A Study on Analytics of Big Data and Business Intelligence- A Review

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Abstract—*Big data is one of the most discussed and possibly least understood terms that is used in the realm of business these days. This paper has introduced some of the critical characteristics of big data in a nutshell which suggests several approaches to improve Business Intelligence. It has also studied various methods and techniques in order to help analyzing big data from its business intelligence perspective. Furthermore, the paper shall discuss the co-relations between big data analytics and Business Intelligence. The primary goal of this paper is to offer a broader insight in business intelligence studies via employing big data analytical tools and techniques which have been developed by various researchers.*

Keywords: *Big data, business intelligence, e-commerce, analytics of data, big data analytics.*

1. INTRODUCTION

In the last couple of years, big data and its analytics had a significant progress. The recent emerged big data and technologies which include big data analytics, not only has great impact in changing the way e-services and e-commerce operate, but also they have created some huge market opportunities for academia and businesses [19, 8]. Issues within processing, storage, management, search, backup, practical application and other abilities of such have to do with the data.

Big data has now turned into a mainstream market which is widely used amongst organizations, industries and different regions in the world. Over the past two decades Business Intelligence has attracted a lot of attention from commerce, academia, management and business. The term BI is referred to an organization's capability in utilizing the data that it collects in its daily business routine [1]. BI has a significant impact on improving an organization's capabilities in business through introducing new potential opportunities that would enhance an organization's decision making process. So far most of the solutions given by BI focus on structured and internal data of enterprises whereas much of its important information within its unstructured aspects remain unknown and therefore one is unable to have a clear insight into its reality.

In the second part of this research the background of the respected study has been reviewed. In the third part, the paper briefly discusses the big data characteristics. The fourth part shall deal with the Big Data Analytics Service-Oriented Architecture (BAOSA). The fifth part, it negotiates how big data analytics applied on business can immensely enhance its capabilities. In the sixth and final part of the paper, an overall conclusion on big data tools and business intelligence is offered.

2. BACKGROUND OF THE STUDY

2.1 Big Data

We have briefly described what big data is in this section, how it is associated with business intelligence and what are the big data challenges from the perspective of business intelligence? The authors proposed five important characteristics of big data in paper [18, 7], namely volume, variety, velocity, veracity and value. These are called 5Vs of big data. The Vs signifies massive data volume, variety of data type, varied data generation velocity, data veracity trustworthiness and higher veracity with lower processing value.

Big data is used to gather vast and complex dataset. That Processing using conventional data mining techniques and tools becomes difficult. Big data analytics ' main objective is to assist businesses make informed business decisions by allowing predictive modellers and data scientists. Additionally, extract and transform useful information from a large dataset into a comprehensible structure for further use [9, 5]. Big Data can provide inspiration of new product to add and ideas of new services and also can bring collaboration between diverse sub-firms to upgrade the functioning for minimizing the cost associated with it [21, 15].

2.2 Business Intelligence

The scientists suggested business intelligence and data in [3, 10, 7] stating that business intelligence involves all the applications, activities and techniques required to collect, analyze and visualize business data in order to promote both operational and strategic decision-making. Currently, the domains such as data mining, Data Warehousing (DW) and announcing just like OLAP secured by business intelligence. Additionally, business intelligence technologies demonstrate the ability to handle massive amounts of structured and

unstructured data to assist recognize, make new business strategic opportunities or develop. According to [9, 4, 19] business intelligence had the option of improving the organization's success by making better decisions using information that was not provided by regular reporting.

