

Big Data Analytics: Saving Small Businesses in Entertainment and Hospitality

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Abstract: Small businesses in entertainment and hospitality play a significant role in the economy. They contribute to job creation, and have become another primary urban activity just like commerce and culture. They attract permanent residents, sustainable businesses and tourists to cities. The enterprises are notoriously known for having short lifespans, and this is due to 1) the inability and/or lack of tracking ever-changing market needs; and 2) the lack of evidence-based decision making by owners and/or managers. Big data analytics has been praised by many business leaders for elucidating insightful business information and providing evidence necessary for decision making. However, it has only been successfully used by big enterprises. This paper examines the importance of big data analytics to small businesses in entertainment and hospitality.

Keywords: Night-time economy, big data analytics, small businesses, entertainment and hospitality.

1. INTRODUCTION

Small businesses in entertainment and hospitality sustain short lifespans. This is due to the inability and/or lack of tracking ever-changing market needs and trends, and the lack of evidence-based decision making by owners and/or managers. This paper examines the role of big data analytics in small businesses in entertainment and hospitality. Section A describes these enterprises by defining their characteristics, economic role, and shortcomings. While Section B provides a description of big data analytics and the role it plays in business. The objectives of the paper are outlined in section 2, followed by methodology and results in sections 3 and 4, respectively. Conclusions are drawn in section 5.

A. Small businesses in entertainment and hospitality

Small businesses in entertainment and hospitality play a significant role in the economy and tourism [1], [2], [3], [4]. These include restaurants, bars, pubs, nightclubs, food and craft fairs (sometimes referred to as food and craft markets), cafes and lounges. They are often referred to as night-time economy [5], [6] because they usually host majority of their patrons after working hours in the evening. They are extremely busy on weekends and holidays, as most people visit them during these periods [7].

The night-time economy is worth about R440 billion [1], accounts for 1 in 8 jobs [8] in London, and employs over 1.3 million people [9] in the UK. It encompasses 4 main expenditure groups for households, namely: - 1) food and non-alcoholic beverages; 2) alcoholic beverages and tobacco; 3) recreation and culture; and 4) restaurants and hotels. These constitute 19.7% of the annual household consumption expenditure in South Africa which is about R339 billion [10]. The night-time economy contributes considerably to the revenues generated in many global cities, like Ibiza [2], Edmonton [4], Berlin [9], Las Vegas [11], and New York City [12] among others.

It attracts permanent residents, sustainable businesses and tourists to a city [4], since many people prefer glamorous cities that offer vibrant entertainment [5]. This is well illustrated in the case of Ibiza, where its tourism grew tremendously with the introduction of a vibrant night-time economy [2]. It has further aided the city of Las Vegas to lure millions of tourists [13], and contributes heavily to London's superiority in tourism [1]. Along with commerce and culture, night-time economy is another primary urban activity [14].

Cafes and restaurants provide food and non-alcoholic beverages for consumption [15], whereas pubs, taverns and bars engage in selling alcoholic beverages. Some restaurants have bars to accommodate both. Nightclubs are described as venues for entertainment, dancing and socializing [5]. Food and craft markets are events at which people gather to purchase and sell goods they have made [16]. All these businesses attract a wide range of people keen to socialize, consume and be entertained.

Nightclubs, pubs and bars are popular among young people [17], while food and craft markets, restaurants and cafes are favoured by all generations. Depending on the theme and style of operation of the business, it can target a specific age group. Youth is more likely to frequently visit night-time businesses than the general population [3]. This is because of the excitement, novelty, and energy brought by these businesses [5], [17].

Businesses in the night-time economy are subjected to continual changes in trends and market needs which are induced by youth whom is mostly targeted. Young people are always looking for the next popular spot, and are dynamic in switching styles, forms of music and temporary communities [7]. As a consequence, these businesses are obliged to consistently reinvent themselves [3]. For these reasons, targeting this group becomes challenging and requires adapting to new trends and occasionally taking risky innovations [18].

The delicate part about keeping afloat and being attractive to customers in this market is tracking new trends. Nonetheless, this is opposed by the unwillingness and unreceptiveness to change which owners experience the longer they stay in business [19]. Between 2001 and 2016 about 1,220 pubs and bars in London have been shut down at a rate of about 140 per year [1]. Studies conducted by Parsa et al. [20] indicate that 59% of hospitality facilities fail in the period of 3 years. Some of the reasons of failure according to Parsa et al [20] are poor communication with customers, poor promotions, lack of original ideas, and inability to maintain operational standards thus leading to service gaps.

