## **Business Understanding**

### **Business Overview**

The goal of this project is to determine the best strategy MTN Cote d’Ivoire can adopt in upgrading its technology infrastructure for its mobile users. Information to determine which strategy to adopt will be provided by MTN and will answer the following questions.

### **Business Objective**

The main objective is to come up with the best infrastructure upgrade strategy.

### **Business Success Criteria**

In order to determine whether whatever strategy adopted will be good for the company or not, we shall use data analysis to come up with the most significant strategy that should be used in order to achieve the stated objectives.

### **Assessing the Situation**

1. Resource Inventory
2. Datasets(5)

* CDR\_description
* cells\_geo
* cells\_geo\_description
* Telcom\_dataset
* Telcom\_dataset2
* Telcom\_dataset3

1. Software(Github, Google Colab)

      2.  Assumptions

        The data provided is correct and up to date.

     3.  Constraints

        There are no constraints

### **Data Mining Goals**

The data mining goals of this project is to:

* Determine which cities use MTN products the most and which do not.
* Determine which product(s) are the most used among the user
* Determine use of product(s) by date
* Determine which regions use MTN products the most and which do not
* Determine which city(s) will require an upgrade in its infrastructure?

**Data Mining Success Criteria**

 To determine where MTN will focus with the technology infrastructure upgrading process

## **Data Understanding**

### **Data Understanding Overview**

Data will be from MTN Cote d’Ivoire Telecom Company. The data includes the geographical data about the mobile users and product information.

### **Data Description**

A data description has been provided by the company detailing what the data sets include and provide meaning to the data

* CDR\_description - Description of columns in the Telcom dataset
* Cells\_geo - Has geographical data for MTN
* Cells\_geo\_description Description of columns in the Cells Geographical dataset
* Telcom\_dataset - Has MTN customers data
* Telcom\_dataset2 - Has MTN customers data
* Telcom\_dataset3 - Has MTN customers data

    Data Exploration

The data mining questions identified shall be addressed in form of queries, data visualization and also include reporting techniques. The data shall report findings based on the questions and any other information that may have been omitted.

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### **Verifying Data Quality**

The data was examined and the quality of data was determined to be well represented but needed cleaning as some data was presented with errors. The data was viewed as correct and had few typos and missing values

## **Data Preparation**

These are the steps followed in preparing the data

#### **Loading Data**

The data to be used for analysis was loaded into google colab and creates data-frames from the csv and excel files

#### **Cleaning Data**

The data set used in the project was clean using the python programming environment and this aided in generating results and providing analysis much faster.

Changed column names of the telcom datasets to align with what was provided in the description. All the missing values were dropped.

#### **Merging of the Datasets**

The telkom data sets were cocantated together and the resultant data frame was merged with the Cells Geo dataset

#### **Deriving New Attributes**

Changed the date\_time column to datetime datatype then split the column into date and time.

After cleaning the data, a new dataset was created from merging and concating the cleaned datasets.

## **Analysis**

Based on the assessment results and the process review

* The most popular product of the MTN catalogue was texts

PRODUCT

Voice 21392

sms 29253

* The regions with the highest number of product use were

PRODUCT REGION

sms LAGUNE 20779

Voice LAGUNE 12509

sms BAS SASSANDRA 1304

HAUT SASSANDRA 1281

LACS 1264

Voice LACS 1220

BAS SASSANDRA 1091

HAUT SASSANDRA 1020

VALLEE DU BANDAMA 828

sms SUD BANDAMA 768

* The cities with the highest number of product use were

The top three cities for the sms product are

YOPOUGON 5560

ABOBO 4260

COCODY 2105

Top three cities for voice

YOPOUGON 2980

ABOBO 1935

COCODY 1709

* The regions with the lowest product use were

PRODUCT REGION

sms BAFING 36

Voice BAFING 66

sms ZANZAN 93

SUD COMOE 93

Voice SUD COMOE 111

sms MOYEN COMOE 135

DENGUELE 147

Voice MOYEN COMOE 186

sms NZI COMOE 206

MOYEN CAVALLY 225

* The cities with the lowest product use were

The bottom three cities for the sms product are

BIANKOUMA 3

TAFIRE 3

BECEDIBRIGNAN 3

Bottom three cities for voice

KOTOULA 2

DANANON 2

GUIBEROUA 3

* Product usage by date

date PRODUCT

2012-05-09 sms 12262

2012-05-08 sms 8967

2012-05-07 Voice 8353

sms 8024

2012-05-08 Voice 7123

2012-05-09 Voice 5916

The product voice had the most use on 7/5/2012 compared to sms which had the most usage on 9/5/2012

## **Recommendations**

A plan on how to woo mobile users in the cities identified as not having many users of MTN can be put in place based on these results that will ensure a sure incline in profits after upgrading the technology infrastructure of its mobile users in those regions.

Link to colab file

<https://colab.research.google.com/drive/1g8AlZbIFuQ8hSCfG4uKb_D1ovG4r6Qob#scrollTo=qfK2iZ1rYbnO>