
Achieving Business Excellence through Big Data: Evidence from Tourism Sector

Eliza Sharma¹, John Ben Prince¹

*Symbiosis Institute of Business Management Bangalore, Symbiosis International (Deemed University),
Bengaluru, INDIA*

¹E-mail: eliza.phd1986@gmail.com

Abstract

The study aims to examine the role of business analytics in tourism sector. It provides an in-depth review of various applications of big data used by tourism companies, and challenges associated with the usage of big data by tourism companies. Using case studies of top tourism companies; namely; Make My Trip, Booking.com, Yatra.com, Thomas Cook and Trip Advisor; the implementation process of big data in tourism sector have been explained, along with its strategic importance for making companies' decisions. The study aims to highlight the dark side of using big data for tourism sector as well. Data was purely secondary, and qualitative in nature, hence qualitative analysis was conducted for the research. The major finding of the study is that big data has power to build the corporate image of the travel companies, through customer engagement, brand positioning, customized solutions and through market segmentation. Dark side of the big data usage, helps in framing strategies which can eliminate the inconvenience caused to tourism customers along with reaping maximum benefits from big data applications.

Keywords Big Data, Business Analytics, Business excellence, Business strategy, Tourism analytics, and technology.

1. INTRODUCTION

Data leveraged astutely has the power to improve the overall performance of the companies, Travel companies are no exceptions to this; in fact, travel companies are more likely to use data analytics as after e-tourism concept, most operations of the travel companies depend on the data analytics. Data analytics also helps the marketing department of tourism companies to get insights about the purchasing and travelling patterns of customers. It gives insights like customer's country of origin, the number of days he is willing to stay, which areas the customer is interested to visit or stay, how much the customer is willing to spend¹. According to this data, companies can come up with good offers which will be more customers centric. Suppose a customer searches for any tourist place on Makemytrip.com, all data searched for and entered will be analysed to come up with a series of suggested tours. According to this data, customized and affordable tour packages will be provided to the customer. The current trends that are ongoing in the tourism industries are – Mobility, sustainability, Lifestyle and experiential travelling, an increase in booking windows². Many international hotels, airlines, and railway are also using data analytics for dynamically managing prices and enhancing their revenue. This validates them to increase their revenue and develop the best travel experiences for customers. This data can be obtained from many sources like online feedbacks or word of mouth. This data

can be used to get SWOT (Strengths, Weakness, Opportunities, Threats) analysis of our competitors. This data can be more valuable, as it gives a clear picture of the gaps in the market. The study examines different applications/tools of big data in the tourism sector. These tools help companies to gain a competitive advantage over other companies if used effectively. The study also gives insights about the challenges faced by companies while implementing big data. It also explains the implementation process of business analytics and strategic decisions with the help of analytics. The flow charts used gives us a clear view of the process of implementation. Further, the study explains the dark side of using business analytics in the tourism industry. Keeping in view the importance of business analytics for the tourism sector, the current study is an in-depth exposition to examine how tourism companies can achieve excellence through business analytics.

2. APPLICATIONS/TOOLS OF BIG DATA IN TOURISM SECTOR

Spatio-temporal pattern technique: Big data is used to find the spatiotemporal pattern for the demand and supply in the tourism sector. Here, spatial pattern is the impact of tourism of one region on the demand of neighboring regions, while temporal pattern is the pattern created due to the seasonal effects over the demand factors. Making use of the big data related to the customers' preferences for a tourist's destination in a particular season can help in estimating the spatiotemporal pattern for the demand in tourism sector. User generated contents, visitation rates, hotspots data of tourists and the search engine queries can help in generating big data for this technique [1] [2].

Mobile network operator technique: Mobile network operator is a tool used for tourism analytics, where the analytics completely based in the big data generated by the mobile network operators, whenever a customer make use of mapping, hotspots or the search for a restaurant, or other places at some tourists' destination. Even the data related to the search for a particular place, from origin place, compared places can also be generated using MNO tool. This application makes the big data a competitive edge for designing tourist friendly policies and tourist plans for the potential tourists for a specific location [3].

Predictive analysis technique: This technique is one of the very important and widely used application of big data in almost all the sectors. Several companies are working on vector autoregressive models to estimate the demand of the tourism sector, using big data generated through web search queries and general database, and then using predictive analysis tools to estimate the demand. Several indicators which cause demand for tourism sectors, are taken together and then these are analyzed using the vector autoregressive models, to fit a trend line and knowing the cause and effects relationship between the vectors. Focusing on the causing factors, one can plan strategies for handling the excessive and less demand periods which are usually taken as the period for attention by the marketers [4] [5].