Though the industry is huge and contributes significantly to the economy, it sustains high failure rates. These failure rates expose the lack of support structures for which these businesses can utilize to successfully operate. Big data analytics presents itself as the best candidate support structure. Based on its tested aptitude by big companies [21], [22] it can be inferred with reasonable doubt that it will improve the success rate of small businesses in entertainment and hospitality.

B. Big Data Analytics:

Big data is defined as any collection of complex and voluminous data that exceeds the processing capability of conventional data management systems and techniques [23], [24], [25]. It is characterized by numerous features commonly referred to as V's [26], [27], [28], [29], [30], [31] namely: - volume, variety, velocity, veracity, valence and value [25].

According to Altintas and Gupta [25], the V's are defined as follows. Volume refers to the vast amounts of data that is generated exponentially. Variety refers to the increasing different forms of the data. Velocity describes the speed at which the data is being generated and the pace at which it is transmitted. Veracity refers to the origin and quality of the data, which describe its truthfulness and trustworthiness. Valence relates to the connectedness of the data. Value refers to the usefulness or worth that can be extracted from the data using various analytical techniques.

The analysis of big data involves inspection, cleansing, transformation, and modelling of the data with the purpose of discovering useful information like patterns and insights [32]. These are carried out by different tool types that include predictive analytics, data mining, statistics, artificial intelligence, natural language processing, etc. [26]. The analysis of big data is useful in decision making since it enables decisions to be evidence-based [33], [34], [35].

For this reason, big data analytics has become popular in business. It supplements the conventional business intelligence by providing information with insights into customer behaviour, supply chain efficiency, and numerous aspects of business performance [22]. It leads to smart business moves, more efficient operations, higher profits, and happier customers [21].

A study by Pearson and Wegener [22] reveals that businesses using big data analytics are: twice as likely to be in the top quartile of financial performance within their industries; five times likely to make decisions quicker than their competitors; three times likely to execute decisions as intended; and twice as likely to use data when making decisions.

In a 2012 survey, 9 out of 10 global business leaders revealed that data has become as important to business as physical assets, labour or capital [36], [37]. The adaption of data-driven innovations by companies has increased their productivity

by 5 - 10% more than those that did not adapt [36]. For example, in 2013 a zoo in Washington utilized data analytics which helped them with staffing, reduced overall costs, and increased membership by 13% in the first quarter of 2014 [38].

Big enterprises like Google, Facebook, Walmart, Amazon, etc. are using big data in decision making to their advantage [39]. The application of big data analytics in business has been praised by many business leaders [36], and its significance has been illustrated by top performing companies [22]. However, studies focusing on its application to small businesses in entertainment and hospitality are very scarce, probably due to its little or no deployment in the sector. The reason could be that its deployment presents several challenges, like data collection and storage, skill requirement for analysis, technical issues and enormous costs [30], [24] which small businesses cannot overcome. As a consequence, this discourages the owners and/or managers from investing in big data analytics.

2. OBJECTIVE

This paper sets out to provide a pragmatic descriptive study of how big data analytics can be beneficial to small businesses in entertainment and hospitality. This will encourage the enterprises to invest in big data analytics, even if they cannot afford, or begin seeing value in its practices. Since the success of these businesses depends highly on providing sentimental value to its clients, in addition to experiencing high competition, it becomes critical for them to adopt big data analytics.

3. METHODOLOGY

A survey methodology was followed to provide a descriptive study of how big data analytics can be beneficial to small businesses in entertainment and hospitality through sampling customer expectations. The sample data is not big data; however analytics are performed on it to extract value. The results thereof signify the extent to which big data analytics will go in conveying valuable information for decision making in these businesses.

The survey was designed to extrapolate sentimental values which people perceive when they 'go-out', i.e. visit small businesses in entertainment and hospitality. These are the values which people (clients) are willing to take effort and pay for. The survey consisted of the following questions:

1. What are 5 things that come to your mind when you think about 'going out'?
2. How much do you 'go out'? {Answer choices: Always, Frequently, Sometimes, Rarely, Never}.
3. Which age group do you belong to? {Answer choices: 15-19, 20-24, 25-29, 30-35, 35+}.

