Table of Contents

[1. Introduction 1](#_Toc518476845)

[1.1 Purpose 1](#_Toc518476846)

[1.2 Scope 1](#_Toc518476847)

[1.3 Abbreviations and Acronyms 1](#_Toc518476848)

[1.4 References 2](#_Toc518476849)

[1.5 Overview 2](#_Toc518476850)

[2. System overview 2](#_Toc518476851)

[2.1 System characteristics 2](#_Toc518476852)

[2.2 System Architecture 2](#_Toc518476853)

[3. System context 4](#_Toc518476854)

[4. System Design 4](#_Toc518476855)

[4.1 Design methods and standards 5](#_Toc518476856)

[4.2 Naming conventions 5](#_Toc518476857)

[4.3 Software development tools 5](#_Toc518476858)

[4.4 Outstanding issues 5](#_Toc518476859)

[4.5 **Decomposition** description 5](#_Toc518476860)

[5. Component description 6](#_Toc518476861)

[6. Requirements Traceability Matrix 8](#_Toc518476862)

[7. Glossary 9](#_Toc518476863)

# Introduction

The Software Design Document is a document that provides documentation which will aid in the development of the system by providing details of how the software should be built. Within the software design document are narrative and graphical documentation of the software design for the project including flow diagrams, use case models and other supporting requirement information.

# 1.1 Purpose

The purpose of this design document is to present a comprehensive architectural overview or technical details of the iOS mobile app analysis system components and most specifically:

* The definition of system architecture, components, classes, their attributes and methods that will implement the requested functionality.

It presents a number of different architectural views to depict different aspects of the system. It is intended to capture the significant architectural decisions which have been made on the system.

The primary intended audience of this document are system designers and system builders. The document intends to provide the team members of this project a unified view of the technical details of the system design to be followed during the development of the respective software. The document may need to be updated later to incorporate possible changes during development.

# 1.2 Scope

The iOS mobile app analysis system studies the relationship between app features and user ratings in order to help iOS app developers have an insight on how these features contribute to the user rating. This in turn helps them draw more attention to those features will creating their apps so as to increase the user ratings for their apps.

The iOS mobile app analysis system is unified for the use of all iOS mobile app users and developers all over the world. It’s based in RStudio, a free and open source integrated development environment for R programming language installed on a computer with the Shiny packages and other relevant packages.

The goal of the system is to provide a visual and statistical representation of the comparisons of the app features and app details enabling iOS app developers have an insight on how these features contribute to the user rating

The objectives of the system are:

* To have an insight on how the different application details contribute to the user rating.
* To study the relationship between the different application features.
* To compare the statistics for the different application groups.
* To show the distribution of the user ratings of the different applications.
* To show the trending apps based on the average user ratings.
* To show distribution of emotions within the application description.

# 1.3 Abbreviations and Acronyms

|  |  |
| --- | --- |
| **Term/ Acronym** | **Description/ Meaning** |
| app | Application |
| iOS | iPhone Operating System |
| IEEE | Institution of Electrical and Electronics Engineers |
| IDE | Integrated Development Environment |
| REQ | Requirements |
| DESC | Description |

# 1.4 References

* SDD Template for IDA project

# 1.5 Overview

* Section 1 is the introduction and includes a description of the project, applicable and reference documents. It gives the reader an understanding of the system goals.
* Section 2 provides a system overview. This describes the system characteristics, system architecture, and infrastructural services.
* Section 3 contains the system context. This defines the external interfaces of the system.
* Section 4 describes the system design methods, standards and conventions.
* Section 5 contains the component descriptions. It describes how the different components of the system interact to satisfy the user needs.
* Section 6 includes the Requirements Traceability Matrix which shows the system components that satisfy each of the functional requirements from the SRS document.

# System overview

With the overwhelming number of alternative new apps coming up on the apple store, it is almost impossible to get more people to download your app. The system has been developed with an aim of analysing and visualizing app statistics on apple store using the various statistical tools of analysis and visualization to assist in increasing user ratings and to remain relevant to the market.

# 2.1 System characteristics

The system will be a client server web based system. The client side will be integrated with a web browser. It should gather information from users as requests and sends them to the server.

The server side should receive the requests from the client, verify whether the data corresponds to that in the different files/ datasets being used. If the inputs are correct then it should respond with requested data or else respond with some information to enable the user enter the correct information.

# 2.2 System Architecture

This is system is a client server web based system. In which the client makes requests and the server responds to the requests.

