INTRODUCTION

1. Smart Cities

The concept of 'smart' and 'sustainable' city varies between cities across the world. There cannot be a single definition that encompasses all the attributes in it. Requirements of different cities may depend on local factors and objectives. Academics and practitioners are realizing increasingly that the smart city is a multidimensional concept with many different components and elements, but the idea of smart cities is based on the creation and connection of human capital, social capital and ICT infrastructure to generate greater and more sustainable development of economy and a better quality of life. It is not the technology provider offering solutions will be making it smart, but the integration of solutions, demonstrating interoperability and cohesion between systems within a city in full partnership between the parties involved will contribute to make a city smart. Around the world there are examples of emerging smart cities and many countries have developed plans for them.

In the smart city it is expected that the strategic use of ICT produces more smarter citizens, workers and civil servants which in turn can enact smarter policies and programs, produce better products, conducive to the indigenous business and attracting investment. A smart city is therefore one that uses e-government, publishes open data and promotes an open economy, creates dashboards focused on citizens on the performance of the city, encourages citizen participation in reporting problems and planning, allows testing urban stratification (in which businesses can trial new technologies to improve urban services), nurtures start-up companies and acceleration programs, promotes the use of ICT in education programs, and actively leverages technologies to create new synergies. There is need for consensus between the city administration, consulting firms, service companies and technology companies regarding the ICT components that are needed and how cities should approach this agenda.

Despite variations in the city visions intelligent and deployments, each is connected through an expectation that technologies based network data can be used to reconfigure how aspects of daily life can be made better and addressing urban issues.
1) Smart economy by encouraging entrepreneurship, innovation, productivity and competitiveness.

2) Smart government by allowing new forms of e-government, new modes of operational governance, improved models and simulations to guide future development, decision-making based on information, better service, and making a government is more accountable, transparent and participatory.

3) Smart mobility by creating smart transport systems and efficient multimodal and interoperable public transport.

4) Smart environments to promote sustainability and flexibility and the development of green energy.

5) Smart living by improving the quality of life, growing safety and security, and risk minimization.

6) Smart people by creating and fostering creativity, inclusion, empowerment and citizenship participation.

2. **Big Data**

   The term "Big Data" was first introduced to the world of computing by Roger Magoulas of O'Reilly Media in 2005 to define a large amount of data that traditional data management techniques can not handle and process due to the complexity and size of these data.

   A study on the evolution of big data as a subject of scientific research shows that the term "Big Data" was present in research since 1970, but was related with size of data, but it has gained traction nowadays because of the new data analytics techniques that have been developed to manage and process, so it has been included in publications in 2008. Today the concept of Big Data is treated from different points of view covering their implications in many fields.

   Big data is a term that describes the evolution of any voluminous amount of structured data, semi-structured and unstructured that has the potential to be exploited for information.

   The 3Vs defining the Big Data is large variety, velocity and volume.
1) Volume: There has been an exponential growth in the volume of data being processed. The data is not only in the form of text data, but also in the form of videos, music and large image files. The data is now stored in terabytes and even in petabytes different companies. With the growth of the database, we need to re-evaluate the architecture and applications built to handle the data.

2) Velocity: The data is streaming at an unprecedented rate and must be treated in a timely manner. RFID tags, sensors and smart meters are driving the need to deal with floods of data in near real time. React quickly enough to meet the data rate is a challenge for most organizations.

3) Variety: Today, the data comes in all sorts of formats. Structured numerical data in traditional databases. The information generated from the line of business applications. unstructured text documents, email, video, audio, data and ticker financial transactions. We must find a way to govern, merge and management of these various forms of data.

There are two other parameters defining Big Data. In addition to the increasing speeds and varieties of data, data flows can be very inconsistent incompatible with periodic peaks. Daily, seasonal and event triggered peak data loads can be difficult to manage. Moreover with unstructured data involved.

4) Variability: In addition to the increasing speeds and varieties of data, data flows can be very inconsistent, incompatible with periodic peaks. Daily, seasonal and event triggered peak data loads can be difficult to manage. Moreover with unstructured data involved.

5) Complexity: Today's data comes from multiple sources. However, It requires to be connected and correlated with relationships, hierarchies and multiple data links or data can quickly get out of control. A data environment may be along the ends in any one of the following parameters or a combination of them, or even all of them together.

3. Big Data Analytics

Today, people not only want to collect data, they want to understand the meaning and importance of the data and use it to assist in decision making.
Data analysis is the process of applying algorithms to analyze data sets and extracting previously unknown patterns, relationships, and information. Moreover, the data analysis are used to extract patterns that were previously unknown, useful, valid, and hidden information large data sets, as well as to detect significant relationships between stored variables. Therefore, analytics have had a significant impact on research and technologies as decision makers have become more and more interested in learning from the big data, thus gaining a competitive advantage. Big data analytics have a significant difference with traditional data-processing architectures along a number of dimensions:

1) The speed of decision making is very important for decision makers.
2) Processing complexity, as it facilitates the decision-making process.
3) Transactional data volumes that are very large.
4) Data structure data that can be structured and unstructured.
5) The flexibility of processing / analysis consisting of the amount of analysis that can be performed on it.
6) Concurrency.

Big Data and analytics is not only about a deep analysis of huge amounts of data. The real power of Big Data & Analytics reaches the surface only when data from different internal and external sources, both structured and unstructured combined. This combination leads to new ideas, allows the development of innovative products, create new business models or can lead to substantially greater efficiency in processes. The Big Data Analytics and therefore is not collecting data, but rather translate the data into knowledge and ideas that help build a better society.

4. Big Data Analytics Techniques

Big data analytics uses advanced techniques such as machine learning, predictive modeling, text analysis, statistical analysis and forecasts. It will help identify trends, weaknesses or determine the conditions to make better decisions about the future which can be very significant to the relevant area. Techniques implementing Big Data are driven by the specified applications.

Optimization : This method are applied to solve quantitative problems in many fields, such as physics, biology, engineering, and the economy.
Statistics : It is the science of collecting, organizing and interpreting the data. Statistical techniques are used to exploit correlations and the causal relationships between the different objectives.
Data mining: It is a set of techniques to retrieve valuable information (patterns) from data, including cluster analysis, classification, regression and association rules.

Machine learning: It is an important subjugation of artificial intelligence, which aims to design algorithms that allow computers to develop behaviors based on empirical data.

Visualization: This approaches are the techniques used to create tables, pictures, diagrams and other forms of intuitive visualization to understand the data.

Social Network Analysis (SNA): This has emerged as a key technique in modern sociology, believes that social relationships in terms of network theory, and consists of nodes and links.

5. Traffic Problems

Traffic congestion is a condition in transport networks that is characterized by slower speeds, longer trip times and increased vehicular queuing. The most common example is the physical use of roads by vehicles. When traffic demand is high enough then the interaction between the vehicle slows down the speed of the traffic stream, this resulting in traffic congestion.

As demand approaches the capacity of a road (or intersections along the road), sets extreme traffic congestion. When vehicles are stopped completely for long periods of time, this is known colloquially as a traffic jam or traffic snarl-up. Traffic congestion can lead to frustrated drivers and may result in road rage.

Cities eventually are reaching a point where more roads and streets are simply not possible. That’s where the innovative solutions have to come into play. Big Data analytics being a very robust tool in analyzing huge data, will be handy in study of traffic patterns & can be pivotal in the ongoing effort to help cities better manage their traffic problems.