COLLEGE OF COMPUTING AND INFORMATION SCIENCES

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RECESS TERM 2 (BSE 2301)

Software Design Document

For:

FIFA WORLD RANKING SYSTEM

GROUP 19

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1 INTRODUCTION

This document is meant to provide documentation which will be used to aid in software development by providing the details for how the system should be built. With in this document are narrative and graphical documentation of the software design for the project including use case models,sequence diagrams and other supporting requirement information .

Software Design Document (SDD) of FIFA world Ranking System provides necessary definitions to conceptualize and further formalize design of the software, whose requirements and functionalities were summarized in Software Requirements Specifications (SRS) Report. Aim is to provide guidance to a design which could be easily implemented by any programmer reading this report. The document complies with the IEEE standards (IEEE Std 1016 – 2009).

1.1 PURPOSE

This Software Design Document is intended to provide a software system design which will satisfy functional and non-functional requirements stated in Software Requirements Specification Document of FIFA World Ranking System. Purpose of this document is serving as a guideline throughout development phase of the project for developers.

This document is intended to be used by Software developers and system testers enable them to develop the system specifically in details according to the the management and technical material contained in this document.

1.2 SCOPE

This complete Software Design Document will contain the general definition and features of the project, design constraints, the overall system architecture and data architecture.

With the help of diagrams, design of the system will be explained visually in order to help the programmer to understand all information stated in this document correctly and easily.

Fifa ranking system will be used to visualise the "**FIFA**" world rankings of national teams from 1993 to 2018 particularly viewing the world based teams,National teams performances,best teams in different football confederation.

1.2.1 Benefits

This system will allow the user to search for particular rankings of a country and viewing both world and National team details ,this makes it efficient because all information will be properly described and available on the user interface with click able link buttons to direct the users .

1.2.2 Goal

To make visualised world ranking for the men's football national teams in form of graphs and diagrams .

1.3 DEFINITIONS, ACRONYMS AND ABBREVIATIONS.

FIFA -Federation of International Football Associations is the governing body for all football associations and its responsible for world ranking

UEFA-This is the football association for European countries

CAF-This is the football association for African football associations

CONCAF-This is football association for North American countries

OFA-Is a football Association for countries from Oceania Continent

AFA-Is a football Association for countries for the Asian continent

Visualization-This a process of representing data in form of diagrams and graphs for-example histogram

Shiny-Is a package in R used to design interfaces in R studio inform of web pages

Packages-This are r libraries that contain abstract methods used to generate and manipulate data in R

1.4 REFERENCES

[1] Software Design Document

1.5 OVERVIEW

This document consists of the following sections as explained below:

Section 1 is the introduction and includes a description of the project, applicable and reference documents.

Section 2 provides a system overview.

Section 3 contains the system context.

Section 4 describes the system design method, standards and conventions.

Section 5 contains the component descriptions.

Section 6 includes the Requirements Traceability Matrix.

2 SYSTEM OVERVIEW

2.1 SYSTEM CHARACTERISTICS

To provide information using simple graphical diagrams and graphs for example histograms

To the system will be responsive to be viewed on every device for example the mobile phones,tablets etc.

2.2 SYSTEM ARCHITECTURE

The diagram above shows the Fifa world ranking system architecture. This system is a client-server architecture whereby the user/client sends a request to the server/shiny server through an internet connection. The server responds with the desired information which is received as a response to the client.

The diagram below shows the system architectural design of the system (FWRS)

