

# MAKERERE



# UNIVERSITY

COLLEGE OF COMPUTING AND INFORMATION SCIENCES

DEPARTMENT OF NETWORKS

BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING (YEAR 2)

RECESS TERM 2 (BSE 2301)

PROJECT REPORT FOR

CHAT ANALYSIS APPLICATION FOR NEW VISION

**PROJECT MEMBERS [GROUP 3]**

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## **1.0 INTRODUCTION**

This New Vision chat analysis Project was undertaken as a mandatory requirement for the course “Professional Software Engineering Mini Practical Project II” that is being conducted by Makerere University at college of computing and information sciences. The aim of the course is to equip students with data analysis skills. In this course we, as group 3 developed New Vision chat analysis application, which is a data analysis tool meant to be used in analyzing and visualizing data at New Vision Uganda in order to guide them in making smart and better decisions. It analyses and visualizes data inform of visual diagrams (i.e. graphs, word cloud) that provide a clear review and analysis of data.

### **1.1 Purpose of this document**

This document provides an overall description of the New Vision chat analysis app project including the description of the app design and the cost summary. It also explains the work experience gained from this project.

### **1.2 Intended Audience**

The intended audience of this document include:

- ❖ Our customer (New Vision Uganda); It will be fundamental in determining whether the completed application can be of use or not to it as a company.
- ❖ Our supervisor/advisor (Mr Noah Kange); It will enable him in evaluating whether the final implemented application is up to standards according to what he advised us to do.

### **1.3 Scope**

This chat analysis application analyzes information exchanged between clients and operatives of New Vision via an online chat inform of visual diagrams (i.e. graphs, plots, word cloud etc) that will be used to provide a clear review and analysis of data. For example it will output:

- ❖ A bar graph indicating performance of operators
- ❖ Pie chart that shows the most queried department or the department that many clients have subscribed to, in order to interact with it.
- ❖ A word cloud indicating the most common meaningful words within the chat content

## **1.4 Background and Objectives**

### **1.4.1 Project Background**

From the dataset given and according to our analysis, Chat analysis app was about reviewing work of customer support department of New Vision Uganda and how best the app can be used to analyze data effectively for senior corporate staff at New Vision to look out on how to improve service delivery by checking the performance of operators where necessary.

### **1.4.2 Main Objective**

To develop a data analysis application for reviewing, analyzing and visualizing data for New Vision

#### **1.4.2.1 Specific Objectives**

- ❖ To analyze and visualize chat content from the customers with an aim of displaying the common meaningful words within the chats that may guide the New Vision customer support department in determining the most common complaints from their customers.
- ❖ To analyze and visualize the emotional reaction of the customers towards the department's customer service.
- ❖ To visualize the most hard working or active operator among company operators, this will guide the department in performing employee morale boosting.
- ❖ To provide better decision making tools that will be used by the New Vision corporate staff in making better and smart decisions towards their customer service delivery for example the application will produce various visualization models like bar graphs etc which can be used in making effective decisions.

## **1.5 Overview of this document**

The remainder of this document includes seven chapters.

The second chapter provides a description of the project organisation. It gives the description of the project group; the group members and their responsibilities.

The third chapter provides a description of the milestones and the project cost summary which include the estimated and actual costs.

The fourth chapter provides description of the architecture overview. It explains the details of the architectural design and the user's perspective of the system.

The fifth chapter provides the product overview which gives basic functionality of the application. It describes the features of the application.

The sixth chapter gives the details of the project results. It gives all the details on the requirement compliance matrix, testing and results, work product and deliverables.

The seventh chapter provides the project experiences. It explains the experiences and challenges gained or faced during the course of the project.

The eighth chapter gives the general conclusion. Finally the ninth chapter provides the Appendix which includes the abbreviations and their full and the reference materials.

## 2.0 Project Organization

### 2.1 Project Group

TEAM MEMBER	RESPONSIBILITIES
Noah Kange	Advisor/Supervisor
Asingwire Dallington	Project manager,programming,design,documentation and organisation
Mutungi Denis Sharp	Programming,design and documentation
Kalema Arnold	Programming,design and documentation
Nanjuki Saidat	Programming,design and documentation

## 3.0 Milestones

PT stands for Project Team

Milestone Description	Responsible Dept./Initials	Finished week			
		Plan	Forecast		Actual
			Week	+/-	
Concept Paper	PT	06-06-18	1	0	13-06-18
System Requirement Definition	PT	13-06-18	1	0	20-06-18
System Design Definition	PT	27-06-18	1	0	4-07-18
System development	PT	22-06-18	4	0	22-07-18
Final Presentation & delivery	Supervisors	25-07-18	0	0	25-07-18

### 3.1 Project Cost Summary

Initial project costs were estimated to be \$20.4, planned to do project documentation and travel of project members but in the end the actual costs were \$22.2.

Estimated costs	\$20.4
Actual costs	\$22.2

## 4.0 Architecture Overview

The design of this New Vision data analysis application follows the client/server architecture where by the client is represented by user Interface which is used to send requests to the server, which then services the requests of the client.

In this chat analysis application, the U1.R gets data from the user and sends it to the server. The server manipulates the data and sends the results in form of visual diagrams such as bar graphs, pie charts and word cloud which are displayed to the user on the user interface.

**NOTE:** Refer to the software design document of New Vision chat analysis application to see the diagram of the architectural design of this application.

### 4.1 User Perspective of the Application

User interacts with the user interface through which the user can place requests. The interface responds by displaying requested services after contacting the server.

## 5.0 Product Overview

This application consists of two interfaces that is a login page and an interface that has full functionality of the application.