The survey was created using a tool called SurveyMonkey™. It was selected for its ease of use. The survey was carried out from 01 January 2018 to 15 February 2018. It was distributed by sharing an anonymous survey link through a social media platform called WhatsApp™. Participants were randomly selected, and encouraged to share the survey link with their contacts and friends upon completing the survey. The responses are presented in section 4 and were analysed as follows:

- Responses to questions 2) and 3) were tabulated into activity and age distribution tables respectively, depicting answer choices against percentage of participants.
- Responses to question 1) were presented in bar and network graphs. The bar graph ranked frequency of word occurrences, while the network graph depicted the relationship of the words.

The limitations of conducting the survey in this manner are as follows: Firstly, WhatsApp™ is only visible to contacts stored on a mobile device. Thus biases may arise from the fact that majority of people store contact numbers of people whom they share similar characteristics with. Secondly, 207 people participated in the survey; using a sample with more participants might yield different results. Lastly, using more questions instead of three could have provided further insight.

4. RESULTS

In performing the analyses, responses to questions 3) and 2) are respectively tackled first – since they provide details and clarity about the individuals who partook in the survey – then followed by responses to question 1). Table 1 presents the age distribution of participants, while Table 2 presents the activity distributions.

TABLE 1: AGE DISTRIBUTION OF PARTICIPANTS.

Answer Choices	Responses
15-19	6.06%
20-24	32.32%
25-29	49.49%
30-35	8.08%
35+	4.04%

TABLE 2: ACTIVITY DISTRIBUTION OF PARTICIPANTS.

Answer Choices	Responses
Always (<i>twice or more times a week</i>)	4.00%
Frequently (<i>once or more times a fortnight</i>)	35.00%
Sometimes (<i>once or more times a month</i>)	34.00%
Rarely (<i>once in 3 months</i>)	26.0%
Never	1.00%

Most individuals in the survey are in the age group 25-29 followed by 20-24, as shown in Table 1. These two age groups constitute about 83% of the participants, which is coincidentally the largest group of youth in South Africa [40]. The rest of the other participants are scattered fairly evenly over the rest of the age groups. Table 2 shows that most individuals go-out ‘Sometimes’ and ‘Frequently’, constituting 69% of the participants. It can be inferred that majority of the population do participate in going-out activities, especially youth, and this is consistent with literature [3].

Fig. 1 shows priorities for most individuals when they go-out. As a business owner and/or manager, this becomes a guidance to prepare for in meeting customer needs. Some of the items mentioned cannot be directly influenced by the business owners (like people, laughter, etc.); however owners can make their businesses conducive for them – as long as they are aligned with their business purposes.

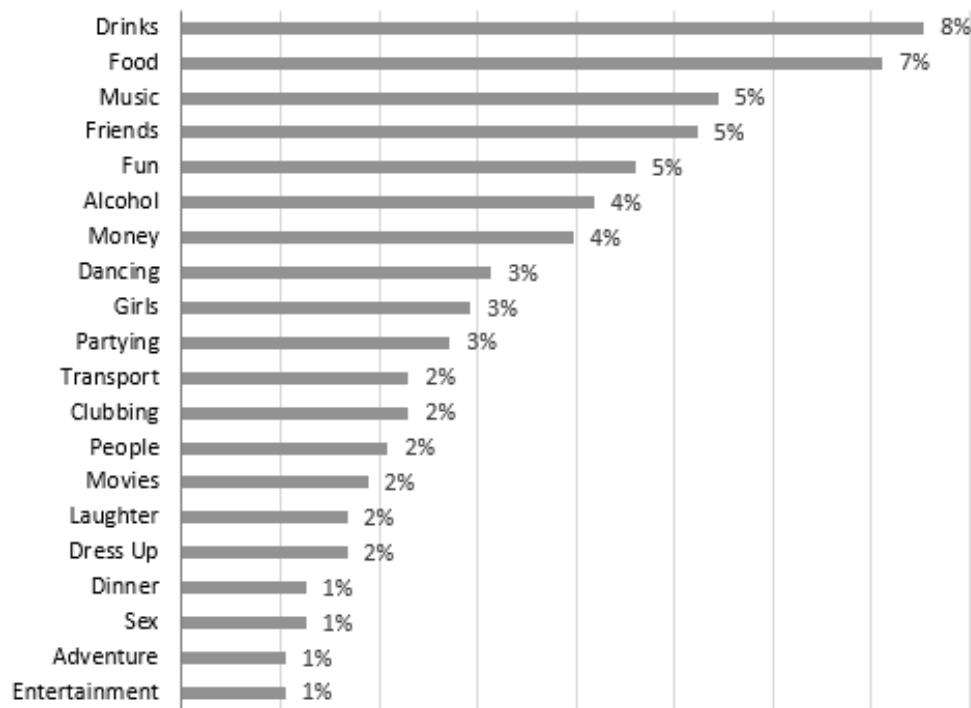


Fig 1: Top 20 of things which people think about when they plan to go-out.