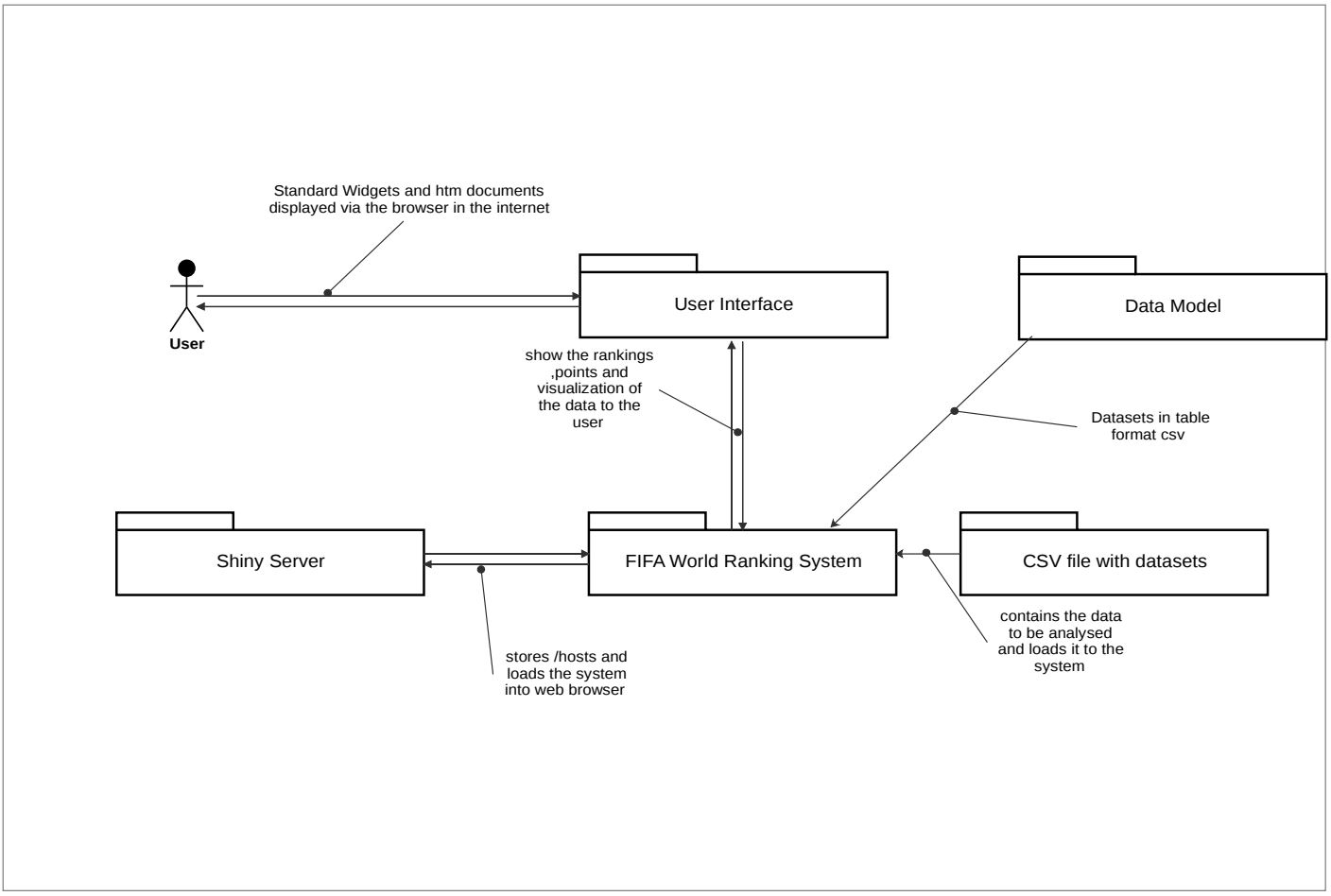


Figure 1.1 shows the architectural design of the FIFA world ranking system

2.3 INFRASTRUCTURE SERVICES

Presentation services

The system consists of a simple user interface which is easy to use because only involves click and selection of objects from the menu .

Data manipulation

The system manipulates data form the fifa-ranking system which is uploaded and accessed from the server side.

Presentation Logic

The information displayed on the system is represented graphically through the use of histograms,line graphs and bar graphs which makes user interactions easier.

Communication management

The system is web-based therefore the communication requires an internet connection and the system can be used remotely.

