# CHAPTER ONE

**INTRODUCTION**

## BACKGROUND OF STUDY

The world of professional sports has evolved into a significant economic industry, with financial flows on par with many other national industries. Nowadays, sports organizations are not just viewed as entities that solve tournament-related tasks, but also as potential investment opportunities. Hence, it's crucial to have accurate analyses of these organizations' activities to enhance their investment attractiveness and to provide potential investors with reliable financial prospects for establishing long-term economic partnerships. Sports managers are responsible for achieving growth in investment attractiveness, while potential investors seek trustworthy assessments of sports organizations (Kulikova & Goshunova, 2016).

Football has a significant impact on people's daily lives and has become the most popular sport globally, making it an emerging industry. As it encompasses multiple departments and activities, it is considered an economic sector where Information Systems should be implemented (Al-Asadi & Tasdemir, 2019). It is evident that sports involve physical activity and technology has limited ability to alter or simplify this aspect. Nonetheless, computers can be utilized in various ways to assist athletes in achieving success, (Clunk, 2021) like storing statistical data in a database which can be retrieved in anytime and anywhere in the world.

Livescore management system is a software application that is used to manage and display real-time updates and scores of ongoing matches for various sports. This system will be used to manage football competition in Kaduna Polytechnic. The system will be able to show fixtures between each department, summary of games, team information, news up date and the scoreboard.

## STATEMENT OF THE PROBLEM

Currently, Kaduna Polytechnic’s sport sector are using filing method to store and manage all the information throughout the tournament periods. However, this traditional approach poses several challenges for staff to handle all the data. Searching for a specific document can be time-consuming and the papers may deteriorate with frequent use. Also, some students do miss to see their department’s matches due to several reasons like they are out of the school compound or occupied with other school activities.

## AIM AND OBJECTIVES

The aim of this research is to develop a web-based livescore management system which will enhance the method of keeping football tournament records and also displaying summary of games played, the objectives are as follows:

1. Examine and understand the existing system.
2. Design and develop a web-based system that will keep summary of games played
3. To Test the efficiency of the system.

## SCOPE OF THE PROJECT

This project is to work is to develop a web-based system which can be used by anytime, anywhere but mostly the students of Kaduna Polytechnic. The system consists of two users; The Admin and The Students. The students are only liable to see the summary of games played in each departments, the scoreboard and fixtures while the Admin is responsible for uploading fixtures, updating scoreboard

## LIMITATION OF THE STUDY

The project work is limited to only tournaments played in Kaduna Polytechnic, the system won’t provide live streams of ongoing matches; only the scoreboard, summary of games and fixtures.

## SIGNIFICANCE OF THE STUDY

The research work will be of importance to:

1. The students of Kaduna Polytechnic: It will help them follow up on matches they miss, they will also be aware of details of the upcoming matches.
2. The school Management: The system will help them have proper records on tournaments played in the school

## PROJECT ORGANIZATION

The project is divided into five chapters. Which are listed below:

**Chapter One: Introduction**

This project work, the study's background, the problem statement, the aim and objectives, the study's scope, its importance, how the study was organized, and definition of terms.

**Chapter Two: Literature Review**

This chapter focuses on a survey of the literature; the contributions of other academics to the field are also included.

**Chapter Three: System Methodology and Design**

System methodology and design are the topics of this chapter. This chapter describes the research methodology used to design the system, System modelling, input and output interface design, and database design are all included. The system requirements and used programming languages are also covered in this chapter.

**Chapter Four: System Implementation and Evaluation**

This chapter describes the system testing and evaluation and also sample outputs.

**Chapter Five: Summary, Conclusion and Recommendation**

This is the last chapter of the research work, it briefly describes the work done so far, with a conclusion and suggestions.

## DEFINITION OF TERMS

1. Scoreboard: A visual display board that shows the current scores and other information related to a particular match or game.
2. Fixture: The schedule of upcoming matches or games in a particular sports league or tournament.
3. Goal: A point scored by a team in sports like soccer, hockey, and basketball.
4. Point: A unit of scoring in various sports such as tennis, badminton, and volleyball.
5. Half-time: The break in between two halves of a game or match.
6. Full-time: The end of a game or match, after all the scheduled time has been played.
7. Overtime: Extra time played in a game or match when the score is tied at the end of the regulation time.
8. Penalty shootout: A tie-breaker mechanism used in sports like soccer, where each team takes turns to take penalty kicks, with the team scoring more goals being declared the winner.
9. Referee: An official responsible for enforcing the rules of the game and ensuring fair play.
10. Red/yellow card: A warning or punishment given to a player by the referee for breaking the rules of the game, with a red card typically resulting in a player being sent off the field.