2.3 Big Data Analytics Challenges in Business Intelligence

Challenges and opportunities dependably travel along with each other. Applying analytics and business intelligence solutions to big data creates a variety of opportunities and challenges [2,11,28]. Some of the relevant challenges related to big data and business intelligence are listed below [29, 27]:

- Transport and Storage
- Processing and Management
- Heterogeneity and Variety
- Security or Safety
- Privacy or Confidentiality
- Sharing of information and Data accessing
- Technical or Hardware
- Data preparation, Quality, and Trustworthiness
- Efficient storage and search distributed

3. CHARACTERISTICS OF BIG DATA

Figure 1 shows 5 Vs of big data from different dimensions [18,30,14,23].
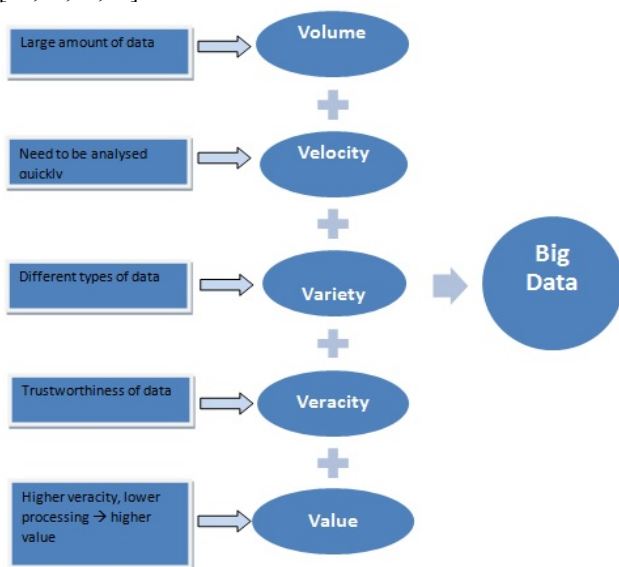
Figure 1: 5Vs of Big Data from different dimensions.

- Volume

Alludes to the amazing amount of data created every second by social media, cars, photographers, video, phones, and so on. The main attraction of big data analytics is the benefit of the ability to process large amounts of information.

- Velocity

Velocity of big data refers to the generation speed of new data and the speed of movement of the data. Each second of consistently data is expanding now big data technology enables us to analyze the data while it is being created, while never placing it into data bases.

- Variety

There is huge diversity of data sources and data types. Big data isn't constantly structured data, 80 percent of the data on the planet today is unstructured data. Therefore, cannot easily be placed in to tables or relational databases. We would now be able to harness varied kinds of data with big data technology.

- Veracity

Veracity is the data's authenticity and confidence. With a lot of big data forms, accuracy and quality are hard to control.

Value

Denote ability to transform a tsunami of data into business. Most importantly, business is making a case for any attempt to gather and use big data.

4. BIG DATA ANALYTICS SERVICE-ORIENTED ARCHITECTURE

This part will follow the services-oriented architecture of big data analytics and review each of BASOA's main players. First, we offer overview of service-oriented architecture.

### 4.1 Service-Oriented Architecture general overview

A basic service concept is service-oriented architecture (SOA). For any web services, this SOA contains three players and three basic operations [32,19]. Service provider, service requestor and service broker in particular.

A service provider that needs to offer services publishes its services by placing fitting passages into the service broker and it is the web service owner. A service requestor utilizes the service broker to find suitable service, that is, a service that coordinates its necessities. Additionally, Service requestor is the web service's client or consumer. Subsequently, the service broker incorporates the exploration, selection, consultation, composition, suggestion, delivery or transfer of web services to the requester from the service provider. Publishing, finding and binding are the three crucial tasks.

4.2 Big Data Analytics Service-Oriented Architecture (BASOA)

BASOA is the enhanced version of SOA. The subsection proposes BAOSA and then looks into each of the BASOA's main players.

