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A Study on Challenges of Big Data and Smart Phone

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ABSTRACT: Mobile technology is having a huge impact on our lives and our society – along with changing the way we think about data and use the massive amounts of information generated by that technology. Now a day everything is available on the touch of finger. With this emerging trend digital world accelerated the volume, speed and variety of operations. In the world of mobile computing the real magic is availability of data whenever it is require and capturing of data wherever available. The promise of data driven decision is now being recognized broadly with growing enthusiasm for the notion of Big data. Accessing data from big data and mapping it to limited memory availability of our mobile device is the major challenge. This article is small discussion on different challenges like limited mobile memory for getting access for unlimited data and caching it on our device with lightning fast speed using wireless media and so on. Emerging concept of Big data in the world of mobile can change the way and futures of computing in coming days.

KEYWORDS: Mobile computing, Big data, Caching, Wireless media

I. INTRODUCTION

What is really different about mobile computing? The computers are smaller and bits travel by wireless rather Ethernet. Nothing is impossible from when we got the smart phone. In other words we can say that with the help of this small device we can carry entire world in our pocket. Days are going on and with this rapid development our demands are also increases. Everyone wants more and more data accessed on their devices. On-going research gives us solution in terms of Big data. This paper is attempt to answer the following questions.

- How to cache required data from big data on limited storage capacity which is available on mobile devices?
- How long to keep that data? And so on.

The paper is in three parts: Introduction to Big Data, Overview and importance of mobile computing, and Future aspects of big data in mobile computing.

II. WHAT IS BIG DATA?

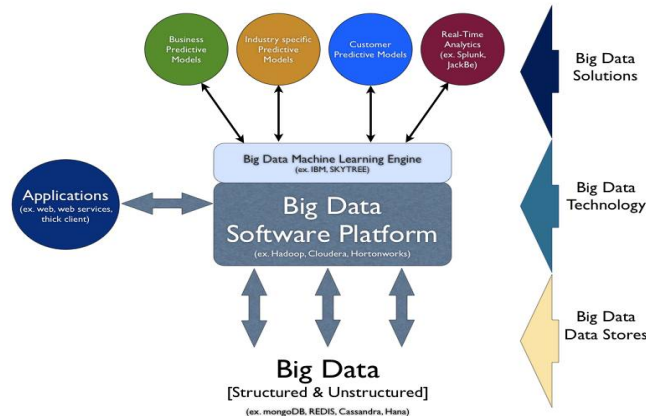
Big data is an evolving term that describes any voluminous amount of structured, semi-structured and unstructured data that has the potential to be mined for information. Big data is a set of techniques and technologies that require new forms of integration to uncover large hidden values from large datasets that are diverse, complex, and of a massive scale.

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There are multiple dimensions to big data, which are encapsulated in the handy set of seven “V”s that follow -

- Volume : considers the amount of data generated and collected.
- Velocity : refers to the speed at which data are analyzed.
- Variety : indicates the diversity of the types of data that are collected.
- Viscosity : measures the resistance to flow of data.
- Variability : measures the unpredictable rate of flow and types.
- Veracity : measures the biases, noise, abnormality, and reliability in datasets.
- Volatility : indicates how long data are valid and should be stored

As "Big Data" describes data sets so large and complex they are impractical to manage with traditional software tools.. The challenges include capture, curation, storage, search, sharing, transfer, analysis and visualization

III. IMPORTANCE OF MOBILE PHONE

In today's world the definition of mobile has been completely changed. Before some years ago this same device was used for communicating with each other. The specialty of this device was peoples were available at any place on any moment. Today the scope of mobiles is not limited for communication but emergence of computing with it is the real invention behind the lightning fast life style of human beings. As the research going on and we are getting very user friendly applications are being developed and the demands of customers are increasing and that's why this is a rich area for research in these days.

In other words Smart phone device is a way of interaction which allows us to be able to connect with outside world for different purpose like banking ,Shopping, Ticket reservation entertainment, share market and so on. The volume of mobile data and the speed at which it is created is only going to increase as both the global population and mobile device penetration rates rise, and the use of social media increases. On the basis of these operations mobile-wireless information systems is classified in: horizontal and vertical applications.

