www.arpnjournals.com

BIG DATA FOR MOBILE APPLICATIONS IN RETAIL MARKET

P. Lakshmi Prasanna, P. Vidyul Latha, B. Sekhar Babu, M. Narmada, Chowdary Samhita, Roy Bhuri
and Varsha Kamireddy
KL University, Andhra Pradesh, India
E-Mail: pprasanna@kluniversity.in

ABSTRACT

A large torrent of data is being generated on a daily basis due to many recent technological developments (Web data, Health care, Retail industry, etc.) which cannot be managed by traditional data. So, big data fashion has been increased to capture this humungous amount of data. It has many unique features compared to the traditional data. Data is now not being seen as a by-product of a company/business but as a biggest asset. Data includes insights to customer needs, predicting trends in customer behaviour, regularizing of advertisement to suit varied customer predilection etc. The increase in the pliability and power of smart phones provides more opportunities for rising services to the customer. In the current Business firms, mobile commerce or M-Commerce has entered in retails, telecommunication, finance, services and information technology services. M-Commerce is not only being widely accepted but also it is being more used as a popular way of business/ commerce. This paper provides an overview of the unique features of big data over traditional datasets. In addition to this, the application of big data analytics in the M-Commerce (retail market) and the various technologies that make analytics of consumer data possible is discussed. Further, this paper will also present some case studies of how leading Commerce vendors like Flipkart, Amazon, Walmart Inc, Adidas apply big data analytics in their business strategies.

Keywords: big data, retail, smart phones, M-commerce, transactions.

INTRODUCTION

In the past few years, the capacity of the world to generate and exchange data has increased from 0.3 Exabyte, 1986(20% digitized) to 65 Exabyte, 2007(99.9% digitized). From 2007, the data generated is 2.5 petabytes of customer data in 2012. The growth of data is strengthened by the availability of cheaper computing and ubiquity of the internet. Nowadays, virtually everything is done electronically; people exchange information over the internet and engage in buying and selling via the internet. Ecommerce vendors have taken advantage of the use of the internet to market goods and services, enhance revenue and brand awareness. In the year 2012 a survey carried out on businesses in the United Kingdom revealed the following:

- Sales on Website totalled £164 billion, which represented 6% of business turnover (This is a 1% increment from 2011).
- 82% of businesses had a website, while 95% broadband Internet.
- 43% of businesses had social networks accounts, with 23% using social media to respond to customer opinions and questions [1].

This survey proves the point that exchange of electronic information via social media site has positively affected Ecommerce regarding revenue and brand awareness. However, with the advent of big data analytics there will be more informed/ data driven strategies for businesses communicate with customer. So that E-commerce vendors/businesses, can harness/analyse the tremendous data (Big Data) generated from Electronic Data Interchange (EDI), in order to gain better understanding of consumer behaviour. Such unique insight can be applied to improve service to customer, guide to business strategy, and provide democratized services to customers. The below Figure-2 illustrates furthermore, the significance of big data analysis to organizations (based on a survey carried out by Mckinsey on 115 leading organizations) (Wielki, 2013) A practical example of such E-commerce business is Amazon.com -by utilizing special software to analyse cookies and click stream on customer browsers, the firm can identify patterns in customers' habit of shopping and therefore can provide customized/democratized offers, advertisements and discounts to such consumer [2].

Definition of Big Data

There is no unified definition for the term "Big Data" at present. It is related to the enormous amount of data being generated [3]. However, big data is defined in the terms of 3 characteristics volume, velocity and variety also referred to as 3 V's. Variety refers to the data with heterogeneous nature (made up of unstructured and structured datasets), Velocity describes the speed at which data is captured (sometimes even 2 seconds lead to a change in the data generated), and Volume refers to the size of data generated (usually in Exabytes, Petabytes and Terabytes).