To extract further value from information presented in Fig. 1, a network graph presented in Fig. 2 was constructed using VOSviewer™. The network graph is set out to assist business owners understand customer behaviour, and thus take this into consideration during decision making.

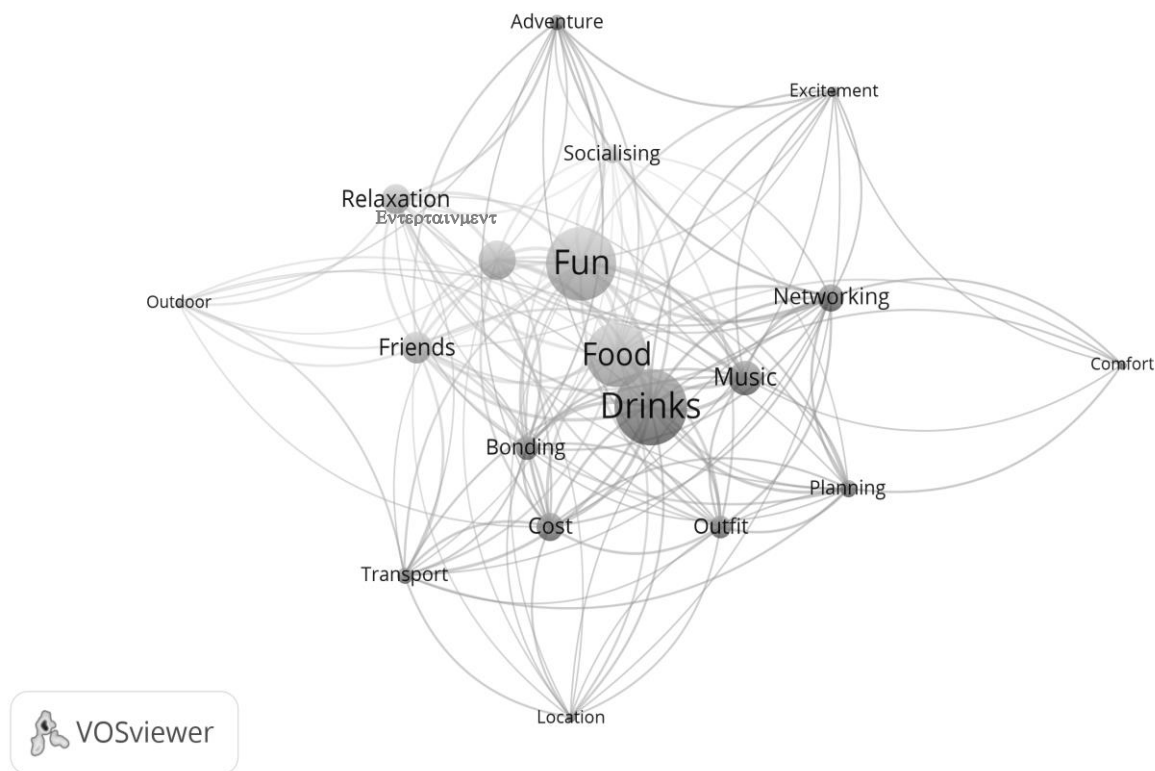


Fig 2: Network graph of 1st question responses.

The circle size represents the importance of the data. The lines between the circles indicate that the data points relate, and the distance between circles illustrate the closeness or affinity of the data points. Using the 5 words which participants listed, word pairs were created within each response. Every time a pair occurred in other responses, a strength point was awarded to the pair. For example, if 'food', 'drinks' and 'music' were listed in that order, pairs created would be 'food-drinks', 'food-music' and 'drinks-music'. The pairs are dictated by the order of responses, thus making 'food-drinks' unique and different from 'drinks-food'.

Note that due to too many similar words, categories were developed in performing the analysis. The following insights can be gathered from Fig. 2:

- Three biggest elements which people consider when they go-out are 'drinks', 'food' and 'fun' – with the first two closely related as expected since they are consumables.
- Although 'fun' is critical it is sentimental unlike 'drinks' and 'food'. The latter two can be easily provided since they are physical. However, not everyone in the business can provide 'fun'. Thus, setting a stage for 'fun' can potentially distinguish one from competition and bring more customers.
- In setting a stage for 'fun' it becomes essential to observe elements which it is closely relates to, and use them as the starting point. For example, 'entertainment' and 'socializing'. With these elements in mind, one might invite a music band on a regular to provide entertainment, and probably re-arrange the place to allow customers to easily communicate and interact with each other. This might improve traffic.