3 SYSTEM CONTEXT

The context diagram for the FIFA WORLD RANKING SYSTEM

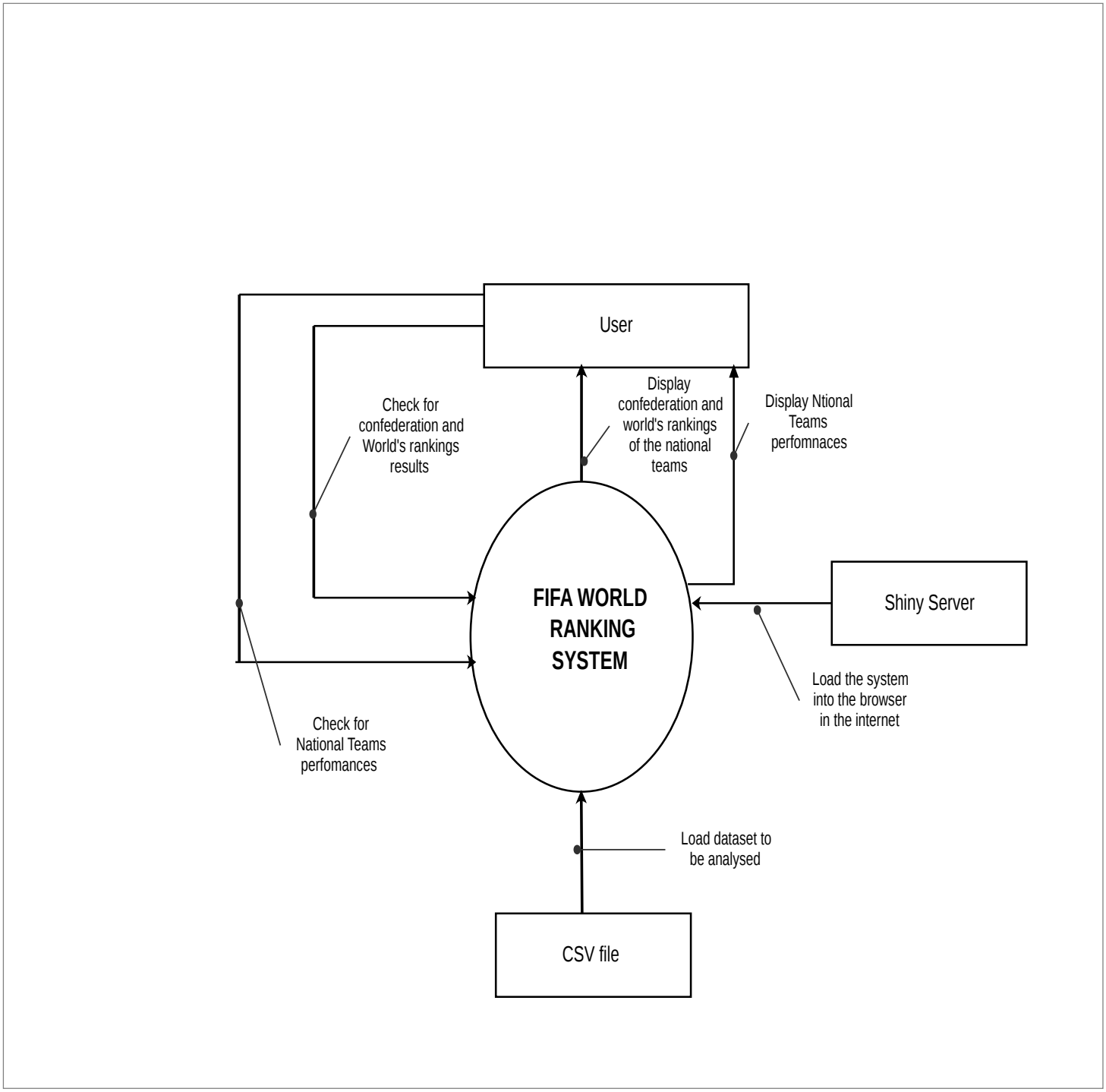


Figure 1.2 shows the context design of the FIFA world Ranking System

The level 0 data flow diagram of the FIFA world ranking system.

