Real World Applications of Big Data

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Abstract—we are overflowing in an overflow of large data today. In expansive variety of applications areas, data is being collected from at different scales. Nowadays, every aspect of modern society is impacted by big data involving medical health care, social networking, government sector, bioinformatics, education system etc. this leads to new research paradigms. With this new era of big data, the traditional methods for analyzing data is no longer exist. This paper summaries the latest applications of big data & its associated future scopes.

Keywords—Big data, 5V's of big data, classification, social networking, medical health care, government sectors, commercial websites, geospatial devices, bioinformatics, education system.

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1. INTRODUCTION

We are entering into "BIG DATA" era with large sources, complex & growing data initiated by many distinct sources. Nowadays, modern society is influenced by big data & its applications which include medical health care, government, social networking, and network securities etc. Big data gives a new paradigms& giving a path for development [1]. The data volumes are increasing rapidly therefore processing such huge amount of data is going to be difficult. Big data is defined by five V's. i.e. Velocity, volume, variety, value &veracity [2]. The Big data appears to be a new power that changes everything that interact with it. So it is considered to be the new weapon for 21st century. In every second, 2.8 million emails are sent, about 20 hours of video is uploaded in every minute and about 50 million tweets are generated per day. So it is predicted that around 2020, the size of the data universe will reach 44 zettabytes, or 44 trillion gigabytes [3]. MapReduce & Hadoop are the two technologies used to manage all of the data which is unorganized in a single place & give fast results to the users.

This paper has revealed the definition of big data &many applications of big data as well as challenges of big data in different fields & its future scopes.

2. BIG DATA CONCEPT

2.1 Definition Of big data

Big data refers to the large volume of data that requires advance technologies for its processing [4].

2.2 5 V's of big data

1. Volume- it is the size of data which describes the value of the data.
2. Variety- this means that the category to which big data belongs to.
3. Velocity- it refers to the speed of generation of data & how fast data is generated & processed.
4. Veracity- It refers to inconsistency which can be shown by the big data.
5. Value- It refers to the creation of hidden information & patterns by data analysis in big data.
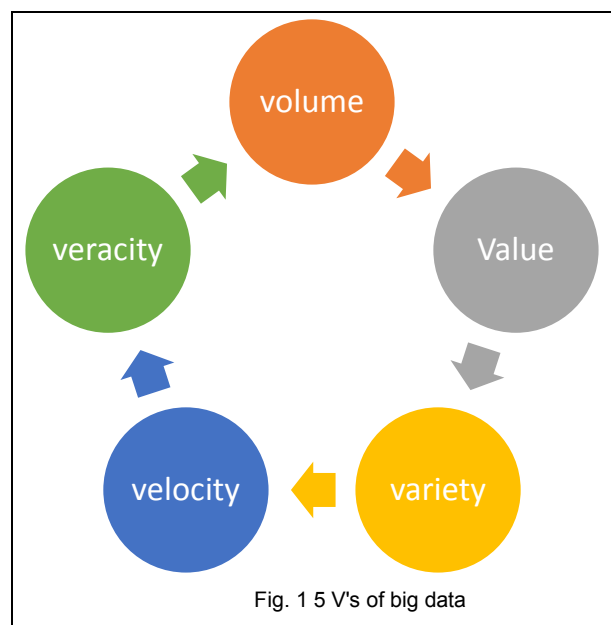

Fig. 1 5 V's of big data

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2.3 Classifications of big data [6]

Big data is classified into different categories just to understand their characteristics & due to large scale data in the cloud.


Fig. 2 Classification of big data
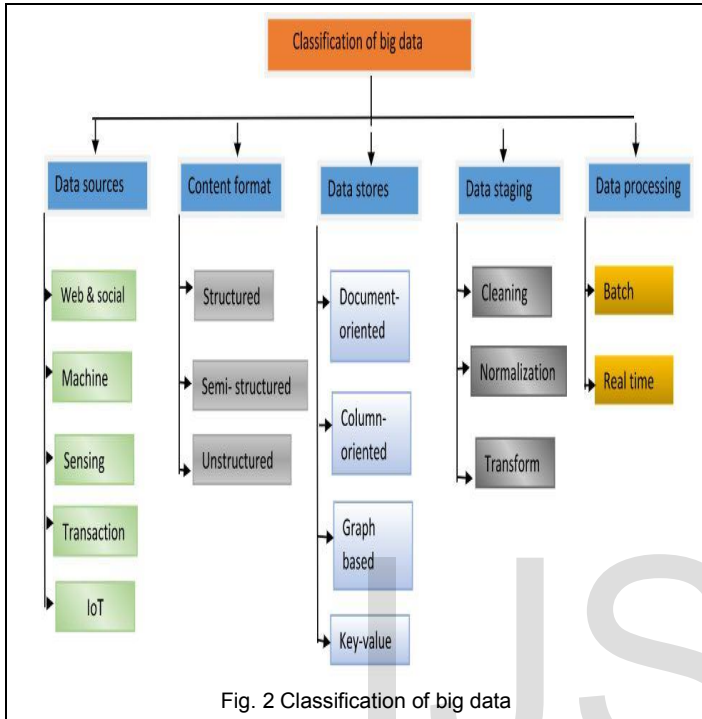
3. APPLICATION PART OF BIG DATA

