**CST-217 Functional Requirements Document Template**

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* **Kyungchan Im (Team Leader / QM):** 
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  + Responsible for Methodology, Functional Requirements and Qualifying the Document
  + Research on user interaction question about the UEFA database
  + Responsible for gathering, analyzing and documenting requirements for the project.
* **Levi Guerengomba (Development Manager / QM):** 
  + Responsible for Introduction and Qualifying the Document
  + Research resources for project
  + Responsible for overseeing the development and implementation of the project.

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# 1 INTRODUCTION

# The UEFA1 Prediction Database Project aims to predict which teams from Europe’s premier soccer leagues will qualify for the UEFA Champions League. This Functional Requirement Documentation (FRD) provides a comprehensive overview of the project, including its purpose, scope, background, references, assumptions, constraints, and methodology. The project will involve collecting and analyzing various data sets related to team history, team chemistry, match history, player statistics, and game statistics, with the English Premier League (EPL) serving as the model for the project.

## 1.1 Purpose

# The purpose of this Functional Requirement Documentation (FRD) is to provide a comprehensive overview of a database project aimed at predicting the outcome of who is going to qualify for the Union of European Football Association (UEFA) from Europe’s premier soccer leagues. The project will involve collecting and analyzing various data sets related to team history, team chemistry, match history, player statistics, and game statistics.

## 1.2 Scope

# This document presents a comprehensive plan for the UEFA Prediction Database Project, which seeks to determine the teams that will qualify for the prestigious UEFA Champions League. The project is set to encompass a vast scope, as it requires data aggregation from 55 countries that are under the umbrella of the Union of European Football Associations (UEFA). The focus of this endeavor will be placed solely on Europe's premier soccer leagues, and UEFA will play a pivotal role in helping to accurately predict the results. The English Premier League (EPL) has been selected as the model for this project due to its popularity, which is reflected in the abundance of data and statistics available. The EPL is considered a standard in the world of soccer, and its history, team dynamics, player statistics, and other relevant information will provide valuable insights for the project.

## 1.3 Background

# UEFA is responsible for overseeing all of Europe's football national teams and clubs. The organization has 55 different countries as members. The purpose of this project is to use data and statistical analysis to predict which teams from Europe’s premier soccer leagues will qualify for the UEFA Champions League. Since the Championship League is a tournament for the world best club teams, UEFA is under the documentation and rules.

## 1.4 References

# References and controlling documents that may be used in this project include match history stats, player statistics, game history, team history, team chemistry, and other statistical analysis about soccer predictions.

### 1.5 Assumptions

# This project operates under several key assumptions. One of the primary assumptions is the availability and use of specific technical tools for data storage and mining. In particular, the MySQL Workbench will be used as the platform for data storage. The Workbench is a comprehensive solution for database management and is known for its reliability and versatility. Additionally, the project will utilize Python for data mining purposes. Python is a high-level programming language that is widely used in data science and machine learning. It offers a vast array of libraries and tools that make it a suitable choice for data mining tasks. These assumptions provide a solid foundation for the project, ensuring that the data storage and mining processes are efficient and accurate.

### 1.6 Constraints

The delivery timeline for this project is a critical constraint, as the project must be completed by week 8. The technical requirements for this project include data mining, data validation, analysis, and visualization, and each of these tasks must be performed to a high standard in order to meet the overall project objectives. To ensure that the project stays on track, the tasks will be divided among individual team members and managed effectively to meet the deadline. Additionally, the project must comply with legal requirements related to UEFA and the data collection and storage process must adhere to relevant technical standards. Strategic decisions and business rules for the database must also be taken into consideration to ensure the successful delivery of the project.

## Document Overview

# This document provides an overview of the database project aimed at predicting the outcome of who is going to qualify for the UEFA Champions League from Europe’s premier soccer leagues. The document includes the purpose, scope, background, references, assumptions, constraints, and methodology of the project, as well as appendices. The data will be collected by using data mining or data scraping. This project aims to have a real world data value, and generate basic data statistics.

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# 2 METHODOLOGY

The main methodology for the functional requirements was looking at the core types of data that a player, scouter, analyst, or fan would try to obtain. UEFA is a big organization but we are generalizing it into a skimmed down structure that still holds the data that the various users will need while eliminating anything extra. The main purpose for the database will be to find statistics on players and teams so having entities like employees and invoices are unnecessary. We will be using real data scraped from UEFA so we are structuring the database around data that is accessible to the public. Also, by comparing the historical data such as a match result to evaluate our analysis.

