Software Design Document

Version 1.1

For

WhatsApp Data Analysis With R programming

Prepared by: **Group X**

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1 Overview

This System Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts, human-machine interfaces, detailed design, processing logic, and external interfaces for the whatsApp data analytics software.

2 Introduction

The System Design Document (SDD) describes how the functional and non-functional requirements recorded in the Requirements Document and the Concept document are transformed into more technical system design specifications from which the WhatsApp data analytics system will be built. The SDD documents both high-level system design and low-level detailed design specifications.

The SDD describes design goals and considerations, provides a high-level overview of the system architecture, and describes the data design associated with the system, as well as the human-machine interface and operational scenarios. The high-level system design is further decomposed into low-level detailed design specifications for each of the systems components, including hardware, internal communications, software, system integrity controls, and external interfaces.

2.1 Purpose and Scope

The System Design document documents and tracks the necessary information required to define the architecture and system design in order to give the development team guidance on architecture of the system to be developed. Its intended audience is the project supervisor, project team, and development team.

The purpose of this software design document is to provide a low-level description of whatsApp Data analysis system. It provides insight into the structure and design of each component. Topics covered include the following:

1. Data flow and design
2. Processing narratives
3. Algorithmic models
4. Design constraints and restrictions
5. User interface design
6. Test cases and expected results

In short, this document is to equip the reader with a solid understanding of the inner workings of the WhatsApp data analytics system.

2.2 Project Executive summary

Section 1: Overview:	Description of the design document.
Section 2: Introduction:	Brief explanation of the purpose, goals, and format of the System Design Document.
Section 3: System Overview:	Gives the High-level description of the system.
Section 4: System Architecture:	Describes the architectural design of the system.
Section 5: Human-Machine Interface:	This section provides the detailed design of the system and subsystem inputs and outputs relative to the user/operator.
Section 6: Detailed Design:	Gives full description of inner workings of the system and its components.
Section 7: Appendix:	Contains the glossary and document convention.

3 System Overview

The system will process data from WhatsApp using an R then produce processed data. The system shall be built using R shiny package which shall consist of a user interface object and a server function.

3.1 Design Constraints

The system will have some design constraints, which include:

1. Must have R language enabled for analysis and visualizations.
2. Must have all R required packages and libraries installed.

References

[1] Wikipedia, "Data analysis," jun 2018.

[2] Jovial, "Exploratory data analysis with r," jul 2014.

[3] K. Willems, "This r data import tutorial is everything you need," jul 2015.

4 System Architecture

This section outlines the system architectural design of the WhatsApp data analytics system. Data Analysis process includes Data Collection[1], Data Transformation, Data Loading, Exploratory Data Analysis[2], Data Visualization and Communicate/Report. Figure 1 displays the process of Data Analysis[3].