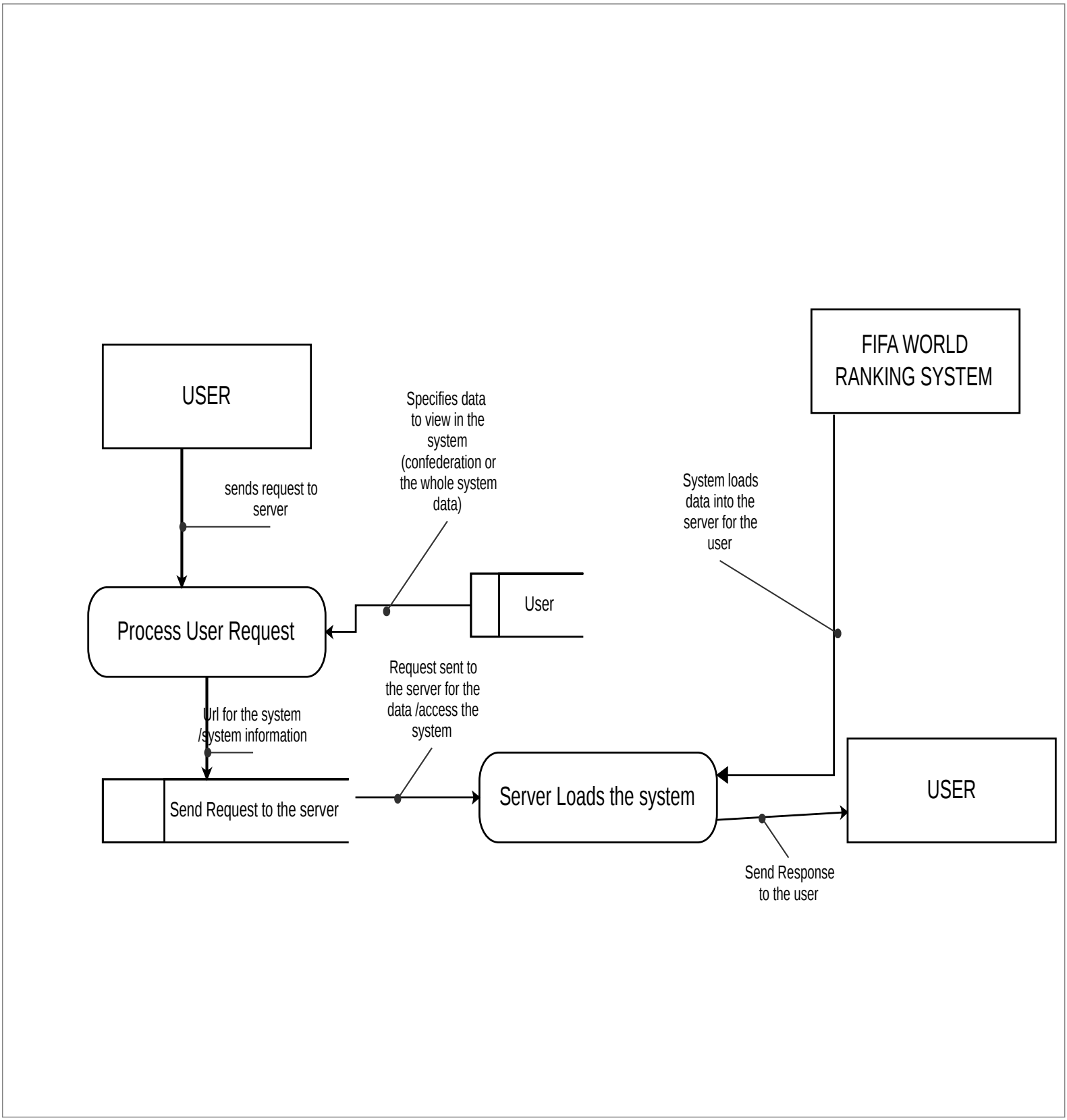


Figure 1.3 is a data flow diagram level 0

4 SYSTEM DESIGN

Unified Modelling Language, is a standardized modelling language consisting of an integrated set of diagrams, We are to use use case diagrams to help system and software developers for specifying, visualizing, constructing, and documenting the artifacts of software systems .