# FUNCTIONAL REQUIREMENTS

## User Requirements

1. Players - Individual players are looking for a team that suits for his statistic.
   1. Professional England player is moving to Italy, but he is willing to go to the team that has high defensive strategy. He is looking for the team that has defense rating over 85 and within an Italy League.
   2. A player wants to see his value on the marketplace. He is looking for the other player’s value that is similar with his performance.
   3. A highly rated forward from Germany is seeking a club with an offensive rate above 85%, while evaluating their market value by comparing their stats, such as goals and assists, to similarly skilled players
2. Scouters - Scouters look for the specific position for the players to build strong team chemistry
   1. Manchester United team is weak in defensive line. They are looking for a Defensive Centerback with personal statistic rates over 85 and underage of 25.
   2. Third Party scouter has a bridge connection with a college star youth player. The scouter is looking for a team that fits for this player. The player is forward position, so he fits for a team who has under 85 rates of offense team statistic.
   3. A Club team is under a budget, but they need 2 offensive players to cover the season. They are looking for a offensive players who are under 3 million dollar each, and overall stat above 75.
3. Analyst - Analysts
   1. A marketing analyst wants to know why X match had better viewership compared to Y match. The analyst will compare the two match’s marketing budget, viewership, and tickets sold.
   2. A strategic analyst is wanting to know the how good the opposing team is. The analyst will look at the team’s offensive and defensive stats. Additionally, he might look at the team’s previous match history to find footage.
   3. A club analyst wants to win the next match opponent. He is going to look for the database and find what is the weakness of the opponent’s offensive side and defensive side
4. FANS5 - Fans search for a player stat, club stat, match history, and other information for their knowledge boundaries.
   1. A fan wants to edit his account details thats filed in his UEFA website account. He might edit his email, phone number, or address to the latest versions.
   2. An influencer wants to share the score of the latest game from X team. He will use the score and the team that won for a social media post.
   3. A fan is tracking players to add to his fantasy league. He will compare two players overall stats in order to determine which one to draft.

## Functional Requirements

1. Identifying all entity
   1. LEAGUES
      1. Name (Varchar(50) NOT NULL)
      2. Country (Varchar(30) NOT NULL)
      3. Number of teams in the league (INT NOT NULL)
   2. TEAM
      1. Name (Varchar(50) NOT NULL)
      2. Number of Players on Roster (INT NOT NULL)
      3. Value (Float)
      4. Match Total (INT NOT NULL)
      5. Won (INT NOT NULL)
      6. Draw (INT NOT NULL)
      7. Lost (INT NOT NULL)
      8. Stat\_Offense (INT)
      9. Stat\_Defense (INT)
   3. PLAYERS
      1. Name of Player (Varchar(50) NOT NULL)
      2. Club Team (Varchar(50) NOT NULL)
      3. Date of Birth (Date() NOT NULL)
      4. Position (Varchar(30) NOT NULL)
      5. Overall\_stat (INT NOT NULL)
      6. Value (Float)
   4. MATCH
      1. Team\_A (Varchar(50) NOT NULL)
      2. Team\_B (Varchar(50) NOT NULL)
      3. Who\_won (Varchar(50) NOT NULL)
      4. Who\_lost (Varchar(50) NOT NULL)
      5. Score (INT NOT NULL)
      6. Date (Date() NOT NULL)
      7. Marketing Budget (Float)
      8. Viewership (INT)
      9. Ticket sold (Float)
   5. COACH
      1. Name of the Coach (Varchar(50) NOT NULL)
      2. Club Team (Varchar(50) NOT NULL)
   6. FANS
      1. First Name (Varchar(50) NOT NULL)
      2. Last Name (Varchar(50) NOT NULL)
      3. Favorite Team (Varchar(50))
      4. Phone (Varchar(50) NOT NULL)
      5. Email (Varchar(50))
      6. Address (Varchar(100))

**Relationships**

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|  |  |
| A league is composed with many club teams | A club team must involve in only one league |
| A club team has many players | A player can have only one team |
| A club team is scheduled to play many matches | A match must be done with two teams |
| A club team can have one coach | A coach can coaching only one team |
| A club team can have many fans | A fan can have one favorite team |

## Hardware/Software Requirements

The software platforms necessary to support the UEFA prediction database project include a MySQL server, MySQL workbench, Python, and Excel. These tools will enable efficient storage and processing of data collected for the project, as well as enable data mining, validation, analysis, and visualization. The use of a database management system in the form of a MySQL server and workbench will ensure the integration and manipulation of data, while Python will provide the necessary tools for data mining and analysis. Excel, on the other hand, will provide a convenient platform for data visualization and reporting.

# Appendices

1. [UEFA](https://www.uefa.com/uefachampionsleague/statistics/clubs/)
2. [Team Lake - Organization Profile](https://docs.google.com/document/d/1bSw4APs8mVuNzInpNVWKb2DtiflrXetx/edit)
3. [Python Documentation](https://docs.python.org/3/)
4. [MySQL Documentation](https://dev.mysql.com/doc/)
5. [ESPN Database](https://www.espn.com/soccer/stats/_/league/eng.2)

**Comments**

Kyungchan Im/Chris (Team Leader) - The document is revised and reviewed several time. Each individual idea was implemented and did hard work on the brainstorm.

Aaron Galicia (Requirement Manager) - The document is well defined and includes all of the required sections needed for this FRD.

Levi Guerengomba (Development Manager) - The documentation represents the guide for the user and the purpose for business plan. It is well revised and provide straightforward information.