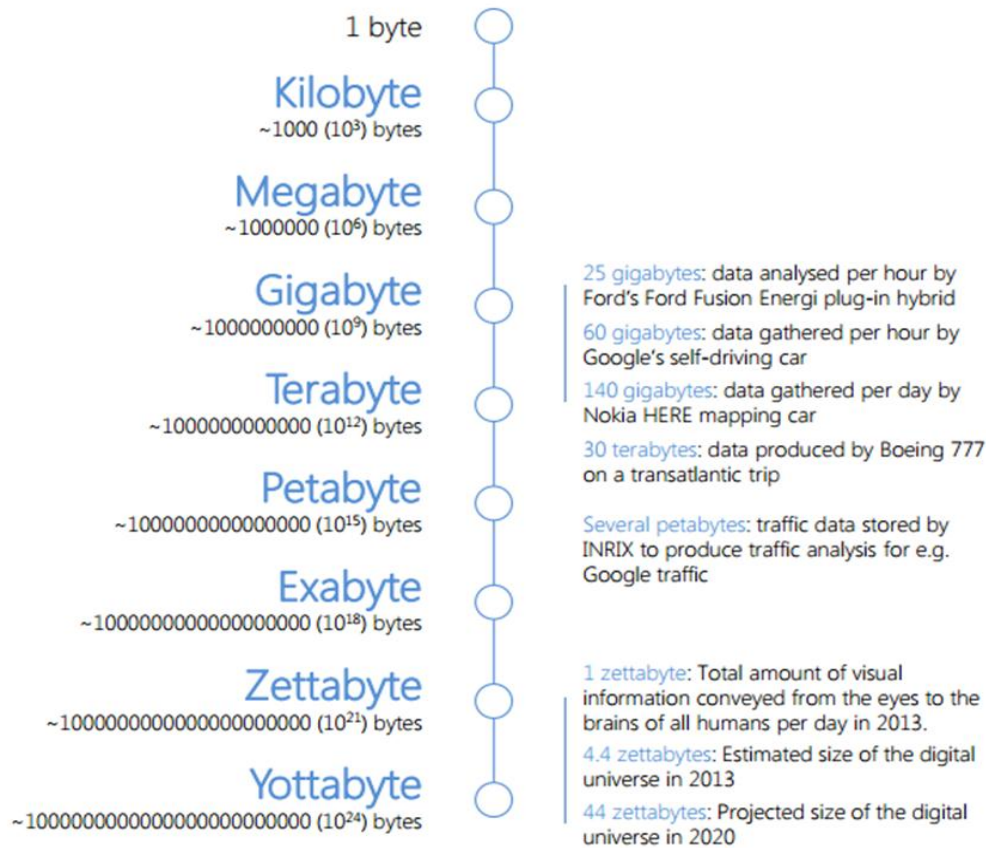


Fig 3: Data Scale (Source: Nokia HERE, Forbes, Idealab, GE, ITF calculations)

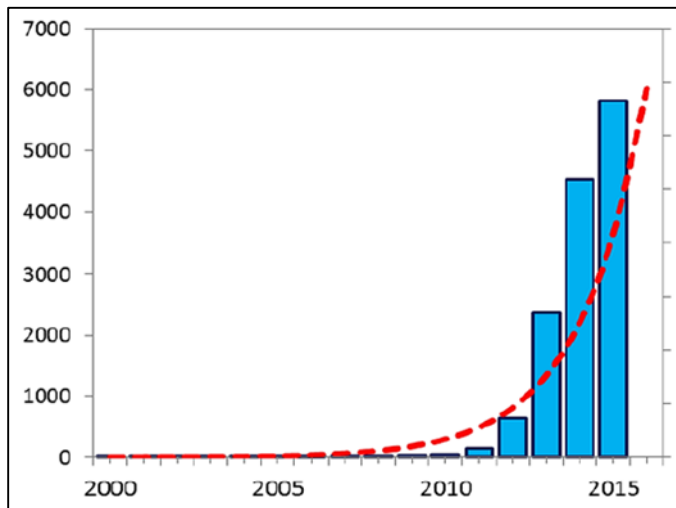


Fig 4: year-wise new research papers on big data

3.2 Big data Application for Tourism

There are several potential benefits, most of which also require business changes in addition to big data technologies. These benefits are consistent with those from previous information technologies, but the specific big data applications, of course, are different from the past. It has capacity to provide a tailored report useful both for business man and consumer. With Big Data, we can easily do:

- Negotiate with suppliers for better rates.
- Design and develop data bases for naïve and frequent users.

- Maximize revenue by well-planned and optimal use of resources.
- Well planned work flow and resources management can be carried out.
- Monitor the concept, process, end product for better service satisfaction.

The Tourist Industry is very vast where travelers are either from different locations or choose to visit different locations. This world-wide bulgance involves multiple players and hence makes the system more complex. In such complex scenario Big Data analytics can be useful for:

- Demand forecasting.
- Inventory management.
- Better decision support.
- Multi-channel complaining.
- Customer trust worthiness.
- Revenue out flow and cancellations.
- New products and services for customers

The above applications are handled by Big Data, which is otherwise not possible with other techniques. Rallying upon the above unique applications suitable to tourism industry, next section of this paper will develop a model using Big Data analytics and useful for tourist industry.

4. Big Data for Tourism Sector

The main issue in tourism sector for customer is satisfaction from services, while for service provider is to make reputation in fulfilling commitment while keeping the expenses at minimum. The basic Client Service Requirement Model for tourist industry is shown below in Figure 5.