There is other insight information which Fig. 2 provides, however this paper focuses only on the three mentioned to illustrate the usefulness of analytics. The results presented in this section can educate owners and/or manager about the target market. They can also be used as basis for decision making.

5. CONCLUSION

From the survey it is found that majority of people who support small businesses in entertainment and hospitality are between the ages 20 – 29 years old. The group visits these places at least once a month. Their priorities in 'going-out' are indulging in drinks, food and music while having fun and interacting with friends and other people. However, they place a high sentimental value on fun which its definition changes over time with market trends.

We learnt that by studying elements closely related to fun and their contribution to it has merits. It can help businesses discover insightful information which can set them apart from competition. We further learnt that this critical information can be extracted from using big data analytics.

We recommend a study about how big data analytics can be made easily and cost-effectively available to small businesses in entertainment and hospitality. This promises to have great impact on the economy since night-time economy businesses contribute significantly to job creation and tourism.

REFERENCES

- [1] Greater London Authority, "Culture and The Night Time Economy: Supplementary Planning Guidance," Greater London Authority, London, 2017.
- [2] J. R. Cardona and M. D. Sanchez-Fernandez, "Nighlife Sector from a Gender Point of View: The Case of Ibiza," *European Journal of Tourism, Hospitality and Recreation*, vol. 8, no. 1, pp. 51 - 64, 2017.
- [3] J. Miyakubo, "An Examination of the Non-Gaming Nightlife Entertainment Sector of Las Vegas Resort Casinos.," University of Nevada, Las Vegas, Las Vegas, 2009.
- [4] J. Peters, "The Nighttime Economy," ICMA, 08 November 2016. [Online]. Available: <https://icma.org/articles/nighttime-economy>. [Accessed 02 January 2018].
- [5] B. J. Berkely, "Positive Nightclub Impacts on Entertainment Districts," *Economic Development Review*, vol. 16, no. 2, p. 11, 1999.
- [6] F. Bianchini, "Night Cultures, Night Economy.," *Planning Practice & Research*, vol. 10, no. 2, pp. 121 - 126, 1995.
- [7] R. Hollands, "Divisions in the Dark: Youth Cultures, Transitions and Segmented Consumption Spaces in the Night-time Economy.," *Journal of Youth Studies*, vol. 5, no. 2, pp. 153 - 171, 2002.
- [8] Ernst & Young/ London First, "The Economic Value of London's 24 Hour Economy," Ernst & Young, London, 2016.
- [9] M. McDermott, "Culture Shock: Night-time Economy is More Than 24 Hour Partying," *The Irish Times*, 06 May 2016. [Online]. Available: <https://www.irishtimes.com/culture/heritage/culture-shock-night-time-economy-is-more-than-24-hour-partying-1.2638002>. [Accessed 29 November 2017].
- [10] Stats SA, "Living Conditions of Households in South Africa," Statistics South Africa, Pretoria, 2017.
- [11] C. Woodyard, "Casinos Struggle to Find Way to Deal in Next Generation," *USA Today*, 2004.
- [12] J. Aswad, "New York City to Name a 'Nighttime Ambassador' to Advocate for Music, Nightlife," *Variety*, 16 June 2017. [Online]. Available: <http://variety.com/2017/biz/news/new-york-city-to-name-nighttime-ambassador-1202469125/>. [Accessed 05 January 2018].
- [13] M. O'Brien, "A Gamble Pays Off," *Mixer*, vol. 4, pp. 48 - 50, 2000.
- [14] D. Campo and B. D. Ryan, "The Entertainment Zone: Unplanned Nightlife and the Revitalization of the American Downtown," *Journal of Urban Designs*, vol. 13, no. 3, pp. 291 - 315, 2008.
- [15] A. Whiteford, D. van Seventer and B. Patterson, "A Profile of the Cafes, Bars & Restaurants Sector in New Zealand," *Service IQ*, 2014.
- [16] COBUILD Advanced English Dictionary, "Collins English Dictionary," HarperCollins Publishers, 2018. [Online]. Available: <https://www.collinsdictionary.com/dictionary/english/craft-fair>. [Accessed 22 January 2018].
- [17] J. Northcote, "Nightclubbing and the Search for Identity: Making the Transition from Childhood to Adulthood in an Urban Milieu," *Journal of Youth Studies*, vol. 9, no. 1, pp. 1-16, 2006.
- [18] S. Friess, *Down on Its Luck: Las Vegas Used to be a Recession-Proof Oasis. Not Anymore.*, Newsweek, 2008.
- [19] R. Unger, "Bar-Nightclub Management," September 2017. [Online]. Available: <http://www.promotingnightclubs.com/1011-1.htm>. [Accessed 19 December 2017].