1) Horizontal applications are general, adaptable to a wide range of users and organizations, e.g.: e-mail, browsers, and file transfer applications.

2) Vertical applications are specific to a type of users or organizations, for example: financial applications, such as money transfer, stock exchange and information inquiry; marketing and advertising applications according to the actual user position, i.e., pushing coupons to stores and information about sales nearby; emergency applications to check real-time information from government and medical databases and utility companies applications used by technicians and meter readers.



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IV. BENEFITS OF MOBILE COMPUTING

Recently most of the research have been done in cloud computing as it is the source for dynamic, fast, independent and reliable media for web based applications. Now a day everyone is trying to merge mobile computing in cloud which has following benefits.

- Empowered processing
- Prolonged battery
- Expanded Storage
- Increased data safety
- Ubiquitous data access and content sharing
- Protected offloaded content
- Enriched user interface
- Enhanced application generation

Along with this if we use the concept of big data it will benefit a lot in terms of increased availability of data set as it will provide us access to the data other than the cloud



V. CHALLENGES OF BIG DATA

The real issue is not about acquiring large amounts of data. It's about how to store that data on the limited memory availability of mobile device. It is not possible to efficiently access valuable pieces of data from big data due to limited memory of mobile device, which is having limited memory to store a large data.

Following are some of the challenges which might occur while storing data on mobile memory.

1. Network Availability
2. what if the data volume gets so large and varied and there are no ways to deal with it?
3. Should all the data have to be stored?
4. Should all the data be analysed?
5. How to find out which data points are really significant?

Cache memory is used for storing required data on the network. Now the question arises that

1. How to manage memory for caching the data?
2. How to maintain speed when lots of data has been stored in cache memory?
3. How to manage continuous energy resources?
4. How to manage heterogeneous data i.e. structured and unstructured data.
5. And also managing simplicity, Security and privacy.

Techniques to overcome the challenges

1) Use of Caching:-Whenever our device gets connected with network all the downloaded data get stored directly on local memory and hence it requires larger local memory. Because of this it requires large internal memory for mobile



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device. So instead of using this local internal memory for storing preliminary operations such as contacts, messages, games etc. if it is possible to store all these on Memory card and managed by internal memory then it will benefit a lot as like.

- Fast processing speed
- Ease of use of memory
- Remarkable fast speed of preliminary operation as well
- User friendly applications etc.
- Also possible to transfer phone data form one handset to another one very easily, as it faces problems now days with micro SIM cards.

2)Use of Replication:-In the distributed systems, Replicas have been used for the fault tolerance on the other side it generates the network traffic .This again reduces the Processing speed. In practical it is not possible to avoid use of replica but it is possible to keep track on maximum number of it so that it gets the remarkable slow speed and also tolerate the faults arises.

3) Use of Compression: - On web, there two types of data, first is structured data and second is unstructured data. It is needs to use effective techniques for compressing structured data. But real problem is with unstructured data. It is required to use proper techniques to compress the unstructured data then it will be very much beneficial .

Future Enhancement of Big Data in Mobile Computing

Concept of big data is very much useful in mobile computing. Practically these enhancements are very difficult to implement, because it requires different types of advanced features to be implemented. As per the need of user our mobile phone must manage to acquire these different architectures in ad-hoc manner which really can change the human life indifferent ways such as-

- Life style will be very fast as compared to today.
- Limitation of hardware resources such as processor, memory etc. to somewhat extent it causes mobile computing to lack behind which should be dealt when we try to work on these challenges
- With this enhancement it would be possible to work while travelling on our mobile phones such as preparing presentations, working on spreadsheets etc. as mobile is very much popular handheld device.

VI. CONCLUSION AND FUTURE WORK

In this era of smart computing and smart mobile applications we can really change face human lifestyle with the mobiles. It would be very much beneficial in all the domains like academia, industry, banking and so on. This will be very beneficial for all. People will use mobile devices for computing as well as for secure communication and processing. Here are, however, significant privacy, security and data governance challenges and risks associated with mobile devices and Big Data.

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