### 5.1 Features of The New Vision Chat Analysis application

#### 1.Login Interface.

This is used to authenticate users. It requires entry of ones username and password and it is only when one enters registered corresponding login details that he or she will be allowed access to the full functionality of the chat analysis app.

#### 2.Main Interface

This basically contains the full functionality of the whole app. Majorly it contains the tab set panel.

### **Tab set Panel with in Dashboard body**

This consists of a list of tab panels used in uploading file, viewing uploaded data, analysing and visualising data. For each tab panel, app user must click on it to see its functionality.

The following are the tab panels on the tab set panel:

- ❖ **Home**-This is just an index page. It is just static.
- ❖ **Upload file**-This lets the user to browse, select and upload the file that contains data to be analysed.
- ❖ **Statistics**: This lets the app user to view analysis models like pie chart and bar graph.
- ❖ **Sentiment analysis**. This provides app user to select options of visualization models like wordcloud, look at performance of operators and others.
- ❖ **Department analysis**. This allows the user to select a department and then select how often customers select that department per country.
- ❖ **Communicate**. This allows the app user to send an email to any person regarding performance especially company operators.
- ❖ **Others**. This enables app user to select system assistant to see how many chats he or she was involved in total and how many on a certain date as well.
- ❖ **Download**. This enables app user to download visualization model of choice
- ❖ **Help**. In case of any authorized app user does not know how to use the app especially new recruited staff member, he or she can refer to help tab panel to see guidelines on the app use.

### **NOTE:**

- ❖ In the SDD document, there are screen images which indicate how these features are arranged on the user interface and also how the different diagrams are displayed to the user.
- ❖ We also created a blog for this application under the URL <https://group3rdevelopers.wordpress.com> to help us in advertising our application. It contains all the necessary details of the application.

## 6.0 PROJECT RESULTS

### 6.1 Requirements Compliance Matrix

*Completed: Yes (completely implemented)*

System Requirement Description	Completed
Login interface should perform authentication very well	Yes
Authorised user should be able to upload a file to be analysed.	Yes
Authorised user should be able select a data analysis tool of his/her choice	Yes
Authorised user should be able to download the visualized Diagram	Yes
The application should be able create a meaningful word cloud from chat Content	Yes

### 6.2 Testing and Results

This New Vison chat analysis application was tested using the sample data set that was given to us by the Project supervisor. The developed app was able to analyze and visualize the data within the file in form of visual diagrams as we proposed.



### 6.3 Work Products and Deliverables

<b>To</b>	<b>Output</b>	<b>Planned Week</b>	<b>Promised Week</b>	<b>Late +/-</b>	<b>Delivered week</b>
Noah Kange	Concept Paper	<b>W1</b>	<b>W1</b>	No	<b>W1</b>
Noah Kange	System Requirement Definition	<b>W2</b>	<b>W2</b>	No	<b>W3</b>
Noah Kange	Project Design	<b>W3</b>	<b>W3</b>	No	<b>W3</b>
Noah Kange	System development	<b>W4</b>	<b>W4</b>	No	<b>W4</b>
Mbabazi Isaac & Kange Noah	Final Presentation & delivery	<b>W5</b>	<b>W5</b>	No	<b>W5</b>

## **7.0 PROJECT EXPERIENCES**

### **7.1 Positive Experiences**

During the course of this project we have gained a lot of experience for example:

- ❖ We learnt R programming and how to write useful programs in R. It has been the major developing tool of our application.
- ❖ We learnt how to work in a group.
- ❖ Most important of all we learnt how to perform data analysis using code.
- ❖ We gained more experience in documentation and organization.

### **7.2 Challenges Faced During Project Development**

The problems that we encountered were during package installation that is installing the required packages into Rstudio. Some packages were unavailable for the default installation which made the process of installing them a bit complicated for example xml2 in UNIX OS. Also due to many packages, laptops would freeze which led to inconveniences.

## **8.0 Conclusion**

Our goal was to develop a chat data analysis application that will output visual diagrams that can simplify the task of data analysis at the customer support department of New Vision Uganda, and from the developed application, we are confident that it has successfully met our goals and objectives of the project.

### **8.1 Findings**

- ❖ Uganda has most participants(customers)
- ❖ Japan is the foreign country with highest participants on New Vision online chat
- ❖ No chatting involved between 20:00 and 20:59
- ❖ Most selected department by customers is Customer support Department
- ❖ Employee involved in most chats is Joseph Banyu
- ❖ Least data is obtained from Came.from column
- ❖ Column 'City' has no data
- ❖ Most people start chat around 05:00 to 05:59
- ❖ Most word involved in chat data is welcome(positive communication)
- ❖ Most of waiting time between 09:00 and 09:59

### **8.2 Recommendations**

- ❖ Addition of one system assistant between 02:00 to 11:59 due to increase in number of people on chat.
- ❖ Adjustment of the New Vision web site to capture city
- ❖ Appreciation of most hard working system assistant(Joseph Banyu) with an award

### 8.3 Predictions

If the above recommendations are implemented, then we expect to have the following changes;

- ❖ Graph of chat starting time almost same as graph of chat sessions
- ❖ Ability to analyze more data from Came.from column
- ❖ Ability to analyze city data
- ❖ Increase in worker's morale hence more productivity
- ❖ More customers

## 9.0 GLOSSARY

### 9.1 Definitions and Acronyms

Acronym or Abbreviation	Definitions
App	Application
SDD	Software Design Document
OS	Operating System
URL	Uniform Resource Locator

### 9.2 References

[1] Software design document by group 3 2018