3.1 Social networking

These days many of the people are spending most of their time on social networking sites like Facebook, Instagram, twitter, LinkedIn, google+, Snapchat etc. even the employers are used to check their employees through an examination of their social networking profiles[7].Hence there is a need to maintain the details of these applications that are having unstructured data so the traditional database are inefficient in making a database of all this sites and then the concept of big data comes in existence and make a change in the world of connectivity. Now every person can contact to any other by using simple application which also provide fun for them. People are sharing their views and also upload their images and videos [8].Big data make a detailed information for these application it have the capacity to make a record to each and every type of data that is done by the user and also it archive the data of past years when the user starts using that social site and if the user wants to see what he done in past few years then he can simply see the history and get the data which is a great achievement in the field of data handling [9].

3.1.1 Recommendations & Future scope

Organization lacks in controlling the mechanism of SNS phishing risks [10], enhancing privacy settings & cookies against malware, personal security, and authentication mechanism, internal protection mechanism that protect & detect spams [7].


Fig. 3 Applications in social networking
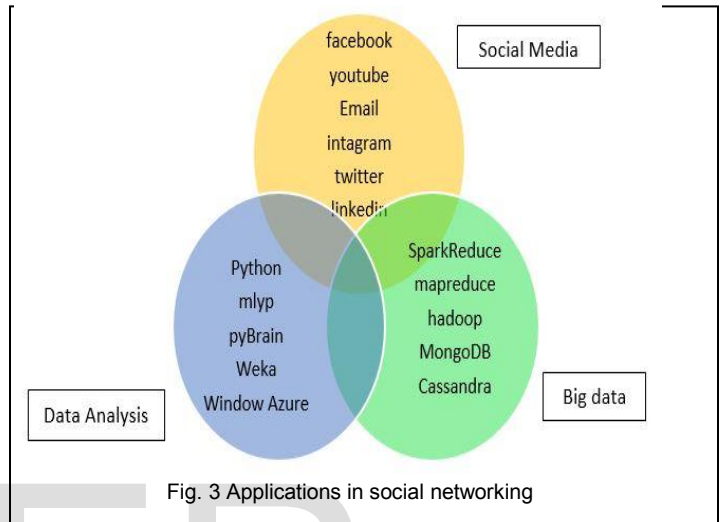
3.2 Medical Health Care

One of the leading industries that generates Zettabytes of data every data is 'Medical Healthcare' in which 80% of its data is in unstructured form & relevant. Traditionally data is stored in hard copies while now a day's it is becoming digitized industry from multiple sources, as: patient behavior and sentiment data, pharmaceutical and R&D data, healthcare data on the web, claim, clinical data Cost & Administrative data, and streamed Data [11]. The impact of Big Data is based on the five new pathways in the healthcare: right living, right care, right provider, right value, and right innovation [12].

3.2.1 Recommendations & Future scope

Evolution from human based healthcare system to an increasing automated data driven approach is unavoidable [14]. So there are issues such as guaranteeing privacy, establishing governance& standard, safeguard security, & continuous improving the tools & technologies will be the collected attentions [13].

Fig.4 Applications in medical health care
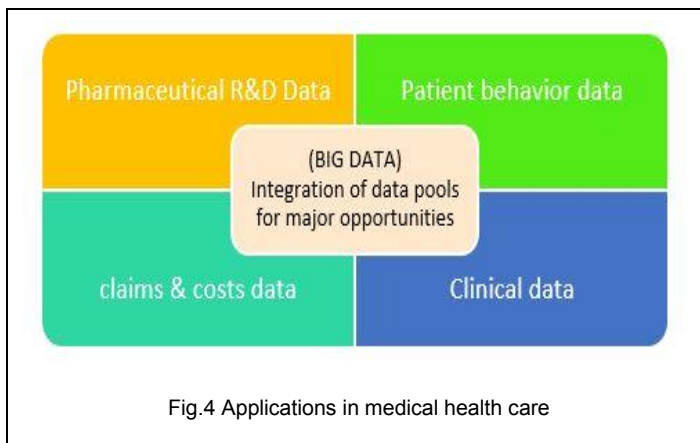
3.3 Government Sector

In last five years all the work is maintained on the hard copies by their employees. But the main disadvantage is that it takes a lot of time and also the different department have to make their records and also need to maintain them [15]. When the traditional based system fails in keeping the huge records then big data comes into existence that provides a way to make a large database that have the capacity to maintain a record of the past information and also ready to store daily updates of each department. Now the salaries records are available and all of the details of every program launch by the government, jobs details, and details of all of the political parties and their work of every year. Now government makes their soft copy and uploads it online and anyone can know about their rights easily.

