Comparative Analysis of Big Data Analytics and IoT Technologies

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Abstract*— Currently various devices are able to connect with internet, so the vast amount of data is created. The BDA (Big Data Analytics) and IoT (Internet of Things) Technologies are two diverse concepts that handles data from different perceptive. As for Big data Analytics the data are obtained based on human generated while IoT the data is from machine generated. Numerous researches are carried on both these areas. This present clear gives idea about these two areas in basic and later in detail. Big data Analytics are used for making long term decision while IoT are for short term decision for real time purpose. Also, the paper focuses in comparative analysis of both areas based on wide varied parameter where each one proof to be have some advantage and disadvantages. After detail comparison final, it concludes that each domain can be selected as per the scope of application.

***Index Terms*— BDA, IoT.**

I. PROLOGUE

The BDA and IoT Technologies are two diverse concepts that handle data from different perceptive. As for BDA the data is obtained based on human generated while IoT the data is from machine generated. These technologies are varied based on their application it is foremost important to understand the fundamental concepts of them. Both this technologies handles data for making decision. Now this paper introduces the basic of BDA and IoT.

A. BDA

The massive dataset is known as big data that are collected from different sources such as internal, external, archived and production data of an organization for making strategic decision by revealing the insight of data on analysing hidden information can be defined as BDA. It analyzes large volume of data that could range from Peta Byte or more.

B. IoT

Nowadays there is a highly requirement of developing applications. So IoT is important technology using which we can create various useful internet applications. As their increase in the utilization IoT technologies there is a lot of data collection are happening based on real time scenarios. IoT is a massive system of connected devices all of which collect and distribute data about how they are used and the environments in which they are operated.

II. OUTLINE OF BDA AND IOT TECHNOLOGIES

From different perspective BDA and IoT technologies are elaborated as below.

A. BDA

It includes various operations for probing the databases, extracting and analysing data so as to enhance the performance of an organization [1]. It is the method that investigates huge datasets that contain a various data types [2] to expose new features, market strategies and correlation pattern of data that can be used for business perspectives [3]. The ability to analyse bulky amounts of data can help an organization to place this metadata in to useful information that can affect the business [4]. Hence with the help of it the organizations will be able to improve the understanding of data so as to make better and correct decision. It allows data analysts and experts to observe a large volume of data without hampering conventional tools [3].

Received: 14 June 2019/Accepted 11 July 2019.

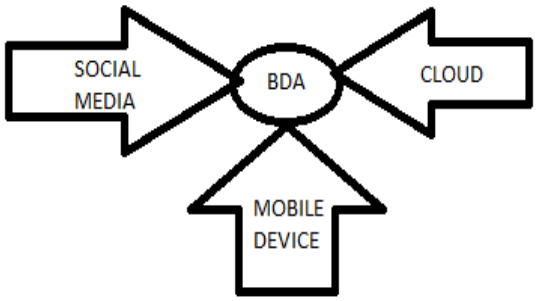

Fig 1. Sources for BDA

The Fig 1 depicts the various inputs of data for BDA that can be used for making analysis and decision making in an organization.

B. IoT

It provides a policy for sensors and devices to communicate flawlessly within a smart environment and enables information contribution across platforms in a suitable manner. The recent edition of different wireless technologies places IoT as the next innovatory technology by benefiting from the full opportunities offered by the web technology. It has observe its modern acceptance in smart cities with interest in developing intelligent systems, such as smart energy, intelligent retail, etc[5], [6].Some of the areas identified as an enablers of the IOT are sensors, Nanotechnology, Smart Networks and RFID (Radio Frequency identification). IoT could be renowned in three domains: web, sensors, and RFID [7].

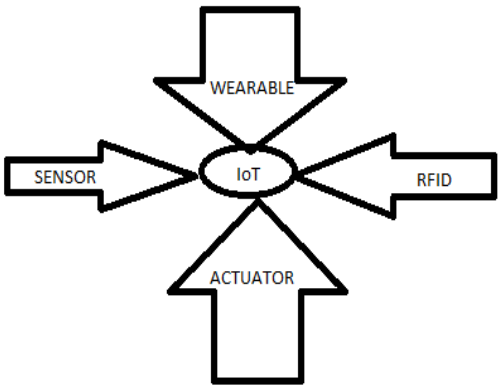

Fig 2. Inputs for IoT

The Fig 2 describes different sources of data for IoT that can be used for making conclusion on real time.

III. COMPARISON OF BDA AND IOT TECHNOLOGIES

The BDA and IoT can be compared based on various parameters like facts, data generation, data sources, volume, velocity, Data Type, Techniques to implement, Pre-Processing, Hardware Cost, Reliability, Security, Privacy, Users, Application and Benefits.

Sr. No.	Parameter	BDA	IoT
1	Facts	Massive dataset	To make everyday things intelligent
2	Data Generated	Human Generated	Machine Generated
3	Data Sources	Mobile computing, cloud computing, social networks	Sensors, actuators, wearable's, media, location, RFID
4	Data Type	Unstructured data e.g. Mongo DB-NoSQL as well as structured and semi structured	Structured because format is pre-defined
5	Data Volume	Large volume of data e.g. PB or more as per high end data server's capacity	Small Real time data are collected according to sensors capacity
6	Data Velocity	Data is generated on routine basis	Data is generated continuously e.g. Every millisecond
7	Techniques to implement	Apache Hadoop, Cloudera, GFS, Big table, R Studio	Raspberry Pi, Arduino, Cloud services- AWS
8	Pre-Processing	Yes- Not separate but built-in the ecosystem.	No
9	Hardware Cost	More as high end servers are involved	Less as sensors and microcontrollers are involved
10	Reliability	Reliable on Data security, Server Security and network security.	More reliable on cyber security, communication, shared responsibility and use
11	Security	Security Model is disabled by	Afterthought (Biggest concern)

Received: 14 June 2019/Accepted 11 July 2019.

		default need to enable explicitly.	
12	Privacy	It can be maintained within organization.	It is not maintained
13	Users	BDA-Executives, Analyst., Managers.	Normal human beings
14	Application	Enterprises, Research & development, education, retail, E-commerce	Health care, Transportation, building and home automation
15	Use cases	Determine equipment condition, Identify production capacity and Coverage for the loss[8]	Process Reduction, Illegal Identification and advertising inventory [8]
16	Benefits	Help to make strategic decision for bossiness purpose	Minimize human effort, save time, efficient resource utilization

Table I: Comparison of BDA and IoT Technologies

The above Table I elaborate that both the technologies can be utilized properly as per the application or the problem scenarios better suitable for. BDA as the name suggest it handle large volume of data like PB or more we can use this technology along with IoT when there is a need to store such a volume of data for making real time result or decision whereas when real time scenario is not needed in that case we can work with traditional BDA for making decision for better business in any organization.

IV. CONCLUSION

BDA and IoT are two diverse technologies which handles data from different perspectives like BDA store a large volume of data and then analysis it for strategies decision which is long term decision while IoT store relatively small volume data and use it to make real time decision which is short term decision for immediate reaction purpose. This paper clearly elaborate that both are diverging and upcoming technologies that provides various opportunities for application under different domains..In future a large scope of opportunities are available in both this technologies and it also throws an opportunities to develop a hybrid approaches to access both of its advantages.

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Received: 14 June 2019/Accepted 11 July 2019.