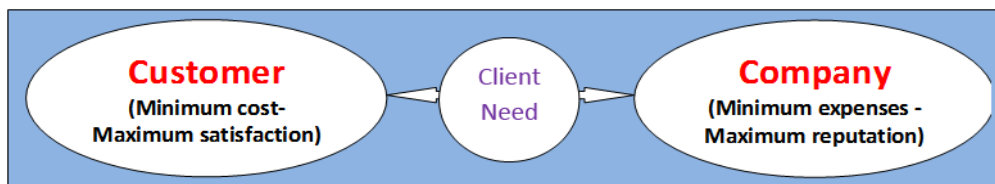


Fig 5: Client Service Requirements Model in Tourism Industry

In order to provide quality services to client the Tour and Hospitality provider company must target to customer needs, gain scientific back up support to understand the customer implement the strategies prepared for customer satisfaction as shown in Figure 6, below.

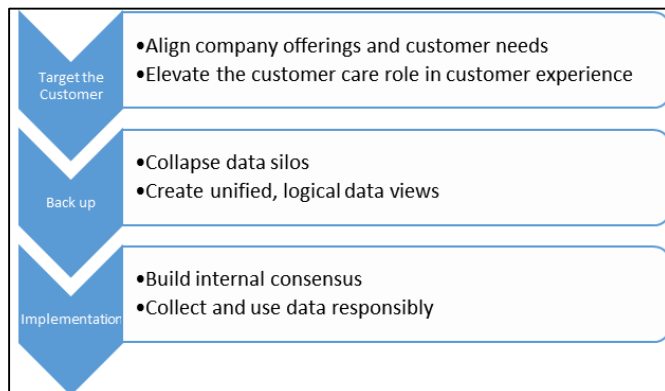


Fig 6: Steps to fulfill Client Requirements

Actually the Big based model differs from traditional client service model on the ground shown in Figure 7, below.

Table 7: Traditional versus Big data based Client Service Model

Traditional	Big Data
Manual collection of client use pattern, demand pattern, visit trends using survey, questionnaire, reporters etc.	On line collection of client use pattern, demand pattern, visit trends through electronic web access, and gadget usage etc.
Simple data analysis with limited possibilities to forecast	Advance data analysis with better forecasting and prediction
Small Data bases with limited information	Large databases with adequate information

In nutshell, the big data tool gather client information through his web search behaviors, social media interaction, locations tracking, drinking, eating, listening habits etc. which are directly related to his taste and choice. The statistics gather through this mode is real time and most trust worthy.

5. Conclusion

Big Data and data analytics are changing the theory and practice of tourism industry. Smart tourism and allied companies are using these technologies to anticipate customer needs, rewrite how they meet customer expectations, redefine customer engagement, and achieve new levels of customer satisfaction. In so doing, these firms are creating a new basis for the award of customer loyalty.

Big data and data analytics suggest that the future may belong to those firms best able to shape and deliver the consumer travel experience. In doing so, the experience of companies in offering such services will be an extra advantage. From this study it became clear that for hearing the voice of the

customer, shaping the customer experience, and moving from rewards to real and sustained loyalty in the tourism sector, Big Data is a necessity.

6. References

1. <http://www.livemint.com> (accessed on 16/09/2016).
2. Burke RR. Do You See What I See? The Future of Virtual Shopping. *Journal of the Academy of Marketing Science*. 1997, 352-360.
3. Peterson RA, Balasubramian S, Bronenberg BJ. Exploring the Implications of the Internet for Consumer Marketing. *Journal of the Academy of Marketing Science*. 1997, 329-346.
4. Hyde KF. Chapter10: A hedonic perspective on independent vacation planning, decision-making and behavior. Crouch, G. I.; Mazanec, J. A.; Oppermann, M.; Sakai, M. Y. *Consumer psychology of tourism, hospitality and leisure*. 2000, 177-191.
5. Anon. AMA Board Approves New Marketing Definition, *Marketing Educator*, Spring, 1985, 1.
6. Baggio R, Kalobas JE. *Quantative methods in tourism: A handbook of Bristol, UK, Channel view publications*, 2011.
7. Kotler P, Bowen J, Makens J. *Marketing for Hospitality and Tourism*, 2nd ed., Prentice Hall, USA, 1999.
8. Smith Valene. *Hosts and Guests: The Anthropology of Tourism*, University of Pennsylvania Press, Philadelphia, 1977.
9. King Brian, Hyde G. *Tourism Marketing in Australia*, Hospitality Press, Melbourne, 1989.
10. [10]Poon, A. *Tourism, Technology and Competitive Strategies*. New York: Cabi Publishing, 1993.
11. Buhalis D, Law R. *Progress in Information Technology and Tourism Management: 20 Years on and 10 Years after the Internet-The State of e-Tourism Research*. *Tourism Management*, 2008, 609-623.
12. Miles I. *Service Innovation: A Reconfiguration of Innovation Studies*. University of Manchester, 2001.
13. Dorf RC, Byers TH. *Technology Ventures: From Idea to Enterprise*. New York: McGraw-Hill Companies Inc, 2008.
14. Hall CM. *Innovation and Tourism Policy in Australia and New Zealand: Never the Twain Shall Meet?* *Journal of Policy Research in Tourism, Leisure and Events*, 2009, 2-18.
15. Buhalis D, Amaranggana A, Xiang Z, Tussyadiah I. *Smart tourism destinations in Information and communication technologies in tourism*, Springer, 2014, 553-564.