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A Systematic Review on Big Data Challenges, Opportunities and Realities

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Abstract:
Over the last decade there has been excellent amount of data generated because of internet of thing and web technologies. Facing the development of future technology, the emerging technologies such as big data, changes in technology , tool and managing of big data are discussed.The issues of Relational data base management system (RDBMS) can be infuse by big data due to advancement of technology.

New technologies have been developed like big data to derive useful perception and to overcome the existing technologies which have many limitations to handle big data. This paper is encapsulation of big data analytics, its applications, limitations and advantages. Research issues and future direction are manifest in this paper

Keywords: *Big data, Big data analytics, Data value chain, Cloud computing, Hadoop ,Grid computing, Mapreduce*

INTRODUCTION

Due to growth of digital world the production of data from heterogeneous sources and smarttransmission had direct to development of big information. This big information is known as big data. The difficulty level in our traditional data base management are increased day by day due to growth of digital technology, so the word "Big Data" was first established to the computing world by Roger Magoulas in 2005 .Using big data we can easily manage and process the big amount of data which are not in traditional data base . Some scholars argues that "big data is new business and social science frontier" and the load of information and knowledge that can be produced from the digital universe continued to expand swiftly. Big data has important problem and challenges that would require coordinated research effort. We arrive at a judgment that these major challenges had to be addressed within the next decade. our aim to study big data is to understand the big data challenges that matter the most to scholars and update our findings to provide new perceptions into the future direction of research in big data analytics.

From the study, we examines the market for digital transformation professional services, which is forecast to grow rapidly, by 12%,

Fig.1:Sources of Big Data

Figure 1 shows the different origin from where the data is collected.In the last of 2000,the handling ability appearance of social media and cloud computing helped to the rise of big data as the end of 2018, it boasted over 2.32 billion monthly active user, Face book has an average of 1.32 billion daily

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active users,5.11 billion unique mobile active users,available in 101 languages,155 billion friend connections,250 billion photos uploaded everyday 32 billion piece of content,2.9 billion likes, and comments are being posted and 130 average number of friends per Facebook user.This has generated new pathway to study social and cultural dynamics.

The abstraction of big data from origin to depth is given in this paper. The beginning of the term 'Big Data 'is used due to fact that we are originating a vast amount of data every day. In this paper we discuss the restriction of traditional data base and demand of big data , evolution of new technique for accumulate and managing of big data instruct. Big Data is a contrasting of both semi structured, unstructured and structured data. This section giveguidence to open questions for further research and restrictions of big data analytics.

BIG DATA SECURITY ANALYTICS AND DEMAND

It is a very big challenge to store and recuperation of enormous size of organize and unorganized information at a expedient time .our traditional data base system also does nothold large sets of data and does not maintain security issues. It's a very challenging task to ensure the security to these excessive data. The big data also boots up the performance of the system and remove all yhe inquires related to security also. But now a days due to involvement of digital techniques, internet and social media dispersion of information is increasing day by day and these information are both organized and unorganized. Many of those obstructions how to lift and operate enormous size of data with the normal storage technique convoy to the exposure of the term Big Data.Data gathered from different areas become not secure for research. Big data makes it possible and all problems related to security processing and handling of enormous size of data. Big data security analytics handle all issues swiftly and efficiently.

Presently main focus of big data analysis is to inspect existing technologies such as rule based system, decision trees, pattern mining and other data mining technologies to develop business rules also on large data sets systematically. This can be accomplished by either use of cluster computing for parallel computation or by using advanced algorithms that uses distributed data storage in memory computation. in recent times cloud computing overtakes the processes which were preliminary carried out using grid computing.

Big Data

Big Data analyse allocated value to those unappropriate discarded data of big data analytics BDA[2].In the various areas of research the big data analytics has gradually consolidated its dominance. The process of objective analysis on large quantive analysis on large quantity of data is called big data analytics. Big data security analytics(BDSA) is a result of fusion of big data analytics and big data security.The large quantity of data with diversity of data sets which blow up at exponential rate is Big data.

