

The Relationship between Unified Communications and Big Data Analytics



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ABSTRACT

This paper looks into the relationship between Unified Communications (UC) and Big Data Analytics (BDA). UC has been adopted in many organizations to enhance communications while BDA has been adopted to solve the existing problems. UCs is the integration of a broad range of communication tools to provide an avenue for the most efficient exchange of information. The paper utilized the qualitative approach for data analysis. The results of the research provide evidence of a relationship between Unified Communications and Big Data Analytics where Unified Communications generate large volumes of data from different sources while big data analytics is used to extract useful information from this data.

Key words : Big data, Unified Communications, Big Data Analytics

1. INTRODUCTION

There are many uses of big data analytics among them establishing the existing patterns, market trends, and other information that is very significant in business operations. For instance, big data analytics may be used by a company to determine customer preferences and tune their products or services towards these preferences. In big data analytics, the key sources of data are from online social media and ecommerce, such as Facebook, Amazon. Companies also gather information on the activities conducted by their users on their sites. The other sources of gathering information are from mobile devices, such as smartphone, appliances or sensors through a phenomenon referred to as Internet of Things (IoT). This data is however useful if only analyzed.

The article will be looking into the relationship between the UC and big data analytics. To improve reliability, many companies have adopted UC systems that ensure real-time dissemination of information. As a result of this communications, the companies end up generating different kinds of data. This data therefore needs to be analyzed in order to find solutions to the existing problems. The UC yields big data; therefore, the article show how analyzing the data

obtained from UC systems is a big data analytics problem. The article will be looking into the relationship between the UC and big data analytics. Companies turn into UC to generate timely response to all feedback received [18].

Most companies that generate big data find numerous difficulties in analyzing the data and other processes related to the data. This has led to numerous debates among researchers concerning the policy development and analysis of big data, the possible uses and applications of big data and the governance of this kind of data [11]. This research, therefore, aimed at investigating the relationship between UC and big data analytics..

The world can be portrayed as the data age although it is almost impossible to determine the exact volume of data available. The data is derived from diverse sources with major contributors being social media sites such as Facebook, which hosts billion of pictures, each occupying one petabyte. However, very few people understand the importance of this data.

The study employed a qualitative approach which allows researchers to interpret phenomena by collecting various empirical materials such as visual texts, life stories and case studies [14]. The researchers conducted a critical review of literature from related articles. The articles used for the systematic review were obtained from online libraries such as Ebscohost, Proquest, and Google Scholar among others. The aim of the search was to identify the relationship between UC and BDA.

With the expected increase in data volumes in coming years, the organizations and individuals should understand the value of big data analytics. The article also exposes people to the current trends in UC and big data analytics. It also shows the relationships between the two concepts.

2. LITERATURE REVIEW

A. Overview of UC

UC was initially written as UC&C to include collaboration. Today, collaboration is considered the motivating factor behind the adoption of UC [18]. The components of UC include voice and video, and mail and messaging among others. Business intelligence and speech recognition are also included as components of UC. The main characteristic of the UC systems is presence, which is the availability of an indicator showing whether the individuals are busy, available, or offline. The UC systems are implemented in three stages. First stage is establishing a proper plan, second stage is user profiling and the final stage involves crucial technology decisions [20].

B. Overview of Big Data Analytics

Big data comprises of biometric data, machine-to-machine data, and human-generated data. The technology specifically meant for data storage and analysis was first introduced in the 1970s. There are different approaches when dealing with big data analytics. One of them is classical data warehouse which utilized when dealing with large quantities of unstructured data. It has three layers with first one being staging area, second layer is integration layer and the final layer is analysis layer. The other approach is real-time data processing. Real-time data processing systems are faster when handling larger amounts of data every second.

C. How Big Data Analytics improves the use of Unified Communication

There are several factors that a company consider while adopting a communication infrastructure. They include considering the expenses involved, have a strategic vision on which project is based, and consider legal and security issues before the establishment of UC systems. Implementation of UCs should focus on business processes and be connected with the enterprise strategy.

The purpose of big data is to identify problems and offer solutions. Therefore, if UC system cannot collect and store data, it becomes difficult for analyzing hence such solutions will not be offered. According to [2], big data analytics boosts the operational efficiency of UCs. Big data improves UC and VoIP by providing companies with the information they need to improve their infrastructure, security and other aspects in their operations. Big data analysis enables UC to be changed into customer intelligence tool. It also helps companies to track UC cost savings.

Exploring the benefits of Microsoft unified communications give insight into the benefits of UC in general. Different means of communications are fused into one which makes it easier for public to communicate

[13]. UC allows unified messaging; the users have Anywhere Access which means that data is accessible from different devices in varying locations. Big data is considered as an additional efficiency in the different process of organization such as production. Various sectors can use real-time data to monitor the progress of different process. Big data also can offer cost reductions as well as considerable improvements in service offerings. It also facilitates attainment of various objectives such as financial benefits through big data [4]. Big data creates new growth opportunities through enhanced information flows. Big data also presents business insights than traditional data obtained from transactional systems that help improve the interaction between companies and consumers [16].

The market offers varying UC tools. According to Microsoft [12], the factors leading to development of UC are placed into four groups. They include communication costs, communication overload, disparate and complex network, or problems relating to partners, customers, and team. The firms have adopted UCs to boost efficiency of their workers, and raise organizational competitiveness [21].