- [20] H. G. Parsa, J. T. Self, D. Njite and T. King, "Why Restaurants Fail," *Cornell Hotel and Restaurant Administration Quarterly*, vol. 46, no. 3, pp. 304-322, 2005.
- [21] T. H. Davenport and J. Dyché, "Big Data in Big Companies," SAS Institute Inc., 2013.
- [22] T. Pearson and R. Wegener, "Big Data: The Organizational Challenge," Bain & Company, Inc., San Francisco, 2013.
- [23] L. V. Satyanarayana, "A Survey on Challenges and Advantages in Big Data," *International Journal of Computer Science and Technology*, vol. 6, no. 2, pp. 115 - 119, 2015.
- [24] A. Bhadani and D. Jothimani, "Big Data: Challenges, Opportunities and Realities," in *Effective Big Data Management and Opportunities for Implementation*, Pennsylvania, IGI Global, 2016, pp. 1 - 24.
- [25] I. Altintas and A. Gupta, *Introduction to Big Data*, San Diego: University of California, San Diego, 2017.
- [26] P. Russom, "Big Data Analytics," TDWI (The Data Warehousing Institute), 2011.
- [27] P. Zikopoulos and C. Eaton, *Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data*, 1st ed., McGraw-Hill Osborne Media, 2011, p. 176.
- [28] T. Ivanov, N. Korfiatis and R. V. Zicari, "On the Inequality of the 3V's of Big Data Architectural Paradigms: A Case of Heterogeneity," ARXIV.org, 2013.
- [29] W. Raghupathi and V. Raghupathi, "Big Data Analytics in Healthcare: Promise and Potential," *Health Information Science and Systems*, vol. 2, no. 3, 2014.
- [30] N. T. T. Hoai, "Big Data - Opportunities and Challenges," *International Journal of Innovative Research in Technology and Science*, vol. 3, no. 5, pp. 1 - 5, 2015.
- [31] Big Data Alliance, "What is Big Data," 2017. [Online]. Available: <https://www.bigdata-alliance.org/what-is-big-data/>. [Accessed 05 January 2018].
- [32] A. Monnappa, "Data Science vs. Big Data vs. Data Analytics," 2017. [Online]. Available: <https://www.simplilearn.com/data-science-vs-big-data-vs-data-analytics-article>. [Accessed 09 January 2018].
- [33] S. Lohr, "The Age of Big Data," *The New York Times*, 2012.
- [34] F. Provost and T. Fawcett, "Data Science and its Relationship to Big Data and Data-Driven Decision Making," *Big Data*, vol. 1, no. 1, pp. 51- 59, 2013.
- [35] A. Gandomi and M. Haider, "Beyond The Hype: Big Data Concepts, Methods, and Analytics," *International Journal of Information Management*, vol. 35, pp. 137 - 144, 2015.
- [36] R. Davies, "Big Data and Data Analytics: The Potential for Innovation and Growth," 2016.
- [37] P. Simon, *Too Big to Ignore: The Business Case for Big Data*, New Jersey: John Wiley & Sons, Inc., 2013.
- [38] K. Kelleher, "What 3 Small Businesses Learned from Big Data," *Inc. Magazine*, 2014.
- [39] F. Khan, "Big Data Analytics - It is here and now!," Mumbai: SlideShare: LinkedIn, 2016.
- [40] Central Intelligence Agency, "The World Factbook," 17 January 2018. [Online]. Available: <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/sf.html>. [Accessed 21 January 2018].
- [41] Waze, Waze, 2018. [Online]. Available: <https://www.waze.com/>. [Accessed 01 December 2017].
- [42] Collins Dictionary, "Collins Dictionary," 2017. [Online]. Available: <https://www.collinsdictionary.com/dictionary/english/craft-fair>. [Accessed 19 November 2017].
- [43] H. Skinner, K. Kubacki, S. Parfitt and G. Moss, "Polish Nightclubs and Bars: Management Insights into What Customers Really Want," *Journal for East European Management Studies*, vol. 13, no. 2, pp. 154 - 169, 2008.