Text mining: Text mining is one of widely used tool of analytics, in travel sector, where the reviews, and feedbacks of the customers are available in the form of text and the text mining is used for analyzing the trends, similar patterns in the text data. It is one of the unique tools after evolution of the big data, as earlier the software available for the analysis did not have this feature and the qualitative data was tough to analyze. It was all affected by the subjectivity of the readers, or the analyst but now text mining application of the business analytics have made this easy and

more meaningful information to the decision makers. In travel companies it helps in taking strategic decisions based on the results of text mining tools [6].

Deep learning: Machine learning or deep learning helps in generating raw data by the system itself, which can be used for the analysis and several of the travel companies' strategies are planned using the deep learning technique. Pricing strategies, which adjust the prices as per the demands, and seasonal conditions, without comprising the profits of the suppliers, estimation of the demands, and the recommended products or services to the customers are some of the effective usage of the deep learning by travel companies. This can enhance the customer experience in both long run and short run which leads to word-of-mouth marketing and brand loyalty too [7].

Shrinking tools for big data: There are software such as Hadoop and EDB which compresses big data and extracts meaningful information out of it. Big data requires lot of storage; this has been managed easily by the companies. They use applications which handles big data efficiently without losing the essence of the information. Data per click saved efficiently on the backend yields itself to any kind of analysis required to assist in economic benefits for the firm. In travel sector, this tool plays specific important because it is a two-way information flow, which provides the information from buyer to suppliers and supplier to buyer, and every search history of both buyer and supplier results into big data inventory and requires some tool to manage such data [8]

Word frequency analysis: Under this method, the frequently used words in the blogs, websites, customers' forum are converted into different themes and the critical incident method is applied over different themes to analyze the behavior of the customers who have availed the services of the travel companies, or have stayed at some property. Based on the results, the different attributes are identified to work upon for improving the customer satisfaction and their overall experience [9].

Virtual reality technology: In tourism sector, augmented and virtual reality tool is used to provide memorable experiences to the tourists. Here, big data serves as a base, which is used to create a virtual environment of the desired tourist location by the customers. Customers before visiting a tourist's place, can decide in advance whether that place is worthy to visit or not based on the virtual reality technology. Both the video and audio stimuli are used to make the Customers feel in completely different environment, where they can have a feel of real environment. This technology actually immerses the customers, and helps in the promotion of the tourist's destination using big data. This technology helps in saving time and cost of the tourists [10] [11].

Web analytics: Web analytics as the name suggest is a tool used to analyze the contents of a website, which provides a deep insight about the business performance to the travel companies. The web analytics of makemytrip.com, or yatra.com, provides a clear picture about the number of customers visited their websites, products searched for, filtering process used by the customers gives insights about the customer preferences for specific products or offers, and type of promotional offers checked by the customers. Apart from all this, web analytics gives the information about real business generated by the customers such as; number of bookings, payment made by customers, mode of payment, actual travel history through a particular travel company, and cancelled deals or booking against cancellation etc. [12].

Performance Dash boards: Performance dashboard is a tool which is used by the travel

companies for both the buyer and supplier. Buyer is provided with the latest search options, similar products, products with discounted offers and facilities etc., while the dashboard for the sellers provide them an insight about the number of page search, rate of properties booked, and cancelled, comparison stats of customers, and the future predictions about the demand for their specific properties [13].

3. CHALLENGES IN IMPLEMENTATION OF BIG DATA IN TOURISM SECTOR

Cost factor: Business analytics companies use very good amount of software's, also there hire a lot of data scientist and business analytics to run these operations and also monitor the changes required accordingly. Hence, many new companies and those who have low expenditure cost or are new in this business, find it very difficult challenging to compete with existing players. Tourism sector uses a lot of Business Analytics, Apps such as Airbnb, Oyo is entire based on technology and uses business analytics, data science and is entirely software based. Lot of new firms with great idea finds difficult to implement at initial stage as the cost is very high and it requires lots of ads/publicity/offers to make it a success.

Real time data: Business analytics work on the principle of real time data, the older the data less effective it will be for any kind of analysis. Hence, company require the real time data to be processed, which not only requires the huge resources to be deployed by the company to access such data but also make it difficult. While for travel companies it is important to have the real time data, to predict the demand for the tourism services and products accurately.