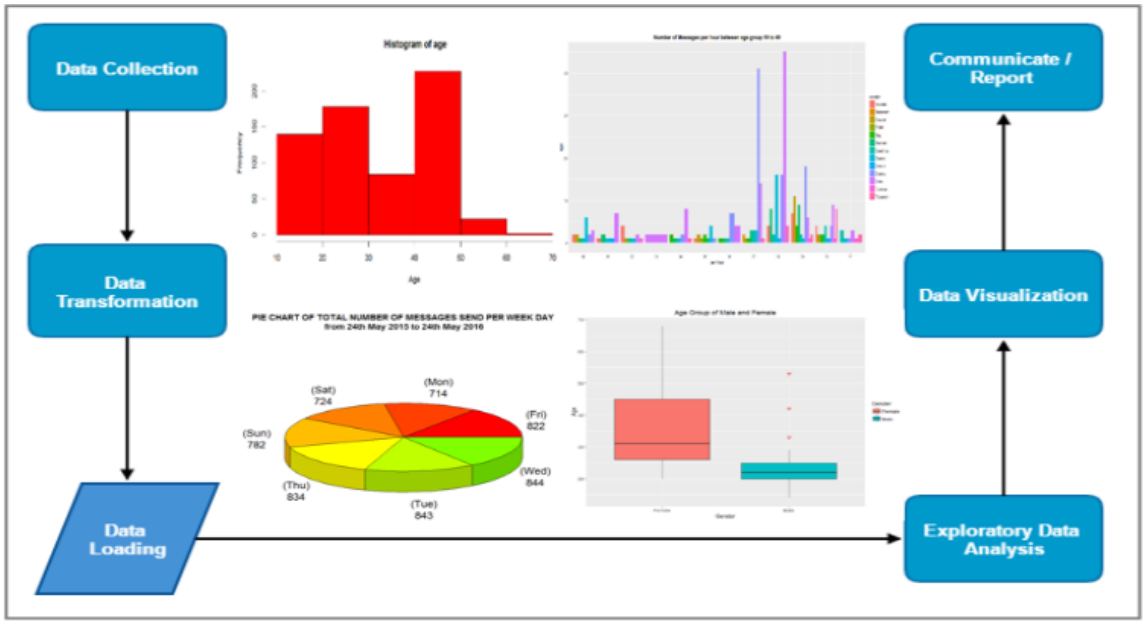

Figure 1: Process of data analysis

1. Data Collection is the first stage of the model that includes idea, defining project objective, setting up machine and lastly knowing your data.
2. Once the data on which analysis needs to be performed is known, it is transform from raw data (.txt) to useable data (.csv).
3. Data loading stage includes importing resultant csv file into RStudio.
4. Exploratory Data Analysis is the approach to data analysis for summarizing and visualizing the important characteristics of a data set
5. Data visualization involves presenting processed data in terms of graphs, charts, word cloud and summaries.
6. The data is then reported in a summary to give findings.

5 Human-Machine Interface

A human-machine interface is a graphical representation through which the end-users interact with the system. It anticipates what users might need to do. The Human-machine interface guarantees that the system features are easy to access, understand, and use to facilitate the actions provided.

5.1 Inputs

5.1.1 Import WhatsApp file

This is available to enable users to import a CSV or text file for analysis. The user will select and upload a text file or a CSV file. In RStudio, click on the Workspace tab, and then click on Import Dataset. Select From local file. A file browser will open up, locate the .csv file and click Open. A dialog box will appear that would mention a few options on the import.

