Joanna Riascos

Dr. Sylvain Jaume

Assignment Two

Capstone: Big Data & Bus Analytics

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**Data Set Loading and Data Summary**

“Smart City” is the city that leads the world. A smart city is a developmental plan vision that implements information and communication technology (ICT) and Internet of things (loT) to manage a city’s assets. It is used in schools, hospitals, community services and power plants etc. The purpose of a smart city is to improve a city’s way of living. It enables mayors and officials to monitor how a city is doing and how the city could improve to provide a better quality of life for its citizens. The cities that have already implemented smart technologies are the following: Amsterdam, Barcelona, Madrid, Southampton, Milton Keynes, Stockholm, and China. Correspondingly, in India they have a “smart cities mission” that was created by the government of India, they have a mission of developing a hundred cities all over the country. The implementation of information and communication technology helps in reducing costs and resource consumption in a city. There are various benefits for having smart technologies employed in cities such as, increased revenue, improved transportation, reduction in crimes, better city planning, recycling, reduction of waste and improved health care. One example is that authorities will have the ability to monitor via the web water and pressure levels. According to a study from the New Jersey Institute of Technology (NJIT), smart technologies “will generate revenues of more than $27.5 billion by 2013.” And 88 cities around the world will adopt these smart technologies by 2025.

Parking is the foundation of a smart city. Smart cities are in the need to look out for reducing parking and street congestion issues. Parking plays a major role in finding a solution to these issues. As reported by the Information Technology Services Reports, “Thirty percent of all traffic congestion in urban areas is caused by drivers looking for a parking space.” Traffic congestion has always been a frightening and global issue that is increasing since there are more drivers in the streets. Also, searching and finding a parking space is sometimes nearly impossible. According to a report, “Smart Parking could result in 2,20,000 gallons of fuels saving till 2030 and approx. 3,00,000 gallons of fuels saved by 2050, if implemented successfully.” With the implementation of smart technologies in parking, the driver should be able to obtain information and see in real-time available parking spaces. As well, it will allow the drivers to reserve their parking spaces ahead of time. This implementation will reduce car emissions since drivers won’t have the need to drive in circles until they find a parking spot. Similarly, it may reduce stress for the drivers because the majority of times drivers argue over parking spaces.

Many others of the benefits that the cities may have by employing “smart parking” is help traffic in the city to flow more freely, increased mobility, greener cities, optimize parking space usage, enable smart decisions by using big data analytics, monitor and manage available parking spaces, increased revenue, and savings of car fuel. Likewise, there will be savings in paper costs since smart phone applications can take care of the billing aspects of paying for parking reservations. The development for creating “smart parking” consists of building a workflow. The smart parking workflow analysis consists of six different processes. The first process is the one single gateway covers one area of 1 square Km. Next; the gateway sends the data via the Internet to the database. Then, if a vehicle is parked the occupancy is reported instantly to the users. Afterwards, the central control system gets real-time data about parking occupancy during the day. Subsequently, when a user is connected to the payment system the parking authorities can identify if a driver paid or not. Lastly, when a car is parked the sensor is detected.

Moreover, the dataset that we chose to analyze was the parking dataset. The parking dataset comes from the City of Aarhus in Denmark. It contains data from May 22nd 2014 until November 4th 2014 and February 2015 until October 2015. There are a total of eight parking lots. The first Excel csv file contains the following fields: vehicle count, update time, id, total spaces, garage code and stream time. The second csv file has the following fields: garage code, city, postal code, street, house number, latitude and longitude. The data was loaded and read in Zepellin. We imported the apache spark sql function and the date time format packages. Then we adjusted the path and added the location of the data to the script. The data fields that we didn’t include when loading our data was the id, update time, and stream time since we believed that those fields didn’t give us any meaningful information. The vehicle count is the number of vehicles that park in the parking lots, the total spaces is the number of available parking spots, and garage code is just the code to enter the garage. The postal code is just the city’s postal code, the street is where the house is located, the house number is just the house’s number, latitude and the longitude are the geographical coordinates.

In conclusion, smart cities and smart parking are the future of the world. They are the way to go. Smart technologies help the city’s assets and improve its citizens’ way of life. Likewise, big data analytics plays a major role in the process of implementing these technologies since big data helps in the identifying new and efficient ways of doing smarter businesses. The more data that we collect, the better because with a lot of data we can analyze and make more meaningful conclusions and decisions to help solve a problem or issue. Smart cities and smart parking are a result of big data analytics since they go hand in hand. The smartness of a city’s information is extracted from the data sources of the government and healthcare, etc. That’s the reason why we should all get together to implement these smart technologies all over the world.