Authenticity of data: "At the point when great data goes in the model, a great model delivers great outcomes." The inverse is known as GIGO (Garbage In, Garbage Out). In the period of Big Data, "it is altogether increasingly hard for the information examiner to mine in the mountains of data and locate the applicable pieces." All the time, legitimate models produce poor outcomes, which lead to inappropriate choices. In the era of Big Data, this happens all the time. An on-going story 20 reports how ten volunteers checked the exactness of their data on AboutTheData.com and they each discovered mistakes. In one explicit case, a volunteer found that "she had two youngsters, at 26." Interestingly, a CNN group found that Acxiom, the organization that runs the database, was increasingly precise determining the interests and less exact in segment information (marriage status, number of kids). Wrong suppositions can prompt wrong choices [14].

Structure of data: Structure of the data is another important hurdle while applying business analytics in an organization. Technological era has made the data availability easy and in abandon but the problem is the data is not found to be structured except for the database management system. Hence, it makes the adoption of the business analytics again challenging as data available need to be screened, sorted and filtered out as per the needs of the business. Most of the data is available in the form of semi-structured like emails, blogs and unstructured data such as; reviews or feedbacks.

Business analytics culture: Business associations are definitely entering the new worldview of Big Data. They have been making use of preferred databases for over three decades and have gathered understanding and information. Having said that, Big Data calls for the adoption of newer ways of thinking and practices; an enormous quantity of them are nonetheless in the

formative stages. Securing the new devices requires an excessive trade in hidden convictions or hypothesis—they require any other perspective. It requires, for instance, that a better variety of folks think ‘probabilistically’ as an alternative of ‘narratively’. It moreover necessitates that administrators determine how to pay attention to various overt signals and symptoms and do not turn out to be lost in the commotion [15].

Resistance by employees: The purpose of using “analytics is to bring business esteem through better vital and operational choices, at the vital level, the individuals who settle on choices about what models to execute and what should be estimated will collect more power. At the operational level, the usage of such models brings a force move in the dynamic procedure.” Data based changes and its training and implantation of new software’s and latest techniques can lead to a strong resistance by the employees [16] [17].

Management attitude: Adoption of business analytics in a company, affected by the management attitude towards it. Managers who believe in taking rational decision usually, believe in taking decisions or framing strategies which are backed by the analysis, proper data collection and facts and supportive statistics behind it. This kind of decision not only make the strategies and planning process effective but helpful in resolving the traditional issues faced by the companies. Management of Travel companies should understand the significance of the business analytics for the company’s growth and future prospects and should support analytics for each and every decision of the firm [18].

Cost benefit trade off: Cost benefits trade off shows the cost involved in adoption of the business analytics and the benefits derived using analytical tools. The cost is not only related to the installation cost or the cost of the intellects hired for this purpose, but it also involves the cost to upgrade the software as per the changing need of the macro environment, which makes it questionable whether the company will be able to reap the enough benefits out of business analytics or it is the cost that will eat up its benefits derived using the analytics. Updation and maintenance are the important steps of the implementation process and that requires huge resources. Hence, it is difficult to decide regarding the cost benefit in context of business analytics by the companies, especially in case of travel companies where the margin of the profits is too less [19].

4. AREAS FOR USING BUSINESS ANALYTICS

Customer engagement: Business analytics is one of the important strategic tools which can be used to improve the customer engagement. Customers get engaged when company keep a track about the likes, dislikes, preferences and the changing attitude of them with the advancement in technology. In tourism sector, travel companies keep a watch on the travel history of the clients, travel stories shared by the travelers, their feedbacks after visiting or staying at a particular place, and then based on this information keep on emailing about the similar options which can be preferred by the customers, or opted for in near future. Gamification engages customers via some game points, or sharing some GIFs or getting likes by others for a theme and getting travel offers in return etc. this all helps the company in generation of data, reaching to vast markets and engaging the customers [20].

Customized solution: Travel companies can make use of the business analytics for providing customized solution and enhancing their market share along with profits by increasing the

customer satisfaction. Customized solutions to the customers based on their related data, such as; tourism products or offers as per the salary range of the individuals, past travel history, promotional deals on specific occasions such as birthdays, or anniversaries. All the customized solution provided by the company are based on some kind of analysis, such as; details of birthdays and anniversaries related details of the customers can be taken while providing services to the customers and taking feedbacks which can help in providing customized solution later on [21].

Brand positioning: Brand positioning and business analytics go hand in hand especially in the technological era, where everything works on digital resources, decision making, consumer behavior gets influenced by the data freely available to customers. Makemytrip.com make use of the business analytics to position its brands, after analyzing the customers behavior and choices. Based on the loyalty of customers towards their brand, which is again measured using the analytical tools on big data available to them related to their loyal customers, company frame its strategies for the brand positioning and keep its customers updated about the brands activities and future plans.