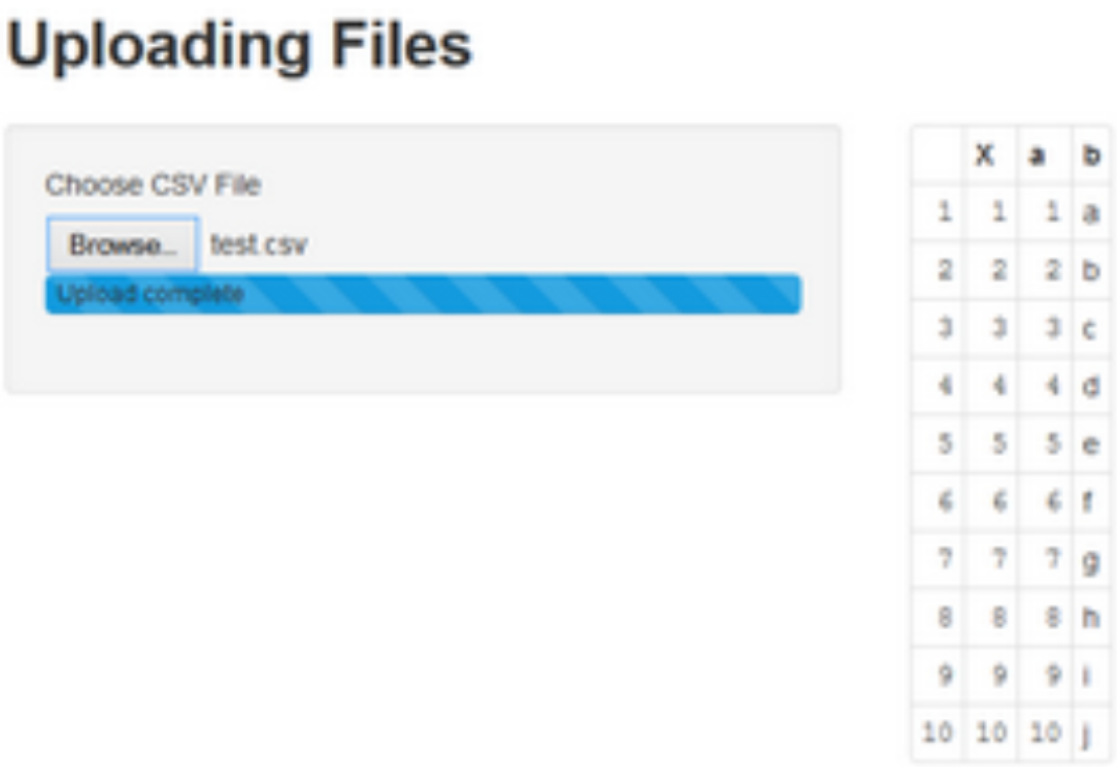

Figure 2: File Upload

5.2 Outputs

5.2.1 Word cloud

This will be output to show the most texted words in the the group chat.

Figure 3: Word Cloud

5.2.2 Sentiments

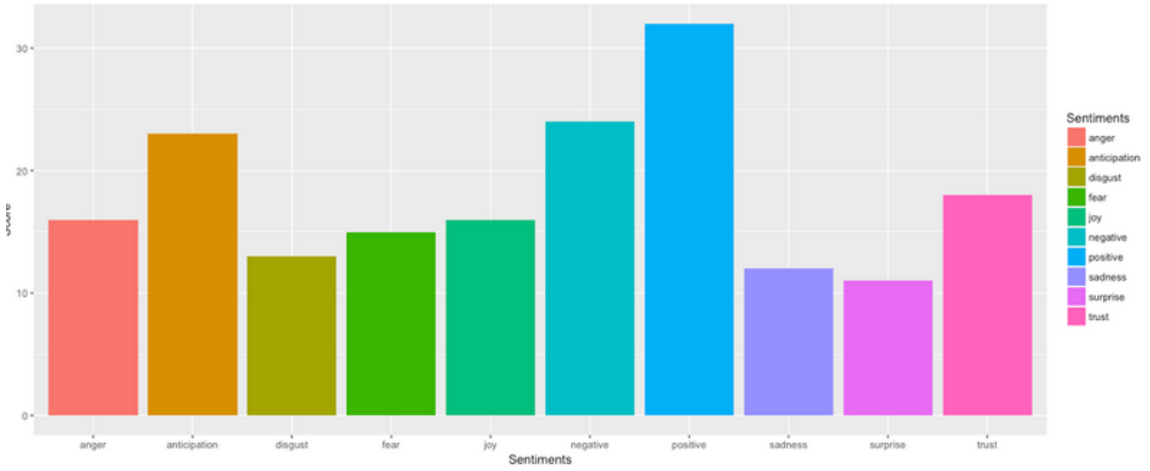

Figure 4: Sentimental analysis of whatsApp data

5.2.3 Total number of messages sent per hour per day per month

This output shows the number of messages delivered in an hour, day and month.

