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MAKERERE****UNIVERSITY

**COLLEGE OF COMPUTING AND INFORMATION SCIENCES.**

**BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING**

**DEPARTMENT OF NETWORKS**

**SOFTWARE DESIGN DOCUMENT SUBMITTED IN PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE RECESS SEMESTER 2018**

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1. **Introduction**
   1. Purpose

This Software Design Document is a written description of the World Cup Analyzer that will give the development team (Group-6) overall guidance to the architecture of the project. It is detailed with narrative and graphical documentation including feature specifications to the smaller pieces.

* 1. Scope

The World Cup Analyzer is intended for all users interested in having insight on the World Cup tournament.

The software is available to be accessed via a website and can also be accessed by developers who wish to contribute or test via Github. No log in is required via the website. A user simply enters their team into a form and submits it after which information on how far the team can advance in the World Cup is returned. A user can also select a set of teams for seeding. When then selection is submitted, groups of teams according to the FIFA Rankings are returned.

The software, therefore, aims to determine the effectiveness of using FIFA Rankings of men’s national football teams in determining the results of the World Cup tournament through these functionalities.

However, it should be noted that using only the FIFA Rankings cannot possibly be as effective as it would have been had we taken into consideration other factors like strength of players, funding of individual teams, etc. which, at this point, we do not have the capacity to do.

* 1. Definitions, Acronyms and Abbreviations

World Cup Analyzer – this is the name given to the software we are developing.

FIFA – Federation Internationale de Football Association is the sports global governing body.

World Cup – officially known as the FIFA World Cup is an international association football competition for men’s national football teams of members of the FIFA. It is awarded every four years.

FIFA Rankings – officially known as the FIFA World Ranking, this is a ranking system for men’s national football teams of FIFA member states.

* 1. References

Concept Paper

This document proposes the idea of analyzing the FIFA world rankings to determine their effectiveness in predicting the eventual result of the tournament.

Author: Group-6

Version number: 2.0

Date: 24th June 2018

Location: ###

Software Requirements Specifications document

This document gives a detailed description of the requirements and functionalities of the **World Cup Analyzer**.

Author: Group-6

Date: 25th June 2018

Location: ####

* 1. Overview

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

• Section 2 provides a system overview. This describes the system characteristics, system architecture, and infrastructure 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.

• Section 6 includes the Requirements Traceability Matrix

1. **System Overview**

The World Cup Analyzer is a statistical model for determining the effectiveness of using the FIFA Rankings in predicting the results of the World Cup tournament. It is designed based on R programming language and it allows a user to enter a team and be able to find out how far it can go in the World Cup. It also enables the users select a set of teams and have them put into groups according to their FIFA Rankings (seeding).

* 1. System Characteristics

The World Cup Analyzer operates in bursts, that is to say when a user submits the team or set of teams via the website, they have to wait for the information (prediction of how far it can go or seeded groups respectively) to be returned. The software is highly resilient and works even with errors. It can work with many users. The software is very secure because no user data is collected. All a user does is fill in a form on website with a team or set of teams. It is also highly scalable and is available on Github for any developer who has ideas to expand it. There are no special backup facilities needed since the project is safe on Github and can be accessed any time in case the website crashes.

* 1. System Architecture

The software will be accessed using basic two-tier client-server architecture. The client, a web browser will send a request to the web server after a user has submitted it via the form on the website, that will host our R program and will be able to return what is requested. The web browser can be accessed remotely on any user’s computer with an internet connection.

* 1. Infrastructure Services

1. **System Context**
2. **System Design**
   1. Design Method and Standards

The design method used is the Model View Controller. Model View Controller is a software architecture – the structure of the system – that separates domain/application/business (whatever you prefer) logic from the rest of the user interface. It does this by separating the application into three parts: the model, the view and the controller.

The model manages fundamental behaviours and data of the application. It can respond to requests for information, respond to instructions to change the state of its information, and even to notify observers in event-driven systems when information changes. This could be a database, or any number of data structures or storage systems. In short, it is the data and the data-management of the application.

The view effectively provides the user interface element of the application. It’ll render data from the model into a form that is suitable for the user interface.

The controller receives user input and makes calls to model objects and the view to perform appropriate actions.

* 1. Documentation Standards
  2. Naming Conventions

|  |  |  |
| --- | --- | --- |
| Element | Text | Explanation |
| Title | World Cup Analyser | This title clearly explains what our program undertakes i.e. analysing the World Cup Tournament. By this users can easily find and access it. |
| Version | V01 | This is the first version of this document and the software. |
| Date | 2018-04-07 | Date of release of this document. |
| Creator/Author | Group-6 | This group, Group-6 created this document and is creating the software as well. |
| Extension | .R  .csv | This is the file extension for program files written in the R programming language which is the language in which our program is written.  This is the file extension for spread sheet files. The dataset to be worked with is a spread sheet file. |

* Dataset\_name$variable\_name; this is the format for writing variables in the R programming language.
* Comments are written with the # symbol preceding a statement meant to be a comment.
  1. Programming Standards

The program has three modules; team seeding, team performance evaluation and factor evaluation.

Each module is mapped upon the program’s core functions.

Commenting in the program will mainly be done on the functions in the language.

Indentation in RStudio will be left-aligned throughout most of the program and will only change when dealing with many function arguments. The program will begin with importing the dataset to work with and then the program modules as described above will follow. Within the HTML code, our program code will be indented in the <body> tags.

Our program will comprise of various functions in R such as the require function to call on the data, function arguments, dataset variables.

* 1. Software Development Tools

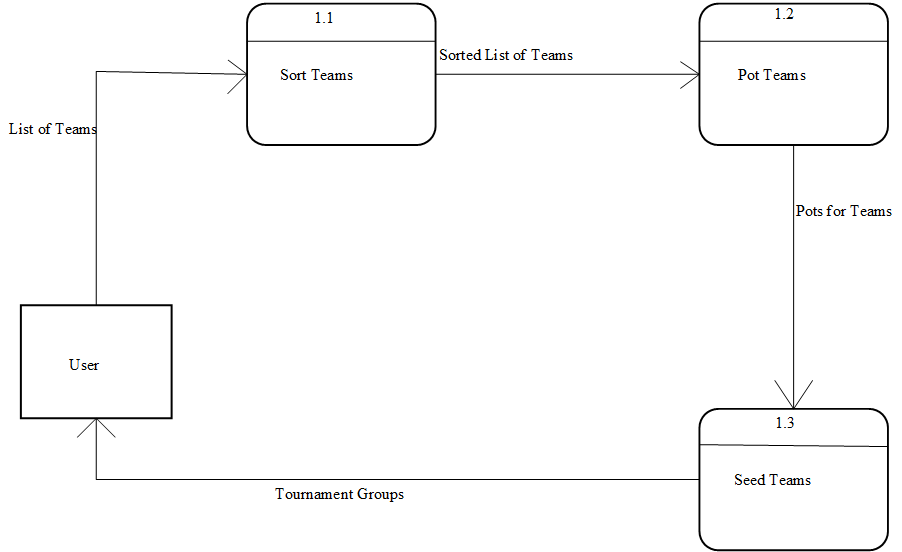
The Software Development tools used are;

• RStudio

* 1. Outstanding Issues
  2. Decomposition Description

1. **Component Description**

LEVEL 1 DIAGRAM FOR SEEDING TEAMS



LEVEL 1 DIAGRAM FOR TEAM PERFORMANCE EVALUATION