And the development approach RAD Rapid Application Development for speeding up the development process. The application will be developed using coding statements from four programmers.

4.1 DESIGN METHOD AND STANDARDS

The client server technology,sending data from the client to the server is accomplished by a function. We create a shiny user interface file (ui.R) and add the code to send data , the code is included by passing it as a function.

No the server side we simply access the data that was sent by addressing it the usual way via the input object(input$mydata) The code will make the elements result show the value that was initially passed to the server.

4.2 DOCUMENTATION STANDARDS

When using Rstudio to create shiny applications the code is documented using # tag at the beginning of every line of code that is to be documented.

4.3 NAMING CONVENTIONS

The character sequences used for identifiers which denote variables, types, functions, and other entities in source code and documentation is similar or can be easily related to, for easy maintenance and understanding the code.

This reduce effort needed to read and understand source code.

4.4 PROGRAMMING STANDARDS

R is a powerful programming language for statistical work ,it helps in analysing of data.

Programmers will adhere to a single agile coding standard(including everything from tabs, spaces and curly bracket placement to naming conventions), everything works better.

Naming conventions use meaningful and descriptive names.

Identifiers for variable, preferably use camel Case letters.

Syntax to indent, use 4 spaces not tabs, for assignment, use <- not =.Go to the next line if the length is more than 80 characters.

Spacing, place spaces around all binary operators such as =, +, -, <-, etc place space before the (, except in a function call. Commenting should be identified with # followed by a space

Reference:R Style Guide by Hadley Wickham

4.5 SOFTWARE DEVELOPMENT TOOLS

Rstudio is to be used as an application development tool

The Browser to run the HTML, r code, JavaScript code.

LibreOffice and word office 2013 writer for documentation.

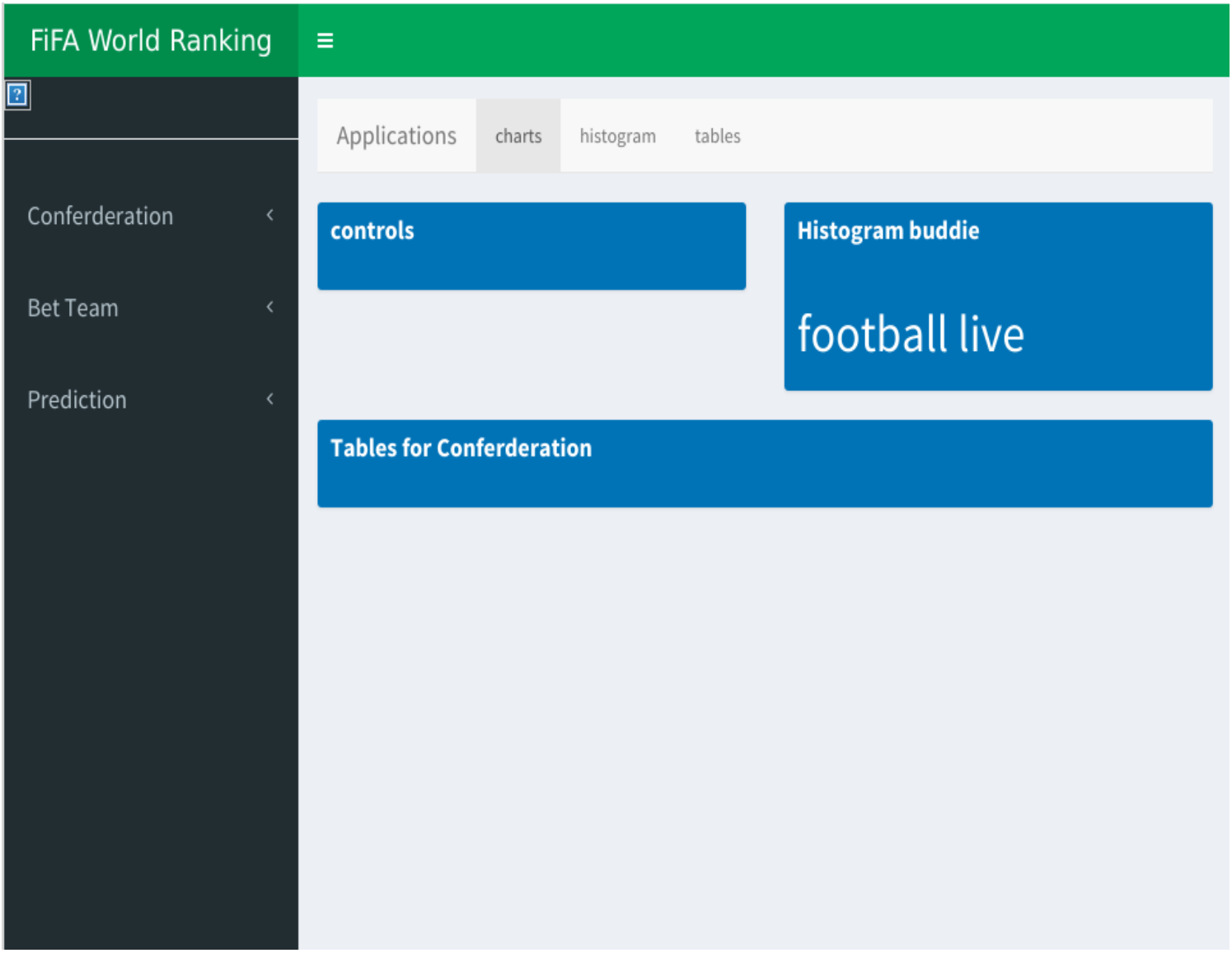
Visio studio,LibreDraw for drawing diagrams.