The big data prototype has appeared because the traditional data base system cannot handle huge data sets. The enormous sized datasets are very disconcert to manage store and process[3]. Various data types are merged together to form big data. As a outcome the data storerooms are more unshielded to security breach. structured, semi structured and unstructured data are the three key data types. Most of type are unstructured type of data.

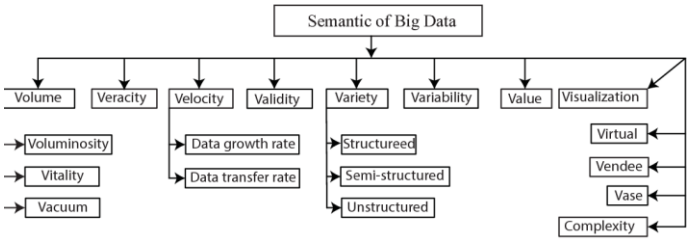

Fig. 2: Semantic of Big Data. Source [3]

TABLE 1: Individual meaning the V family

Name	Short meaning	Big Data context
Volume	Size of data	Voluminosity, Vacuum and Vitality
Velocity	Speed	Transfer rate & Growth rate of data
Variety	Numerous types of data	Structured, unstructured and semi-structured
Veracity	Accuracy and truthfulness	Accuracy of Data
Validity	Cogency	Correct Data
Value	Worth	Giving worth to the raw data
Virtual	Nearly actual	Managing large number of data.
Visualization	To be shown	Logically display the large-set of data.
Variability	Change	Change due to time and intention
Vendee	Client management	Client management and fulfilling the client requirements

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Data Operations and formulation module

The processing of unstructured and semi structure data and prepare investigation on these type of data comes under the data formulation module. Data formulation shows the attentions on different storage data base like key/value database management , Database capability, processing capability, storage and management capability, data integration capability. All the tools and data base are given below.

Table 2: summarization of tools and data base

Big data capability	Tools	Feature
1.Key asset	NOSQL Database Amazon Dynamo DB	Key asset is a data storage which is design for data gathering, data collections and data retrieving.
2.Data base Capability	Oracle NoSQL	Dynamic, satisfy ACID operation, fault tolerance
3.Processing capability	Map Reduce	Customize infrastructure, process big amount of data, works in two phase map phase and reduce phase, divide the problem into cluster which is easily manageable
4.Managing capability	Apache Hive	It provides the facility of managing large data Sets and facility of querying also. it is a open source platform.

RESEARCH APPROACHES

The research approaches divide into three categories. First category involve the different applications areas, second

Table 3 Research issues and their infusion.

No.	Issues	Infusion
1	What are the application areas where big data works	The table 6 shows the different application areas of big data.
2	Different tools used by big data security analytics	The table 2 shows the different data base used the different tools.
3	How many paper publish per year.	The table 5show the clear picture of paper publish per year.

Sources of information

For general and broad exposure of the literature, a broad view is necessary. To increase the chance of relevant articles, a set of appropriate databases must be chosen. For this review, the major databases of electronic journals are searched.

1. IEEE XPLORE
2. ACM
3. Science Direct
4. Google scholar

Research election

I have chosen the different electronic data base for this paper like ACM, IEEE Xplore, science direct and Google scholar. I have used the keywords big data analytics, big data challenges and big data security issues for search query and executed the query. The work which is irrelevant to big data security analytics are removed. After executing my search query I got 160 papers. After applying inclusion and exclusion criteria final 75 number of relevant papers were obtained relevant to big data analytics and big data security. Eliminated criteria used which is based on title, abstract and on full text. I have include those papers which are written in English, focused on big data security and analytics, published in scientific journal and conferences, published between 2013-2017.