Due to these characteristics, it is impossible to effectively manage and analyse big data using traditional datasets. However, using modern tools and technologies (Hadoop Distributed files system) big data is effectively

managed (process, storage, real-time analysis). Moreover, when special data mining algorithms (machine learning and clustering algorithm) are introduced to the big data analytical framework, one can derive an insight from the data generated [4].
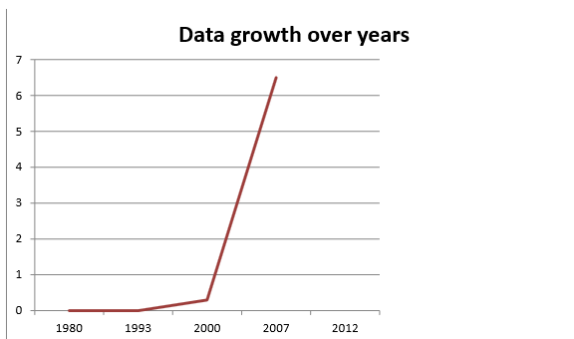
For the purpose of study, we will limit the study of big data analytics to three categories as follows:

Social media analytics

Refers to analysis of large volume of data generated from social media applications/sites [5].
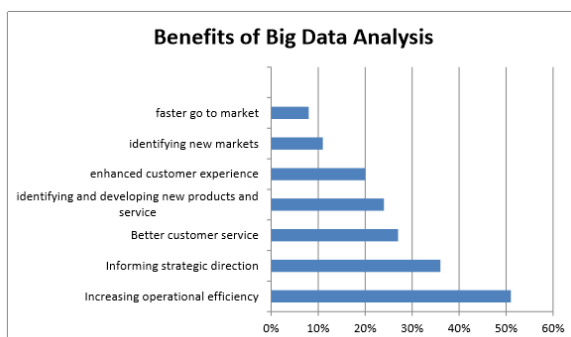
Predictive analytics

Refers to use of data to forecast on consumer behaviour and trends [6].

Mobile analytics

This refers to the analysis of large volume of data generated from mobile phones, tablets and mobile gadgets [7].

EXISTING SYSTEM

The existing system is that the data being generated by an organization is relatively very small and can be easily managed by the traditional data sources. The data generated may only be related to the site the customer mostly viewed, frequency of visits, number of people visiting the site at a time, data viewed etc., and this is done through their websites and later these websites (flipkart.com, Amazon.com, Jabong.com, etc.) are used for

collecting data on a large scale based on the customer behaviour or shopping behaviour. Electronic Commerce also known as E-Commerce means trading products/making transactions through the internet. All the retail industries come under E- Commerce [8].

PROPOSED SYSTEM

The existing system is only till desktops. Now, we want to analyse the retail markets being used in Smartphones through retail applications like FlipKart, Snap deal, Amazon, etc. using Big Data. Big Data relates to the data being noted after he enters the site- .

Once customers are on a site, start to examine all the products they explore. Identify who simply looked at a product landing page and left, and who drilled down further. Who viewed extra photos? Who read product reviews? Who looked at detailed product specifications? Who looked at shipping information? Who took advantage of any other information that is available on the site? For example, identify which products were chosen for a "Compare" view. Last, it is easy to identify which products were added to a wish list or basket, as well as if they were later removed. One very interesting capability enabled by web data is to identify product bundles that are of interest to a customer before they make a purchase [9]. M-Commerce is the buying and selling of goods and services through wireless handheld devices such as cellular telephones (smart phones) [10].

ADVANTAGES OF PROPOSED SYSTEM OVER EXISTING SYSTEM

- **Ubiquity:** The use of smart phones enables the user to receive information and conduct transactions from anywhere and from anyplace.
- **Accessibility:** Mobile device enables the user to be contacted at virtually any time and place. The user also has the choice to limit their accessibility to particular persons or times.
- **Convenience**: The portability of the wireless device and its functions from storing data to access to information or persons.
- **Localization:** The emergence of location-specific based applications will enable the user to receive relevant information on which to act.
- **Instant connectivity (2.5G…):** Instant connectivity or "always on" is becoming more prevalent will the emergence of 2.5 G… networks, GPRS or EDGE. Users of 2.5 G services will benefit from easier and faster access to the Internet.
- **Personalization:** The combination of localization and personalization will create a new channel/business opportunity for reaching and attracting customers. Personalization will take the form of customized information, meeting the users" preferences, followed by payment mechanisms that allow for personal information to be stored, eliminating the need to enter credit card information for each transaction.

