

Challenges of 5G and Use of Big Data in current world

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ABSTRACT

Now a days, world is witnessing a huge flood of data due to ever growing heterogeneous traffic, mobile network subscribers and online services. This trend is evolving continuously at a rapid pace and diversely in the form of big data. Wide range of use-cases scenarios with diverse requirements brings huge challenges for 5G. One of the most important requirements for use cases is high scalability, connectivity with low latency and high data rate with optimal energy, are equally important in 5G. Big data analytics is required to process this huge amount of raw data and extract small sized and useful information.

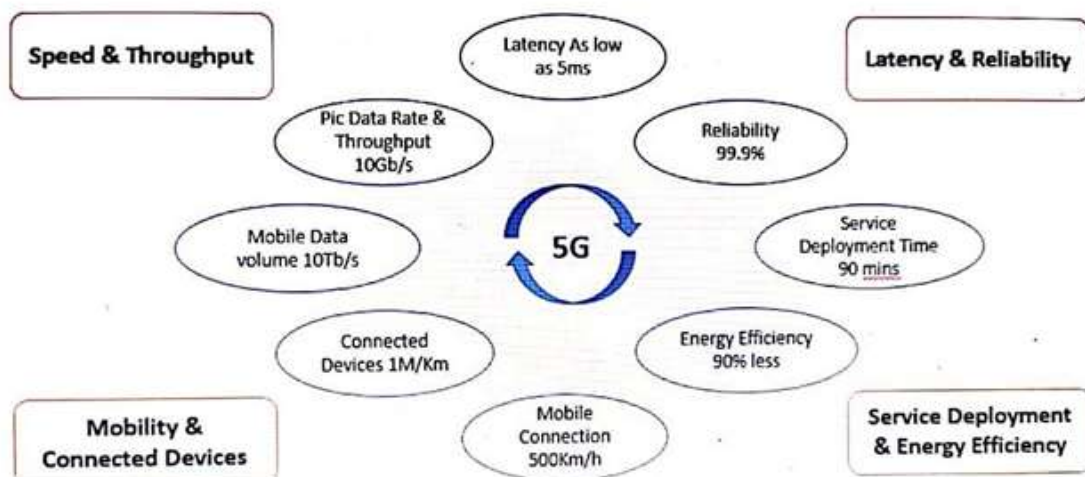
The paper presents challenges of 5G technical scenarios, big data perspective and emerging technologies of Big Data for 5G required for 5G

Research and Development. This paper also provides a detailed overview of big data challenges, imminent in achieving 5G goals.

INTRODUCTION-

5G-5G is the fifth generation wireless mobile network, and its main purpose is connecting individuals, devices and machines. 5G means a mobile internet connection that's just as good as the one at home, no issues using the internet in very crowded places like arenas and stadiums. Yet the implications are far wider reaching the increased number of possible connections paves the way for the next level in Big Data development, eventually leading to smart cities.

FEATURES OF 5G-



BIG DATA- Big Data refers to large data sets whose size is growing at enormous speed making it difficult to handle and manage them using the traditional techniques and software tools. It is a step forward from traditional data analysis, considering the following aspects:

1. Quantity of data (volume).
2. Different types of semi-structured and unstructured data (variety).
3. The rate with which data is changing or how often it is created (velocity)
4. The importance of results extracted from data (value).

As 5G has been launched in some of the metro cities, we see that the number of connected devices increased by 10-100, so it can be concluded that Big Data techniques are playing an important role in increasing the efficiency of 5G data, as all the considered usage scenarios are based

on extracting knowledge from the enormous amount of heterogeneous data generated by connected devices in order to support the mechanisms in 5G networks.

Big data analyses quite clearly deliver big benefits to companies already using them today. The study highlights how Big Data is transforming the existing computing architectures and network traffic in collaboration with a spectrum of rising new technologies, including AI, communication technologies, deep learning and 5G. The research also analyses how Big Data brings computing closer to end users/devices so that businesses requiring real-time data do not suffer latency issues.

The following chart shows the different departments where companies are using, or planning to use, big data analytics.



5G-Technology Challenges

1. DATA DENSITY-

- Multi-tenancy service-oriented environment.
- Extraordinary increases performance expectations.
- Management of cache size.
- Congestion due to huge data.