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Table 4: Different election norms

Sr.No.	E-Assets	RY	Eliminated			Keyword used
			DOT	DOA	DOF	
1	ACM	10	2	2	3	Big Data Security analytics
2	IEEE	21	6	2	8	Security issues in big data and Challenges
3	SCIENCE DIRECT	29	5	9	12	Big Data Analytics
4	GOOGLE SCHOLAR	100	8	10	17	Big Data Analytics and Challenges
RY-Research yield, DOT-Depend on Title, DOA-Depend on Abstract, SOF-Depend on full Text						

Categorization scheme

Classification done on the basis of selected keywords. Keywords with the filter applied to it so that in particular field papers are comes. The selection process resulted in 75 papers selected from four different digital libraries. Each paper is carefully assessed and classified. The selected research papers are classified according to the criteria established in section 3 of this article

Publication peryear

The following table 5 shows the publishing paper on big data security analytics and challenges. The number of papers is rapidly increasing. More papers are published in the 2016 and 2017. These results shows the important guidelines for future research.

Table 5 numbers of paper published from 2013 to 2017

Year / E-Assets	2013	2014	2015	2016	2017
ACM	4	7	6	8	12
IEEE	2	3	8	9	16
Science Direct	5	3	4	6	8
GOOGLE SCHOLAR	9	12	11	15	20

Table 6 Applications Areas of big data analytics

Application Area	Future Work
1.Healthcare	Medical images and records produced electronically helped to develop a powerful treatment system which improve the quality of treatment
2.Telecommunication	Adoption of mobile and mobile services increases rapidly and target marketing also increases. Customer calls and text messages are recorded. These recorded data is used for further analysis and investigation
3.Agriculture	Sensor technology is used which increase the fertility power of soil. For weather forecasting so that farmers are alert.
4.Marketing	Marketing analytics helps to increase the marketing performance. Using big data analytics customers requirements, customer behavior, patterns are analyzed and modified easily
5. Education	Different types of apps are used in schools and institutions .using these apps we can easily monitor the students and performance of each student is recorded and assessment are given by teacher in a easy way so that they can easily apply the remedy procedure.
6.Other sectors	With the advent of technology the big data analytics can be used in constructions and in material sciences also
7. Social Media analytics	Sentiment analysis are used by many company by analyzing customers views so that they can improve their product and their market value[4]

Technological growth and Technological limitations

The big data analytics are executed by many sectors because of its advantages and its applications.The emergence of machine learning, cloud computing, parallel computing, grid computinghave dispose of big data.

Data Scalability: Scalability [5] is a mechanism of handling large amount of data which increases enormously. NoSQL is a platform which provide the facility of retrieving and storing of data.

Data Privacy: Technology like cloud computing arrange a interface to access and capture information for analysis. Due to intellectual property of IT technology great risk of privacy and security.Buying and sales procedure involve sharing of personal information so that privacy preferences increases. But big data scholars confuse in security and satisfaction.

Ethical and social problem: Due to Digitization people share all information on social media. Some rule and regulations are defined so that people can aware and reserve their private information.

Data Analytics system: Traditional data base has some limitations like scalability and not works on unstructured data type and some issues also related to their performance. Now a days it is essential to

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develop such type of system which works on heterogeneous data type and contain the feature of relational data base and non relational data base.

Storage issues: Advent of digital techniques size of data is increasing day by day and traditional system are not capable to store enough data. So it is mandatory to develop a processing system which is capable to store big size of data.

Data perception: Perceptions of data provide better experience. Interpretation of large size of data is not easy so to translate into usual way provide good understanding. Data perception help user in decision making.

Conclusion

During the last decade substantial growth has been observed in data generated. so, for everyone scrutiny of this data is a laborious process. This paper is a general review of big data, procedure imply in big data analysis and considered heterogeneous techniques and tools to exercise big data. i have also make an attempt to analyze various tools for managing big data, various information centers have been emphasized. There are various applications domains where big data can do significant job in upgrading the system have been analyzed. For upgrading of big data for future research the requisite technological advancements, guidance and constraints have been emphasized.

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