5 COMPONENT DESCRIPTION

5.1 USER INTERFACE COMPONENT

The user interface component diagram

Figure 1.5 shows the user interface components and the interaction with the system.



5.1.1 Type

Non executable component and its web based ,an html document

5.1.2 Purpose

The user web pages are used to display the information ,the rankings table and graphs ,visualized data .

5.1.3 Function

The web pages Acts as an output interface of the rankings and the analysis to the user of the system ‘s data .

5.1.4 Interfaces

The web pages shall display whatever is analysed in the back door of the system. And the interfaces consists of the pages with visualised data in form of graphical analysis ,bar plots and many others.

5.1.5 Resources

The user pages need the browsers to be loaded to the users and display the information the user needs .

5.1.6 References

[1] software requirements specification document SRS,describes the this component explicitly version 1

5.1.7 Processing

We shall use R to create the system .

Pseudo code for user component :

Open web page in browser

write the name of the web site

send a request to the shiny server

check for the rankings

end browsing

close browser

5.2 RANKING COMPONENTS

This component computes the total points of a team and ranks the best through the shiny server as html documents and displays them back to the client or the user as response.

5.2.1 Type

Its non executable hence automatically does the computation of the points and plots graphs for the data from a csv file .

5.2.2 Purpose

This does all the rankings and tabling of the teams and their points ,this is done both separately in confederations and generalised as the whole world .

5.2.3 Function

The ranking component is responsible for all the major functionality of the system to analyse the data in the csv and display graphs ,tables ,and bar plots through the shiny package as html documents which are viewed by the users .

5.2.4 Interfaces

The ranking component has the rankings interface , and the interface from which it gets the datasets from a csv file with which it works on.

5.2.5 Resources

The csv file containing the datasets is the major resource in this use case and the shiny server for hosting the application is also a resource needed for the system to operate well.