3.3.1 Recommendations & Future scope

The main concern with big data applications in government sector is on security, speed, interoperability, analytics capabilities & lack of competent professionals. Big data need not to only translation technologies but an international collaborative effort to share & integrated data [15].

Fig. 5 Applications in government sectors
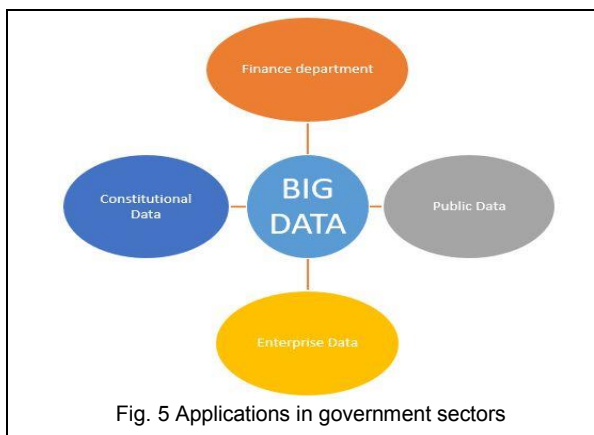
3.4 Commercial websites

Online shopping is in trend where people used to sale & buy products online by using various applications like flipkart, Amazon, Snapdeal etc. that provides various facilities like cash on delivery, credit\debit card payment, easy exchange & return processes. All this provides the ease for the user by easily searching the products & buy them. Big data and online shopping is having a great collaboration between them. [16][17].

3.4.1 Recommendations & Future scope

The e-commerce model based on big data has the ability of enhancing the value chain management of e-stores, optimize marketing activities and increase sales via analysis of consumer behavior, payments, deliveries and competitors. A more accurate assessment of the quantifiable benefits of the E-commerce model requires processing of empirical data and will be the subject of future research [18].

Fig. 6 Applications in commercial websites
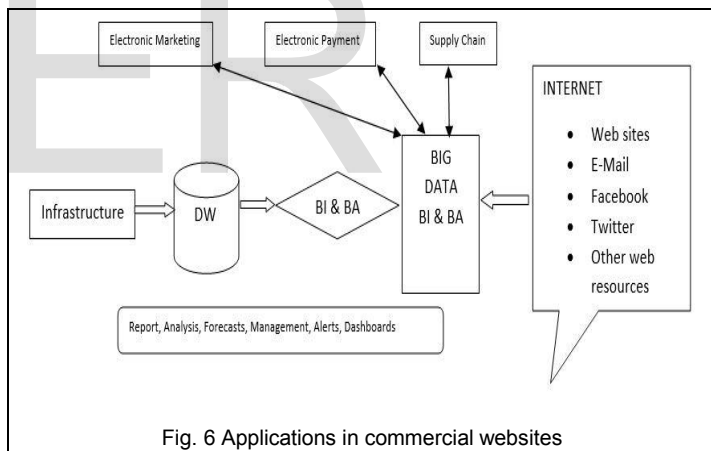
3.5 Geospatial devices

It refers to the spatial data sets exceeding capacity of current computing system [19]. In space there are many activities are going on every time our planet earth is always surrounded with meteor and meteoroids and some of are so big enough to destroy the earth hence the satellites are always in monitoring the earth so that the scientist and astronauts take desired action if any problem is come. Today a single TV program is seen by many people on a same time hence the need of broadcasting the programs to the entire users in a same time is necessary so we are using to make a database of the users and make a link to the GSLV and broadcast all of the information in a single time.

3.5.1 Recommendations & Future scope

There should be the development of new spatial indexing and algorithms to handle real-time, streaming data and support topology for real-time analytics. The development of efficient methods to display data integrated in the three dimensions of geographic. The development of conceptual and methodological approaches to move big data from descriptive and correlation research and applications to ones that explore casual and explanatory relationships. Privacy and security are equally important and key concerns especially in geospatial big data handling [20].