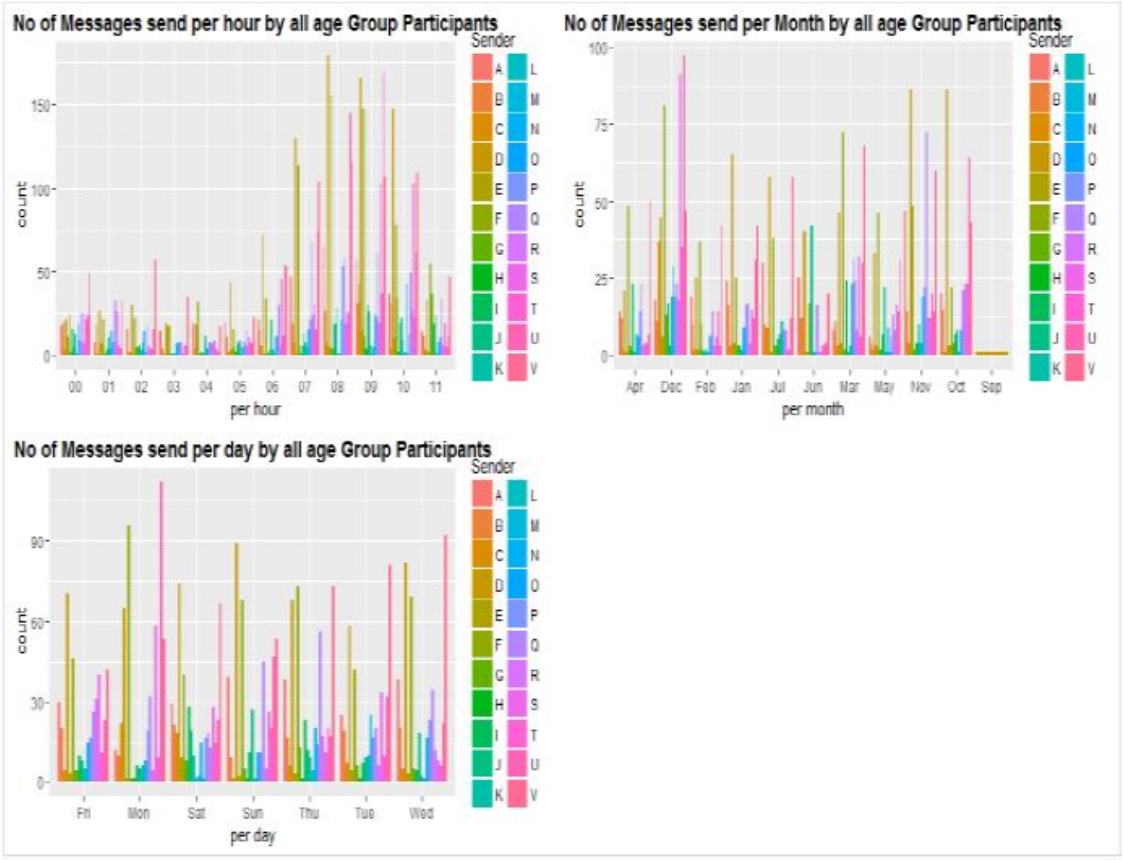

Figure 5: Number of messages in an hour, day and month

5.2.4 Total number of messages per time stamp

This shall show the total number of messages delivered during a given timestamp (Morning and Afternoon/Evening) categorized as AM and PM.

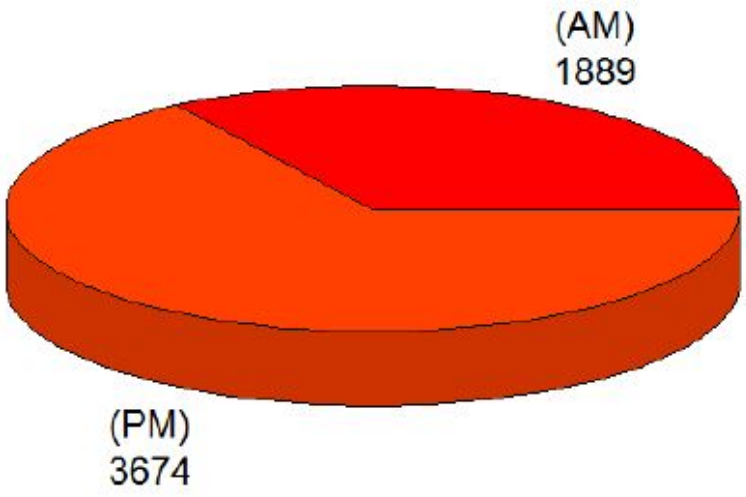

Figure 6: Messages Per Timestamp

5.2.5 Whether males are more addicted to WhatsApp group or females

This shall show which gender is more addicted to the WhatsApp group.