**CONCEPTUAL DIAGRAM**



figure 1: conceptual diagram 1

# 2.3 Infrastructure Services

The system will have the following added functionalities for its effective use:

* The response time is expected to be fast to increase efficiency, with a maximum waiting time of thirty seconds. This prevents the user from assuming that the system is down.
* The system will allow multiple users at a time.
* The system should have a very low consumption of power.
* The system should be able to perform failure handling that is the system components may fail independently of others so system components must be built so that they can handle the failure of other components they depend on.
* The system will be well documented to enable proper maintenance and in cases of further development and changes, the development team will perform the necessary changes.
* The entire system should be available round the year, except for a periodic maintenance. The maintenance period should be pre scheduled and short. The users should be reminded of the unavailability period, well in advance.

# System context

This system should be in position to allow a user access on their local machines when not connected to the internet. Further upgrades will be made for the user to access the system by entering the system’s URL in a web browser where they will be directed to the home page.

The system will then require http to communicate with the server and will be accessed via port 8080.

The functionalities of the system are defined more in the context diagram below;

**THE CONTEXT DIAGRAM OF THE MOBILE APP ANALYSIS SYSTEM**



figure 2: context diagram

**LEVEL ZERO DIAGRAM**



figure 3: level zero diagram 1

# System Design

As the development team, we will use R Studio tools and shiny server in hand with GitHub to develop the system. We have chosen this approach because the different techniques in the R Studio IDE will enable us perform statistical commuting and graphical representation of data. R shiny package will also be used in order for the system to be interactive with the user . Whereas GitHub will enable the development team divide the project in different modules and each member will handle a module.

# 4.1 Design methods and standards

In reference to the conceptual diagram in figure 1, the system will be web based. R Studio IDE and shiny server will be used to develop the system. The client side will be designed using the shiny user interface. The interface will enable the user interact with the system through making request.

The server side will be developed using shiny server. The server will be in position to verify the inputs, perform an analysis and provide statistics for the different inputs as response. The statistics provided by the system will be in graphical form.

# 4.2 Naming conventions

This document follows the IEEE format; bold faced font has been used for emphasis, headings and sub headings. Highlighted words are used in the glossary and italicized text is used in the diagram labelling.

# 4.3 Software development tools

These are some of the tools used in the design and development of the system.

|  |  |
| --- | --- |
| **Tool** | **Role played** |
| Microsoft Visio | Drawing the diagrams in the document |
| R Studio | An IDE for statistical commuting and graphical representation of data. |
| R shiny | Package that enables in developing interactive web apps. |

# 4.4 Outstanding issues

There aren’t many outstanding issues to talk about but as earlier stated, we are using the R studio IDE and the R shiny package for the development of the system.

# 4.5 Decomposition description

The system functionality has been broken down and is represented as a functional decomposition diagram and data flow diagrams.

**FUNCTIONAL DECOMPOSITION DIAGRAM**



figure 4: functional Decomposition diagram

# Component description

**Module 1: Data Analysis**

This module is the core part of the system and will be called frequently and its results will depend on the user commands. The user will choose which parameters to be analysed and how they should be analysed using the graphical interface.

Module inputs:

* User selections/choices

Module outputs:

* Analysis results
* Textual reports

**Module 2: Graphical Representation of results**

The analytical results from module 4 will be presented in a graphical view based on the user selections. A number of graphical features including but not limited to line graphs, bar graphs, pie charts, box plots will be used by this module to display data to the user. The user will select the tool they wish to use to view the results.

Module inputs

* User selections/choices
* Analysis results

Module outputs

* Graphs: Histogram, bar graph, scatter plot.

# Requirements Traceability Matrix

|  |  |  |
| --- | --- | --- |
| **System requirement No** | **Functional requirement** | **Description** |
| **REQ 1** | Show the relationship between different app features. | The system shows whether there’s a positive or negative relationship between the different application features. |
| **REQ 2** | Show how App details contribute to the user ratings | The system will be able to show whether the different application features lead to an increase or decrease in the user ratings. |
| **REQ 3** | Compare app statistics for different groups | The shows the total number of apps within the different application groups. |
| **REQ 4** | Show trending apps according to the different versions | The system shows average user rating of the different applications for the user to have an insight on those that are trending. |
| **REQ 5** | Analysing app descriptions | The system analyses all the app descriptions and accesses the different emotions within them. |

# Glossary

|  |  |
| --- | --- |
| **Term/ Acronym** | **Description/ Meaning** |
| app | Application |
| iOS | iPhone Operating System |
| IDE | Integrated Development Environment |
| IEEE | Institution of Electrical and Electronics Engineers |
| REQ | Requirements |
| DESC | Description |