# **CHAPTER** TWO

**LITERATURE REVIEW**

## INTRODUCTION

This chapter reviews what other researchers have contributed relating to the proposed system, the important role of information technology in the field of physical education and sports, Benefits of ICT in Sports Development and brief on Livescore Management System.

## Important Role of Information Technology in the Field of Physical Education and Sports

The emergence of information technology has caused significant transformations, posing challenges on the organizational structure and operations of various sectors, including sports organizations. However, information technology is a dynamic field that constantly introduces new solutions, overcomes limitations, opens up new possibilities, and enriches our way of life with a comprehensive set of tools, methods, and infrastructures for creating, collecting, storing, processing, and communicating data (L. Ibrahim, 2017).

Singh et al. (2019) wrote that the role of information technology in sports and games is crucial as it helps prevent errors in the organization and administration of various sports events at the global level. The use of information technology in sports has led to the establishment of scientific disciplines, research activities, and improved learning and coaching. Additionally, bio-mechanical analysis and field research have also been developed. In the future, computers are expected to be increasingly applied to sports, resulting in better outcomes. Information technology provides access to information, compresses data, and motivates and connects learners to teachers and colleagues. Today, there are many technological innovations available that can be incorporated into physical education lessons. The use of a connected learning environment, which is based on technology that is networked in structure, can make physical education lessons more engaging and realistic. Therefore, physical education teachers should take advantage of these technological opportunities to make their lessons more dynamic and effective.

## Benefits of ICT in Sports Development

According to Tyoakaa (2021), Information Communication Technology can be beneficial to sports development in the following ways:

**Database Management**: The capability to document modifications in sports and analyze and rectify them is crucial for the continued existence of sports management on a worldwide scale. This can be made possible, competently and proficiently, by implementing information and communication technology (ICT). By utilizing a database, performance can be monitored, and sports administrators can trace the evolution of sports over many years. In the last 20 years, numerous technological advancements have provided the ability to gain deeper insight into individual athletes and teams during competitions.

1. **Review of Training Strategies:** ICT can be helpful in sports development by enabling the evaluation of training and practice sessions for the purpose of observing progress and identifying areas that need improvement. Iheanacho et al. (2013) stated that the process of creating and utilizing videos is a significant element of professional sports. It was also mentioned that a football coach has the ability to analyze game footage to identify ways to enhance their offensive passing/attack and refine their overall strategy.
2. **Accessibility to Sports Equipment and Facilities:** Underscoring the significance of equipment and facilities to sports development, it is worth noting that the majority of these resources are manufactured in the more developed countries. In past times, athletes from less developed regions faced challenges in accessing information about the availability and proper utilization of these items for advancing their athletic endeavors. Lately, there has been increased availability of information related to sports equipment and facilities, including details on their availability, usage instructions, and associated expenses. Social media has played a major role in making this information easily accessible to people at a reduced cost.
3. **Simulation and Games:** The goal of using simulation and virtual environments is to assist in training by providing an additional training setting. This setting can be particularly helpful for individuals who require extra practice or those who are unable to participate in full training due to injuries. Such environments can enhance perceptual cognitive and perceptual motor skills. Various tools such as video-based decision making tools, virtual reality environments, and simulated batting environments are utilized for this purpose.
4. **Application of Intelligent Management System:** The use of ICT is not limited to specific fields as it can also be employed in various areas of application development. An example of this is the work of Can, Lu, and Gan (2011) who suggest that computer software programming and multimedia IT can be utilized to automate fitness and recreation sports management, as well as establish health management and office automation systems.

## Livescore Management System

A livescore management system is a software application that helps sports organizations and websites to collect, manage, and display real-time scores and updates of various sporting events. It typically involves the integration of data from multiple sources, including official sources, user-generated content, and third-party feeds.

One of the key features of a livescore management system is the ability to provide real-time updates and alerts to users. This can be done through various channels such as websites, mobile applications, social media, and SMS messages. The system should also have the capability to handle large volumes of traffic and be able to scale up or down depending on the demand.

Another important aspect of a livescore management system is the ability to ensure accuracy and reliability of the data. This involves implementing data validation and verification processes to minimize errors and inconsistencies. The system should also have the capability to handle data from multiple time zones and languages.

Security is also a critical consideration when it comes to a livescore management system. It should have robust security features to protect against unauthorized access, data breaches, and cyberattacks. This may include implementing encryption, firewalls, and other security measures.

Overall, a well-designed and implemented livescore management system can help sports organizations and websites to provide timely and accurate updates to their users, improve user engagement, and enhance their overall brand reputation.