Corporate image: Corporate image is the outcome of all the above-mentioned activities, such as; brand positioning, customer engagement and the customized solution. Travel companies like booking.com mainly focus on engaging their customers by accessing their data, and using analytical tools on such data, provide them customized solution, which helps in improving the corporate image of the companies. Hence, corporate image can be improved using big data and analytical decisions of the company.

5. BUSINESS ANALYTICS AND STRATEGY FORMULATION

Data used by the travel company is mainly semi-structured data, where the search history of the people related to the tour plan inquires, inquires related to the hotels booking, cab booking or the flight booking can be used, even from the mobile network operator's data the data related to the hotspot, google maps used and other information can be accessed. These need to fit into the strategic decision-making approaches for the company as well. At last stage of the implementation, tools applied and information generated for the problem, maintained and updated on regular basis by the company. Even the regularity in add up of information is required to reap the benefits of the analytics. For this, the authentic and large amount of data is the necessity for ensuring the success of implementation process.

Business analytics should be a part of the strategic decision of a company, which makes the decisions more successful and impactful as well. In the technological era, everything is based on the analysis. Hence, the whole process of the travel companies backed by the data and its analysis, without this travel companies can't work. Even a brick-and-mortar kind of travel agency also work on same basis, but the mode of data it makes use of is different. Such as; the receipts of the customers along with their names, contact numbers who have taken services of the travel agency can be used for demand prediction in future, or demand during a particular season or place, or by a particular community even. Hence, travel companies have to backed their decisions by some kind of analytics to make them impactful and fruitful.

5. DARK SIDE OF USING BUSINESS ANALYTICS IN TOURISM SECTOR

Business analytics has been considered as a tool to improve the performance of the businesses, to reach to the height of business excellence but it has its limitations. Some of these drawbacks or the negative side of the business analytics or big data related to tourism sector and specially the companies like makemytrip.com or booking.com has been mentioned in this section.

1. **Manipulative reviews or feedbacks:** Manipulative or fake data used for any kind of analytics will automatically lead to wrong insights and failure of business strategies. People on tourism related websites sometimes give fake reviews or feedbacks, or feedbacks under some influence or through knowns or fake email ids, to get the reputation or highlighted in search process by the tourists, which makes it difficult for the tourism companies to use such data. Any kind of reviews analysis can lead to wrong information in such cases.
2. **Breach of privacy:** openly accessible data and using it for the business purpose cause no harm to anyone, but using the personal data of people by breaching the privacy of individuals make the exercise of big data analytics unethical. In case of travel companies, information feed by the customers, are supplied to the credit cards agents, banking and insurance products agents, or online booking sites which make use of customer's data who travels to national or international tourists places frequently, which is unethical. This type of practices by travel companies is another dark side of business analytics.
3. **Right tools for right data:** Data analytics can't prove to be helpful or worthy until and unless, it is being analyzed using correct tool or technique, like testimonials or blogs related data can be analyzed using text mining tool, while the number of booking in the hotels, cancellation rate can be analyzed using predictive analysis. Hence, only accessing and storing the big data is not at all sufficient, until it is worked upon by a team of expert data analysts.
4. **Loss of data or the server failures:** Use of data gives an ease to the tourism companies for developing dashboard for sellers, and the visitors, deriving cancellation rates, number of visitors to a particular security and the comparative stats. A very few requests of the customers are handled by the company offline, which makes it difficult for the companies in case of any data leakage, or the servers' failures due to any technical reasons, which leads to huge losses and even converted into lost customers and customer dissatisfaction.

6. CONCLUSION

Overall, it can be said that big data has power to build the corporate image of the travel companies, through customer engagement, brand positioning, customized solutions and through market segmentation. Data is powerful, the more you torture the data, the more it will confess to you, meaning here is that if data is used correctly, wisely then it has the power to improve the overall performance of the companies, by making its business excellent in all aspects. Travel companies are no exceptions to this, in fact, travel companies are more prone to data analytics as after e-tourism concept, whole of the operations of the travel companies depends on the data analytics. Hence, travel companies can make use of the business analytics by making it a part of the strategic decision making and can improve their business excellence.

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Biographies



Dr. Eliza has been working with Symbiosis Institute of Business Management Bengaluru, a constituent of Symbiosis International (Deemed University). She holds a Ph.D. in Management. She has 12 years of work experience in academics and research. She has published 35 research papers in national and international journals and conference proceedings.



Dr. John Ben Prince has been working with Symbiosis Institute of Business Management Bengaluru, a constituent of Symbiosis International (Deemed University). He holds a Ph.D. in Management. His career of twenty years spans ten years in industry as well as ten years in academics. He has published in reputed journals and attended international conferences as well.