2. TRAFFIC DIVERSITY-

- Diverse Requirements.
- Performance degradation of path heterogeneity

3. CONNECTION DENSITY-

- Low power massive connections.
 - Congestion due to massive connectivity High capacity hotspot
- #### 4. HETEROGENEOUS SOURCES –
- Heterogeneous resources for different slices.
 - Diversified Key Performance Indicators (KPI).
- #### 5. ULTRA-LOW LATENCY-
- Caching redundancy and intra cache communication.
 - QoS requirements are time bounded.
 - Wireless multimedia services are time-sensitive.

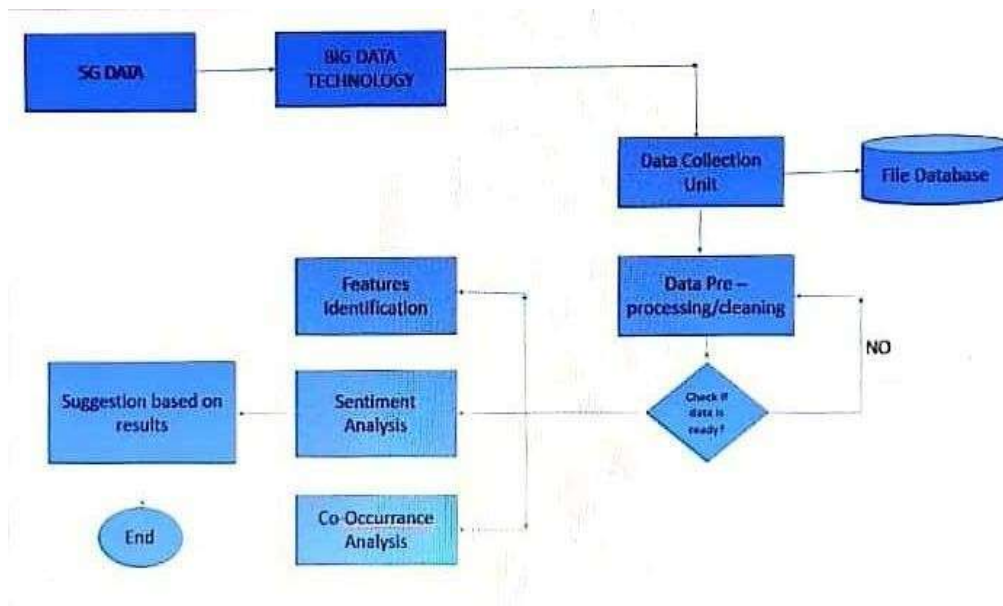
An Intersection Between Big Data and 5G-

As big data deals with extremely large data sets, making connections much faster and more reliable will increase capabilities enormously. Nowadays, Today's generation is using a lot of data. Large sets of data is required for using many Devices.

There is so much data out there today that no one can possibly process it all. For example, many companies have the data that can tell them

how their customers actually feel, and when and why those customers might switch to a competitor. The problem is that most companies do not know what they don't know. Data transfer is one of the most pressing problems for companies in the telecom industry today. As data requirements grow from month to month, cost for dealing the mass also goes extremely high.

Fortunately, Big Data Technology will save the day for those who are savvy enough to use it cleverly.



5G AND BIG DATA FLOWCHART

HOW 5G AND BIG DATA WORK TOGETHER?

So how might an operator deploy and use Big Data as part of 5G? Let's sketch out the basic outline here. First, it should be no great epiphany to observe that all operators are steadily migrating to so-called programmable networks enabled by NFV and SDN. This general purpose scalable fabric upon which 5G will be built can provide the compute and storage capacity to run the Big Data databases and analysis (e.g. Hadoop). This may be for the operator's own network operation purposes or provided as a service to some IoT application that requests the 5G operator to do some critical Big Data processing on its behalf.

When required, the operators will even be able to do Big Data analysis at the edge of the network as envisioned in the Mobile Edge Computing (MEC) model. This will allow filtering and local processing near the source of the data. Another source of unstructured data for 5G will be through the large amount of video data expected to

stream through the enhanced network can automatically detect a trending viral video then it may decide to dynamically bring on line more virtual network resources before the peak viewing period of the viral video and thus avoid network congestion.

As you process 5G Data using some of the Big Data technologies like Apache Hadoop, Apache Spark and Hive the data get collected in a Data collection unit that is a database, then 5G Data is further processed and validation is done to check whether the unused data is cleaned or not, if not cleaned the data is further gone for pre-processing and again validation is done, When the data is fully cleaned then the 5G data is ready to move in a further process where the data analysis is done and you will get the desired results.