## REVIEW OF RELATED WORKS

Sumit Kumar Singh, Kumar Abhishek and Gautam Mishra (2014) proposed a system named “Automated Football Management System”. The primary objective of developing this management system is to introduce an online system that enables the management to conduct all activities in a systematic manner. Previously, the system was managed manually through an account maintenance technique, which resulted in the loss of data and security issues. To address these problems, the management has decided to develop an online system that will update all records automatically and store them safely in a database. In this system, players play a crucial role as they can register as members of the club and purchase sports apparel. Players can access their profiles and view their salaries if applicable. The system was developed using Visual Studio 2010, Microsoft SQL Server, and Microsoft Office Visio. Its frontend was coded in ASP.NET.

Shahzaib Ibrahim and Muneeb Ur Rehman (2017) developed a system; World Soccer League Management. The motivation behind this project is the realization that numerous football enthusiasts are unable to watch their preferred team's matches due to various reasons such as socializing with friends or being occupied elsewhere. Thus, the researchers developed software that allows fans to access game summaries. They can obtain information about player and team statistics, league rankings, and points tables, among other things. jFrame programming language was used to develop its frontend while Java, SQL were used for Backend.

Kaira Stephen (2019) developed Football Management System. This project aims to provide various solutions that will allow users to interact with the club's database through a user-friendly interface provided by the system. With the system, Fans have access to the website via their phones or computers from the comfort of their homes or offices at any time. The system was able to manage the player's background and information on the site, and users who access the intranet will also be managed. Team leaders were able to access to update their information on the site to keep fans informed of their team news. The system manages the season teams and categories, create teams, or update existing information. It schedules teams' matches and game time and update data through the internet. Users are able to track their player's movements, read highlights of the games played, and view information about their favorite team or players. Coaches of each team are able to post the players' assistance and give immediate feedback to families if needed. The system’s frontend was designed with HTML, and CSS while PHP was used for the backend.

Belitsoft Software Company designed and developed Custom C# Desktop Application Development for a Football Federation. The system consists of several functional modules including players, stadiums, clubs and combined teams, transfers, referees, inspectors, match delegates, and competitions. The players module tracks registration and changes of information about all football players and stores players’ bio, transfers, game statistics, disciplinary penalties, automated eligibility, and other details. The stadiums module has all information about football infrastructure in the country and its current use for different events and for clubs’ routine activities. The clubs and combined teams module shows all clubs, football schools, and combined team information including all game statistics by club. The transfers module tracks players’ transfers both home and international following all FIFA and UEFA standards and allows forming teams and tracking transfers of players. The referees, inspectors, match delegates module follows registration and changes of personal data of referees, inspectors, and match delegates for each game and creates match reports highlighting both game progress and cases of the rules violation which are punished with penalties. Finally, the competitions module displays all competitions added to the repository and uses data from all other modules to create the calendar of games, including Berger’s table pattern. It also sends automated notifications to all game participants and notifies if a player is suspended from a game or competition as penalties or other restrictions are added into the system for this player. C#, .NET and PHP were used to develop the system.

Live Score Application Development for Flag Football Based on Android was developed by Andrean Febry Ramadhan, and Taryana Suryana (2022). The built application includes statistical data collection for each player competing. The methods used for processing the statistical data is SAW (Simple Additive Weighting) method. This system uses the Waterfall software development model.The tools used in the preparation analysis is Unified Modeling Language (UML).The testing of the football flag application uses blackbox and direct observation of the ongoing flag football match. The system was develop with Android Studio, Java been the frontend while PHP for the backend.

Yang Sun and Changjun Hu (2022) designed and implemented A Football Player Training Management System Based on Intelligent Image. This article was aimed at studying the design and implementation of a football player training management system based on smart images. The system’s architecture and the detailed design of each functional module of the system includes football player information management module, football player training plan viewing module, training goal formulation module and training information feedback module. The realization of the training management system relies on intelligent image technology to detect and track athletes. Finally, the performance of the system was tested. The test results show that the expected response time of each module of the system when different numbers of users are accessed is within 3 seconds. The longest actual time is 2.64 s, and the actual shortest time is 1.18 s. It can be seen that the response time of the system meets the demand. At the same time, the system throughput rate meets the requirements of this article, and the user pass rate is also above 95%, indicating that the performance of the football player training management system designed in this article is better.

**CHAPTER THREE**

**METHODOLOGY AND DESIGN**

## INTRODUCTION

A research study's methodology and design are crucial elements because they dictate how the study will be carried out and how the data will be gathered and analyzed. The system modeling for this system is covered in this chapter, along with the database design, output design, input design, user interface design, and system requirements.