5.2.6 References

[1] software requirements specification document SRS,describes the this component explicitly version 1

5.2.7 Processing

Pseudo code for Ranking module:

Load the csv file containing the datasets

rank the teams

load the shiny package to display the results in the html file

load the shiny server to display the html file in the browser
if rankings viewed and browsing is finished
end browsing
close and stop shiny server

The diagram below is an activity diagram to the process of interacting with the system by the user

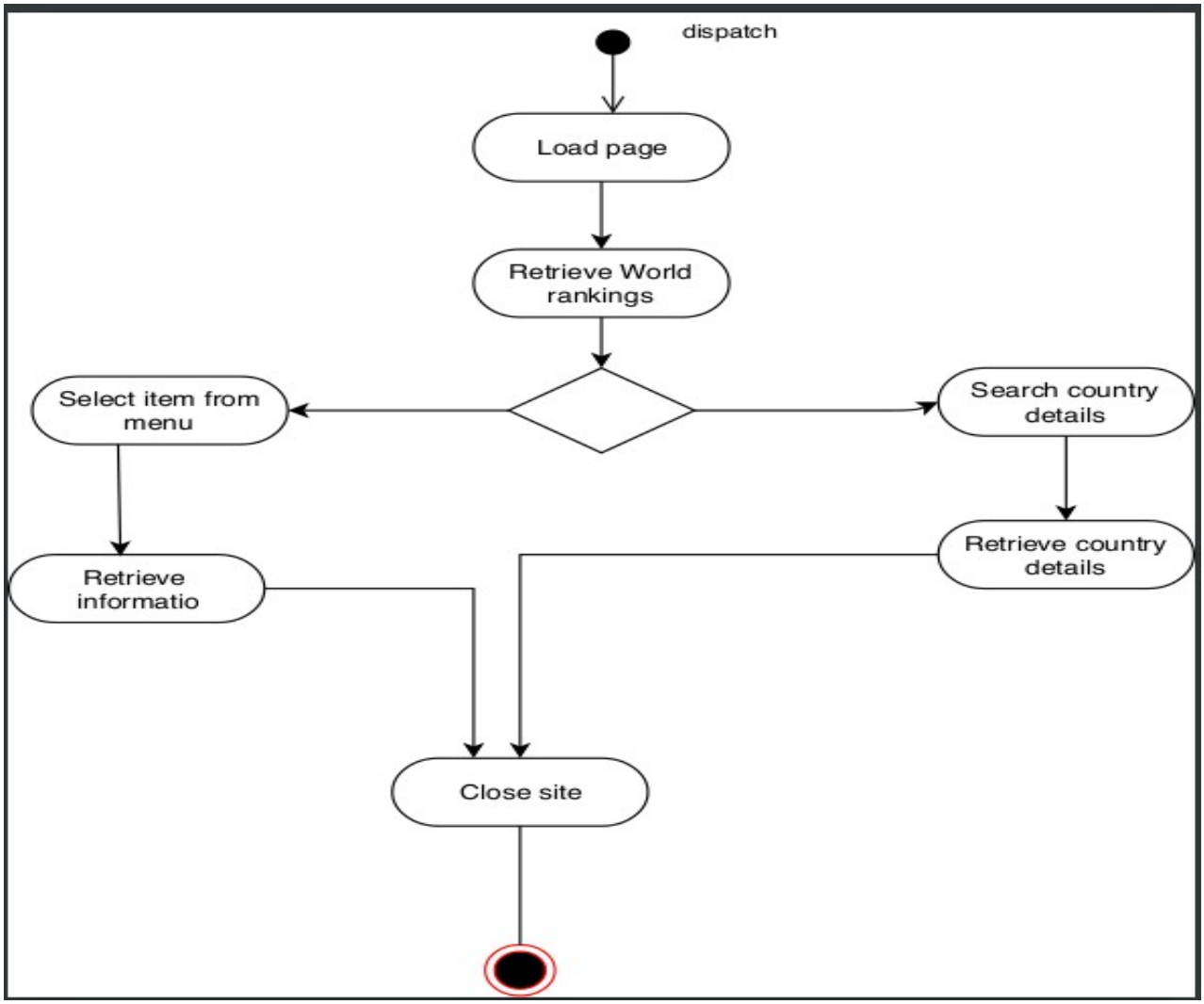


Figure 1.7 shows the activity diagram for user interaction with the system.

6 SOFTWARE REQUIREMENTS TRACEABILITY MATRIX

REQUIREMENTS	Calculate total points	Ranking of teams and countries	View countries and teams performance
User classes	X	X	X