Fig. 7 Application in geospatial devices
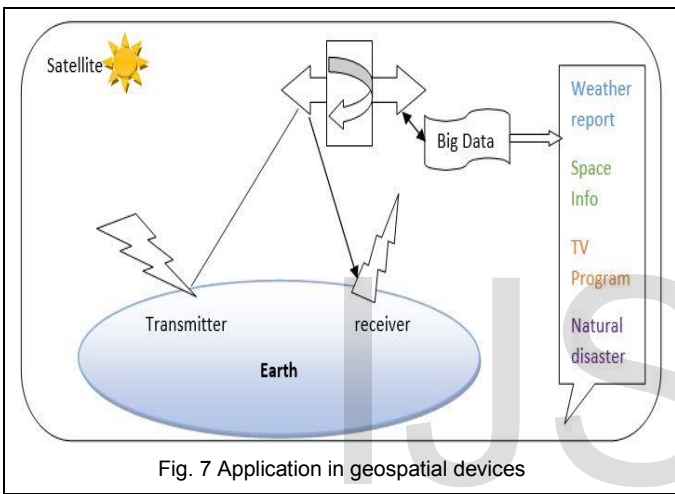
3.6 Bioinformatics

It may be defined as the science of collecting & analyzing complex biological data such as genetic codes. So it requires a massive amount of database as every single person & their genetic info differ from each other. Therefore big data is used to maintain the database to store this kind of information.

We are using advanced bioinformatics technologies like face reorganization, finger print reorganization & eyes reorganization in high security [21]. It allows us to obtain & store large quantities of data that should be processed [22].

3.6.1 Recommendations & Future scope

Big data brings considerable challenges to bioinformatics like storage demand of big data, data transfer, security & privacy, deriving values, heterogeneity , time & space constrains & visualization &presentation of big data [22].

3.7 Education System

The use of big data & analytics in education system is relatively a new area. Big data provide many opportunities Advantages in education system [23]

Table 1 Education system data table

Improved instruction	It Can improve students' performance and learning abilities making the lessons more personal.
Matching students to programs	Open Data are able to help students and parents to find the best school or educational program
Matching students to employment	Students, employees & companies can find their applications for job that matches their abilities.
Transparent education financing	It able to choose anything about higher education and to discover the proper education programs for them
Efficient system administration	This helps in securing a high performance, add afford to a versatile and successful plan for future education interests.

3.7.1 Recommendations & Future scope

The traditional view of education system would be changed leading to a new relationship between knowledge & skills. Analytics would lead sustainable & disruptive innovation in academic field [24].

Fig. 8 Applications in education field
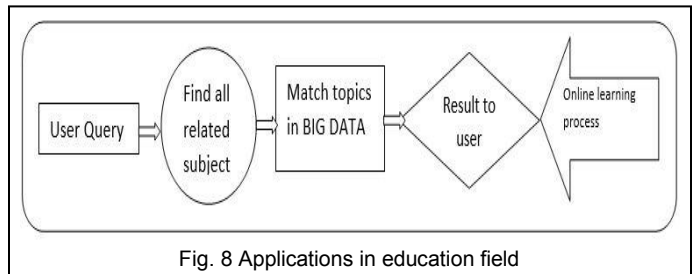
3.8 Security of network

Big data give a big change in security technologies. The most important use of big data in monitoring the network, and always try to identify that the personal information of the users always be safe from the unauthorized persons

and also try to prevent the external user from users data [25]. Large industries always wishes to safe their activities from the external users hence in this way they form cloud of their personal data because security technique are easily applied on clouds, this helps in identifying the unauthorized access of data or the fraud persons.

3.8.1 Recommendations & Future scope

As far as security is concerned, the existing technologies are promising to evolve as newer vulnerabilities to big data arise and the need for securing them increases [26].

4. FUTURE SCOPE

Big data has the potential to change the world in every field. Big data isn't new but now has reached critical mass as people are making their lives digitize. The new applications are generating a huge amount of data in unstructured and structured form. Big data is able to process and store that data and probably in more amounts in near future. So, we will need new technologies and tools for anonymizing data, analysis, tracking and auditing information, sharing and managing, our own personal data in future.

5. CONCLUSION

Big data have the ability to handle all type of unstructured, semi structured, structured data in a single place and also easy to understand by the front end users the Hadoop and map reduce methods is the main methods to handle the applications database the all of the fields which are describe in this paper are having a unorganized database so that big data plays a very important role to manage all of the data in a single place. Medical, sports, academics, telecommunications, government sectors and all of other those are discussed in this paper have a definite big data analytics platform so that these application works fast with all of its complexity. The main aim of this paper is make list of all applications of big data is used and to give a future assumption about the problem of size when the size of data increases and we have to store that massive amount of data by using some new tools and technologies like Hadoop, MapReduce, HPCC, HIVE and some new are coming in future.

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