3. RELATIONSHIP BETWEEN BDA AND UC

The analysis method used is based on the UC source data. The method in which UC data is obtained determines the analytic method that will be used. The first one is Text analytics where textual data is obtained from emails, customer feedback from social media, and others. Text analytics is conducted through Information Extraction (IE), text summarization, question answering (QA), and opinion mining techniques [6]. Second one is Audio analytics where its data is obtained from telephone calls or audio conferencing. The analytics approach to audio is through transcript-based known as LVSCR. The audio files are transcribed using ASR algorithms with the help of a predefined dictionary to help identify words [15]. The third is video analytics where its data is obtained from CCTVs, video conferencing and other video sharing platforms. Video analytics are very useful in security and surveillance companies that use automatic systems [17].

Large sets of data are obtained by companies from different sources in different forms. This data contains hidden information which can be extracted using BDA and UC. According to Barlow (2013), there have been new BDA technologies that are employed to quickly and cost-effectively analyze large amounts of data. Chen and Zhang [3] established that the commonest analytical techniques utilized to make big data analytics usable and feasible to end users are data mining, machine learning, neural networks, signal processing, and visualization. Other analytic techniques that are used include learning rule, cluster analysis, crowd sourcing, and text analytics [10]. The common tools employed in the analysis of big data include Hadoop, Apache Spark, and Apache Storm.

Analytics of the big data gathered from the UC allows an organization to gain an insight with regard to the engagement between staff and between employees and customers as well as capabilities within the organization [5]. The information gathered from such data would help in the management of workflows, knowledge, collaboration, communication, and oversight.

4. THE CURRENT TRENDS IN BDA

The current market trends are that the organizations are turning into social media to establish a strong connection with their consumers. BDA of the data gathered from these sources to learn the behavior of customers (Burton, 2011). The BDA of data gathered from Facebook and Twitter can be used to predict the intent of the users. There are more than 28,000 multi-media messages (MMS) that are conveyed in every second across the world while Twitter handles more than 9, 100 of tweets in every second, produced by roughly 550 million active users [7]. From this amount of data, organizations can gather, store and analyze it to their benefit. Big companies such as Microsoft, Oracle, and Facebook have initiated big data projects aimed at solving existing data management problems [3]. With Unified Communication combining voice, video, chat, email and web communications, it means that large amount of data is obtained. From this data collected, BDA can be integrated in UC systems to make analysis of the data easy and help make the necessary conclusions based on the identified patterns and trends.

UC is a combination of various communication tools that mean that UC data is obtained through different tools [9]. The sources of UC data are; Instant Messaging (IM), emails, video/voice/web conferencing, fax, calls and messages. The characteristics of UC data are; data is derived from various sources and in large volume, it has high velocity, it can be useful or useless depending on how the analysis has been done on the collected data and finally UC data is either public or private [19]. UC data offer various applications and benefits after being analyzed. For instance, analyzing customers' feedback data helps a company improve their products or services. This is the best way to gain competitive edge as fast as possible.

There exists many opportunities for BDA in UC following recent changes in business operations. Research has established that 22% of all time is spent in social networking. Cisco (2014) found that many organizations are using the recent UC technologies to improve communications between employees and consumers and with this, many companies are incorporating social media applications to their UC systems to enhance collaboration and have real-time communication with their customers [8].

Unified Communications generate different kinds of data that that is valuable to the organization. This data is analyzed to provide useful information that allows organization address existing problems and improve value of their services. Organizations should therefore employ the big data analytics from data generated using UC because it will

give them competitive advantage. The predictive analytics provides organization with predictions of future customer behaviors as well as trends in the market. Organizations should consider implementing BDA in UC to tap valuable information that is obtained from various interactions within the organization, stakeholders and customers.

The existing challenges are through gathering of information and various ways in which BDA in UC analysis are performed. Data collected in UC is unstructured therefore it first needs to be extracted where the information obtained will be used for appropriate analysis. Time factor is another challenge to BDA in UC systems. The challenges of big data and analytics are that the traditional systems used to handle data rely on Relational Database management System (RDBMS). This traditional system cannot handle the large amount of structured and semi-structured data generated today [3]. When using RDBMS, data may not be well represented which reduces its value making the process of data analysis much complex. New challenges arise with adoption of new technologies. Big data analytics requires IT specialists. Privacy and security may also be a challenge in big data analytics.

5. RESULTS AND DISCUSSIONS

Big Data is a key aspect during the assessment of most of the analytical models used today. Data accuracy is a major point to consider when dealing with any kind of data. However, the quality of data differs with regard to the domain such as risk management, medical diagnostics, or forecasting of sales. Other key considerations in the analysis of big data are the completeness, latency, interpretability, security and traceability of the data [1]. The study sought to find out the relationship between UC and BDA.

The findings of the article established that there exists a relationship between UC and BDA. UC generate large volumes of data from different sources through various UC components. BDA is used to extract useful information from this data. It is used to establish the kind of relationship that exists between employees and consumers, market trends, and customers' satisfaction among others. The article also revealed that there are various methods employed in big data analytics depending on the nature of data acquired.

6. CONCLUSION

Big data analytics is utilized in various ways. Companies can utilize data from social media and ecommerce to determine their customer preferences and direct their products towards meeting the customer needs. Unified communications, on the other hand, are used to provide real-time information. UC, therefore, provide different kinds of data that require to be analyzed in order to yield meaningful information. Through the review of literature, the study established that there is a relationship between UC and BDA whereby UC disseminates data while BDA provides meaning from the data provided. However, further research needs to be done on the reliability of big data analytics in the provision of accurate information. Other methods of managing and analyzing data provided by

UC need to be explored. The research is important for organizations that have challenges in dealing with the diverse data disseminated by UC.

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