ARPN Journal of Engineering and Applied Sciences

- **Time sensitivity:** Access to real-time information such as a stock quote that can be acted upon immediately or a sale at a local boutique.
- **Security:** depending on the specific end user device, the device offers a certain level of inherent security.
- Customer Satisfaction and Warranty Analysis.
- Competitor market penetration Analysis.
- Product feature and usage analysis.
- Healthcare/ Epidemic Research and Control.
- Future direction analysis [11].

THE BIG DATA ANALYTIC TECHNIQUES AND ITS APPLICATION IN M-COMMERCE

a) Large volumes of data are being generated everyday by retailers across their supply chain. This data is mainly generated across Omni-Channel retailing which nothing but concentrating on the experience of customers through all the available shopping channels like mobiles, televisions, computers, radios etc. In these recent years, Smartphones, tablets, social networks and online payments etc. have been feeding a massive explosion of structured and unstructured data known as Big Data.

b) This data has led to great change in E-commerce sector where the data has turned into a biggest asset providing details about the customer like the needs of the customer, predicting customer behaviour, advertising according to consumer's varied taste and meeting customer's demands. In this paper, we are analysing the M-commerce sector and how big data has been beneficial for the retail industry through the Smart phones. [12].

c) Now-a-days Smartphone's have become a technical necessity in human life, through which the people are in touch with social media all the time. Through social media, the personal details and interest of the customer can be known using text mining and sentiment analysis. Text mining is the process of using the text on blogs and social media networks to make conclusive decisions. Sentiment analysis is used to predict positive or negative reviews of a particular product in retail market. This analysis is made using Machine Learning Algorithm which includes tokenization, feature extraction and classification methods.

d) The shopping applications use product recommenders based on clustering algorithm. In this algorithm, the customers having similar preferences are grouped into a cluster and are given unique identifier. There are also location based advertisements which use the location of the customer and advertise about the markets and sales nearby him/her.

CONCLUSIONS

Finally we will conclude with proper analysis of big data analytics application to the M-Commerce sector in the retail industry and also the benefits of mobile applications compared to web applications by applying the algorithms we chose, to the real time data we collected revealing what kind of analysis is being done for the development of M- commerce and also what can be done to increase the number of valuable customers. We will also predict the future scope of mobile applications in retail market.

REFERENCES

[1] David Matthews.2012.Ecommerce and ICT Activity.

[2] Uyoyo Edosio .Big Data Analytics and its Application in E-Commerce Using Case studies of Adidas, Walmart and Amazon.com.

[3] In search of a definition for Big Data at: http://www.datascienceassn.org/content/search-definition-big-data.

[4] The 3 V's of Big Data and their Technologies at: http://think.withgoogle.com/mobileplanet/en/graph/?country=in&country=us&category=MOBSHOP&topic=Q49&stat=Q49_01&stat=Q49_02&stat=Q49_03&stat=Q49_04&stat=Q49_05&stat=Q49_06&wave=2013&age=all&gender=all&chart_type=&active=stat.

[5] Social Media Analytics at http://www01.ibm.com/software/in/analytics/solutions/customer-analytics/social-media-analytics/.

[6] Predictive analytics at http://www.webopedia.com/TERM/P/predictive_analytics.html.

[7] Mobile analytics at http://www.netbiscuits.com/mobile- analytics/.

[8] 5 ways Big Data is changing Ecommerce at http://www.retentionscience.com/5-ways-big-data-is-changing-ecommerce/.

[9] Bill Franks .Taming the Big data tidal wave: finding opportunities in huge streams.

[10] Mobile commerce at http://en.wikipedia.org/wiki/Mobile_commerce.

[11] Niranjanamurthy M, Kavyashree N, Mr S. Jagannath, Dr. Dharmendra Chahar. Analysis of E-Commerce and M-Commerce: Advantages, Limitations and Security issues.

[12] Srinivas N, R. Harnessing the power of big data: Big opportunity to retailers to win customers.