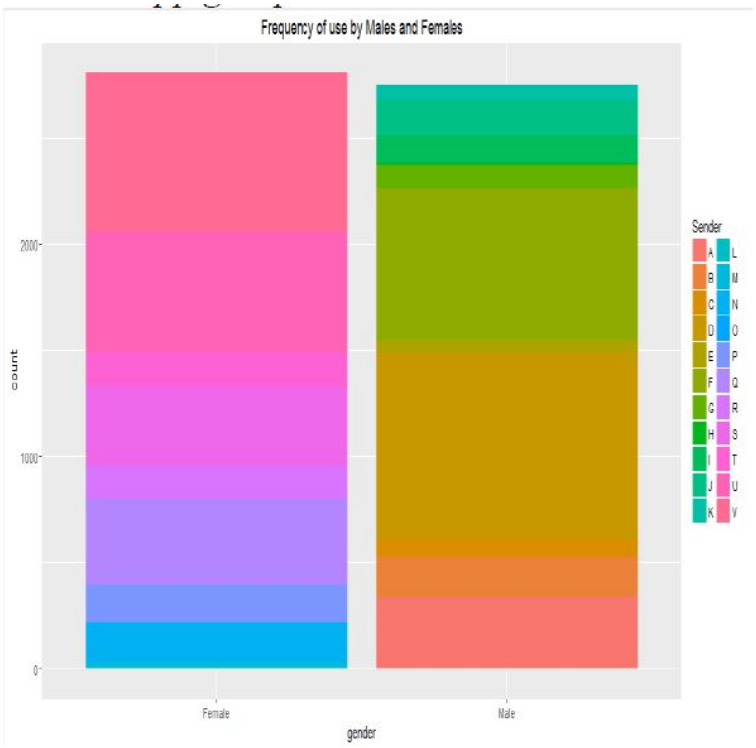

Figure 7: Gender addiction to whatsApp

6 Detailed Design

This section provides information needed by the development team to build and integrate the hardware components, code and integrate the software modules, and interconnect the hardware and software segments into the functional product. Additionally, this section addresses the detailed procedures for combining separate System components into a single system.

6.1 Software Detailed Design

The system implemented with R. R is to run on shiny R package, which creates an app for easy user interaction. To run R shiny, shiny package shall be installed. R library shall be imported in the created file.

The systems major responsibilities are to visualize and analyze the WhatsApp data. The system consists of three R files in the same directory: the main file, the server file and the UI file as show in figure below.

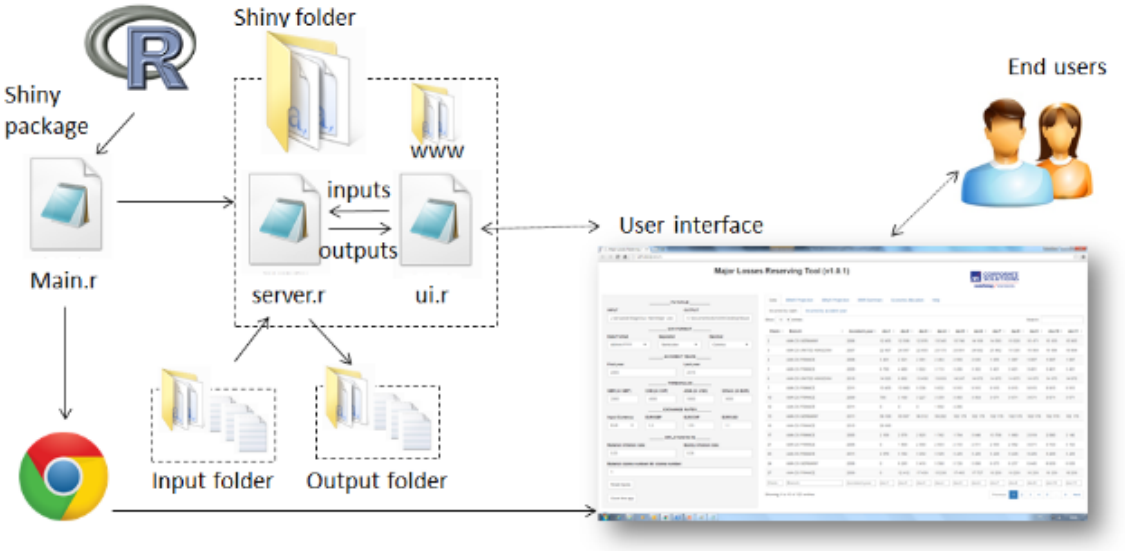

Figure 8: System design using R shiny

Appendix

Denitions, acronyms, and abbreviations

Term	Description
IDE	Integrated Development Environment
IEEE	Institute of Electric and Electronic Engineering
Internet	A collection of computers, and software networked
Programming Language	A set of rules and tools required to make computer programs
R Package	Helper program written to extend functionality of R programming language.
R Script	Document that contains R code or instructions. Interpretable by the R engine.
SRS	Software Requirements Specification Windows operating system by Microsoft corporation