

**KTO KARATAY UNIVERSITY**

**FACULTY OF ENGINEERING AND NATURAL SCIENCES**

**DEPARTMENT OF COMPUTER ENGINEERING**

**CLUB MANAGEMENT SYSTEM REPORT**

**Project Name:** Club Management System with Data Science

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# CHAPTER ONE

## INTRODUCTION

Nowadays, innovative projects that lead to revolutionary changes not only on the pitch but also in club management are becoming increasingly important. In this context, we decided to develop a soccer club management system that focuses not only on traditional methods but also on machine learning based solutions.

This project stands out by integrating machine learning models using a range of comprehensive data sets, from the players to the overall performance of the team. Taking a beyond the ordinary approach, we have created a system that can predict the price of players and identify the most suitable positions. We have also developed a system that can identify the most successful starting 11 based on the overall performance of the players using the player dataset within the team.

The main goal of our project is not only to optimize the on-field strategy, but also to contribute to the evolution of club management to a data-driven and future-oriented perspective. In this project, which we completed after 14 weeks of intensive work with our teammates, we have created an infrastructure that is open to development and can integrate new machine learning models.

## Background Data Driven Football Club Management

Emerging technology and advances in data science have led to a series of innovative applications affecting sports management. In this context, football clubs are increasingly turning to data-driven solutions to improve their performance and optimize their strategic decisions. In line with this trend, our project has been developed with the aim of taking football club management beyond traditional boundaries.

Today, a wide range of data is available, from the players to the overall performance of the team. However, effectively analyzing and using this data requires an advanced information processing infrastructure and the integration of machine learning models. Our project is designed to overcome these challenges and provide football clubs with a smarter and data-driven management system.

Moreover, with increasing competition in the football world, clubs need to gain an advantage not only on the pitch but also in the transfer market. At this point, machine learning-based price prediction models and player position predictions are becoming important tools to support clubs' strategic transfer decisions.

The background of our project reflects the emergence of a football club management system designed around the integration of data science and machine learning, in line with the increasingly complex dynamics of football.

## Problem Analysis/Declaration: Challenges in Football Club Management

The problem analysis underpinning our project focuses on the current challenges in football club management. These challenges include areas that cannot be overcome by traditional management approaches and where data-driven solutions are needed. Here are the key points from which our project emerged to provide solutions to these challenges:

Data Stack Complexity: Football clubs have a large and complex mass of data such as players' performance, transfer data, injury history. Traditional management systems are unable to effectively analyze and translate this abundance of data into strategic decisions.

Uncertainty of Transfer Strategies: The transfer market is an environment characterized by uncertainty and rapid change. Clubs have difficulty in determining the right transfer strategies and often rely on subjective assessments when making these decisions.

Uncertainty in Player Position Prediction: It can be difficult to determine the most effective positions of players using traditional methods. This can limit proper placement and tactical flexibility within the team.

The Need for Big Data Analysis: Big data analysis is inevitable for an advanced soccer club management system. However, performing this data analysis manually is a time-consuming and error-prone process.

Our project aims to provide a more data-driven, strategic and effective management approach to football clubs by providing solutions to the challenges mentioned above.