**A DATA REPORT ON UPGRADE OF TECHNOLOGY INFRASTRUCTURE BY MTN COTE D’IVOIRE**

**Business Understanding**

MTN Cote D'Ivoire is a leading telecom company in Côte d'Ivoire. Being a telecom company they provide telephone, Internet, data, and other services to customers through the transmission of signals over networks of radio towers.A large component of this industry segment consists of **companies** that provide cellular phone service, which has grown rapidly over the past decade. After a discussion with the MTN company stakeholders, we came up with the following business objectives:

1. Come up with a strategy that will help MTC cote d’Ivore company upgrade its technology infrastructure for its mobile users
2. Come out with a strategy to roll out the upgraded infrastructure within cities where there customers and users are located
3. Come up with an technology upgrade that will make MTN telecom company have a competitive advantage over their telecom rivals
4. Come up with technology roll out that will ensure customer satisfaction and a better user experience for its customers.
5. Come up with a strategy that will enable MTN telecom Company maximize profits in the telecommunications network.

Our Data science team will use the CRISP-DM methodology during this project period which consists of the following phases. Our data science will iterate through the phases so that we come up with a desirable deliverable for our client

1. Business Understanding (understanding business objectives and converting them into data mining problems, developing project plan)
2. Data Understanding (collection of data, verification of data quality, data exploration)
3. Data Preparation (data selection, cleaning, data formatting and integration, constructing the final dataset for modelling),
4. Modelling (selection of modelling techniques, building and assessment of a model)
5. Evaluation (evaluation of results in the context of business objectives, reviewing the quality of the process, further decisions on deployment)
6. Deployment (deployment plan, deployment execution and monitoring, final report and review of the project).

This project will be successful if the following conditions are met:

1. The project is completed within the required project period
2. The business gets a better strategy to upgrade its technology infrastructure
3. The business maximizes profits with the upgraded infrastructure
4. The business is able to compete favourably with its competitors
5. The users of MTN telecom get a better user experience with Upgraded infrastructure

Currently the business has provided our data science team with full access to data that is in CSV formats. As a project team we are required to come up with a strategy that will enable the business to upgrade its infrastructure for its mobile users. Currently there are no known risks and contingencies.

As the project team, our data mining data mining goals include:

1. A predictive strategy that will enable our client upgrade its technology infrastructure
2. Accuracy of the strategy used in rolling out the technology infrastructure
3. Confidence in the strategy used in the rolling out of the technology infrastructure

**Terminology used**

1. **Data- facts and statistics collected together for reference or analysis.**
2. **CSV- Comma separated values**
3. Technology Infrastructure- **ure** is defined broadly as a set of information **technology** (**IT**) components that are the foundation of an **IT** service; typically physical components (computer and networking hardware and facilities), but also various software and network components.

**Data Understanding**

MTN Cote D'Ivoire Telecom company gave us full access to their data in the form of excel sheets and CSV datasets. The Data Sets include:

* Cells\_geo\_description.xlsx
* Cells\_geo.csv
* CDR\_description.xlsx
* CDR 20120507.CSV
* CDR 20120508.CSV
* CDR 20120509.CSV

The Data given to us will be analysed using the Google Collab Notebooks.

After a gross exploration of the datasets provided we came up with the following findings:

1. The Cells\_geo\_description.xlsx dataset had three column names which are Column Name, Description and String and 11 rows
2. The cells\_geo.csv the column have not been split well and it has 3975 rows
3. The CDR\_description.xlsx has 3 columns namely Column\_Name, Description and Format and 10 rows.
4. The remaining 3 datasets have almost the same column names which are CELL\_ON\_SITE,DW\_A\_NUMBER\_INT,DW\_B\_NUMBER\_INT,COUNTRY\_A, COUNTRY\_B, CELLID, SIET\_ID

After carefully examining the datasets provided, we came up with conclusions that The CDR 20120507,CDR 20120508 and CDR 20120509 had similar column names hence can be joined. We also found out some missing values in the data sets. Some column names were misspelled wrongly so we have to correct the mistake. We also found out that the cells\_geo.csv, the columns were not split so we have to sort it out by splitting it into respective column names.

**DATA PREPARATION**

The project team decided that we would use the CDR20120507(TelecomDataset1),CDR 20120508(TelecomDataset2), CDR 20120509(TelecomDataset3) and the cells\_geo.csv as they are relevant to our analysis.

We cleaned the data in datasets using pandas by:

1. Using duplicated() and drop\_duplicates() functions to find duplicates in the data sets and delete them.
2. Using the isnull() and dropna() we were able to delete missing value in our data sets
3. We also named the telecom1,telecom2, telecom3 data set in a uniform way to allow us to join them with no difficulties
4. We combined the datasets using the merge function so that we could use them in analysis

**MODELLING**

The project team used exploratory data modelling techniques using pandas and numpy arrays.

We used pandas to:

1. Determine the most used city for the three days
2. Investigate the most used cities during business and home hours
3. Look for the most used city for the three days

**EVALUATION**

After a detailed analysis and modelling of the data, we came up with the following findings:

1. The most used cities was COCODY with a value of 354, followed by Yopougon with a value of 295, ABOBO with a value of 255 and lastly Marcory with a value of 141

**CONCLUSION**

Mtn telecom company should roll out their upgrades in COCODY, Yopougon, Abobo as there are many people who use their network. Rolling out a technology in this cities would increase their revenue as most of their customers are there.