Unlike the traditional SOA, as illustrated in Figure 2, BASOA sets out general services for services related to big data analysis.
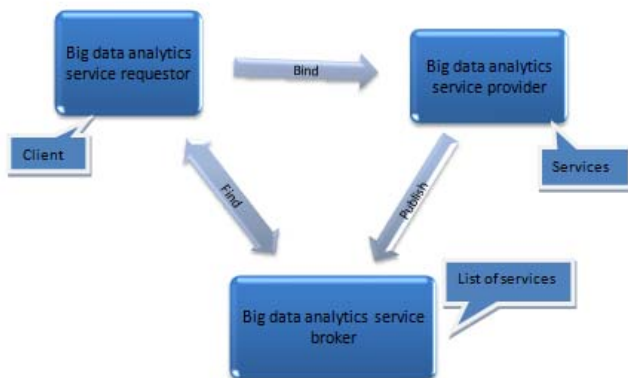
Figure 2. BASOA: A big data analytics SOA from different dimensions.

As illustrated in Figure 2, BASOA comprises of three layers, viz, big data analytic service provider, big data analytic service requester and data analytic service broker. All three layers were discussed briefly as below:

1. The service provider for big data analytics includes vendors of analytics, developers of analytics, systems of analytics or software and other intermediaries capable of providing analytics [1, 19, 8].

2. The service requestor for big data analytics includes-commerce system and business information systems. The service requestor for big data analytics also includes governments, organizations and all decision-makers at the business level such as CFO, CEO, CIO and managers [1, 19, 8].

3. The service brokers for big data analytics are whole the elements that empower the improvement of big data analytics services, which join social media and popular presses traditional media, counselling organizations, scholars and students at universities, etc. [1, 19, 8]. All of these utilization a variety of techniques and methods in overall and data analytics, web analytics, Specifically business analytics, to improving understanding of analytics of big data.

5. BIG DATA ANALYTICS TO IMPROVE THE INTELLIGENCE OF BUSINESS

Business intelligence and big data improve the operation of business, their profit margins, and make faster, brighter business decisions as well. Big data analysis could be used to guide critical business decisions and improve the performance of business. It can also assist in decision-making processes [16]. To use big data efficiently, improved understanding of mechanisms for decision-making and information processing based on different contexts is required. Companies need to emphasize data variety and data complexity reduction in order to implementation of big data analytics to make decisions.

Analytics of big data can help organizations to make enormous efforts to improve consumer loyalty, monitor inventory network opportunities, generate focused knowledge, and provide ongoing business information to help them make significant choices [10, 26, 11].

Big data analytics can improve business and service management [20]. Big Data can also provide inspiration for new products and ideas for new services, as well as collaboration between various sub companies to upgrade the functionality to minimize the costs associated with them [21].

Big data analytics generally has five primary advantages. First, it improves data type accessibility. Second, by capturing related data and enhancing performance, identify data variation. Third, it helps categorize the associated population to better understand the customer's needs. Fourth, it adds computerized calculations to basic leadership by uncovering significant bits of knowledge. Fifth, it gives rise to new action plans, leaders, items, and governments. [22]. One of big data analytics' most important uses is development of learning, the development of new administrative standards and the economy dependent on this.

Joint effort of management personnel's and information experts can improve the viable usage of big data in basic leadership, in any case, the choice procedures should be carefully overseen so as to limit the gaps produced. In addition to use the huge measure of heterogeneous information in unstructured content, sound and groups of videos (structure is 95 percent of vast information), creating legitimate and productive systematic strategies is essential. Additionally, using new devices to perform prescient investigations for organized huge information is important with this.

6. CONCLUSION AND FUTURE SCOPE

From the perspective of business intelligence, this paper presented several challenges related to big data. In addition, we also presented some critical big data characteristics and suggested the various ways to improve business intelligence. This paper also describes, apart from the characteristics and challenges of big data, the Big Data Analytics Service Oriented Architecture (BASOA) and the various layers and operations associated with it. This paper will assist the researchers to understand the concept of big data from business intelligence point of view and help them to design and build novel business big data based analytical models for the analytics of business selected data. This paper also discussed big data architecture in order to assist in enhancing the business intelligence. In this paper the proposed approach are developments of business intelligence, analytics of big data, business analytics and e-commerce.

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