## METHOD OF DATA COLLECTION

In this project, data was gathered from various sources for the research work. Two main techniques were used for collecting the necessary data and information from the system analyses:

## SYSTEM MODELLING

This is the procedure for modeling a system using a variety of tools and methods. There are various graphical notations that can be used to depict the system. (UML). The Use Case Diagram, Class Diagram, and Activity Diagram are a few examples of the unified modeling language utilized in this system.

### USE CASE DIAGRAM

A use case is a particular way to employ a system functionality. Each use case includes a detailed description of the interaction between an actor and the system as well as the entire sequence of action that the actor initiated. The interaction between the students, record officers, and student affairs section is shown in the use case.

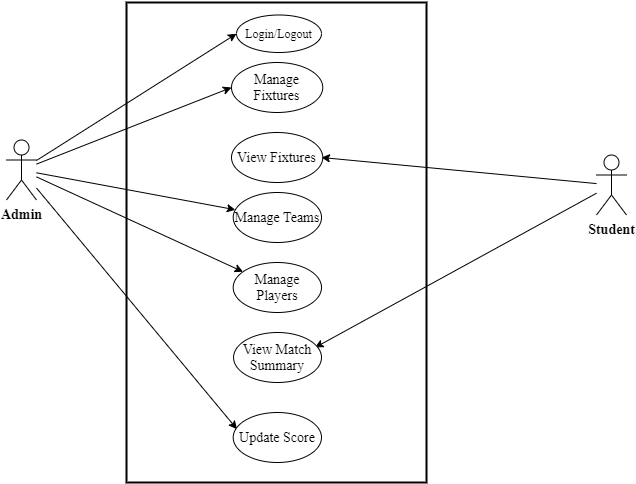


Fig. 3.1: Use-Case Diagram

### CLASS DIAGRAM

A class diagram in the Unified Modelling Language is a sort of static structure that shows the classes, properties, operations, and relationships of a system to show how it is organized. Below is a diagram of this system class

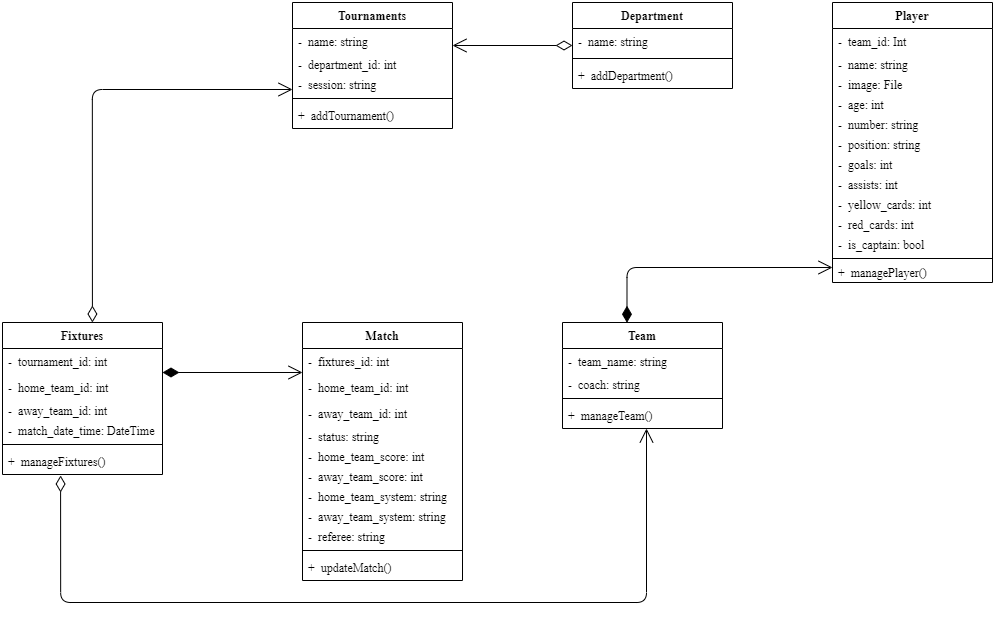


Fig. 3.2: Class Diagram

### ACTIVITY DIAGRAM

An activity diagram is comparable to a flowchart in that it illustrates the sequence of actions or control flow within a system.

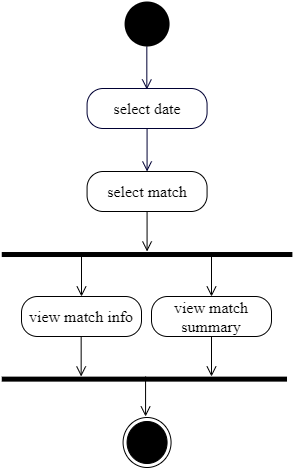


Fig. 3.3.1: Student Activity

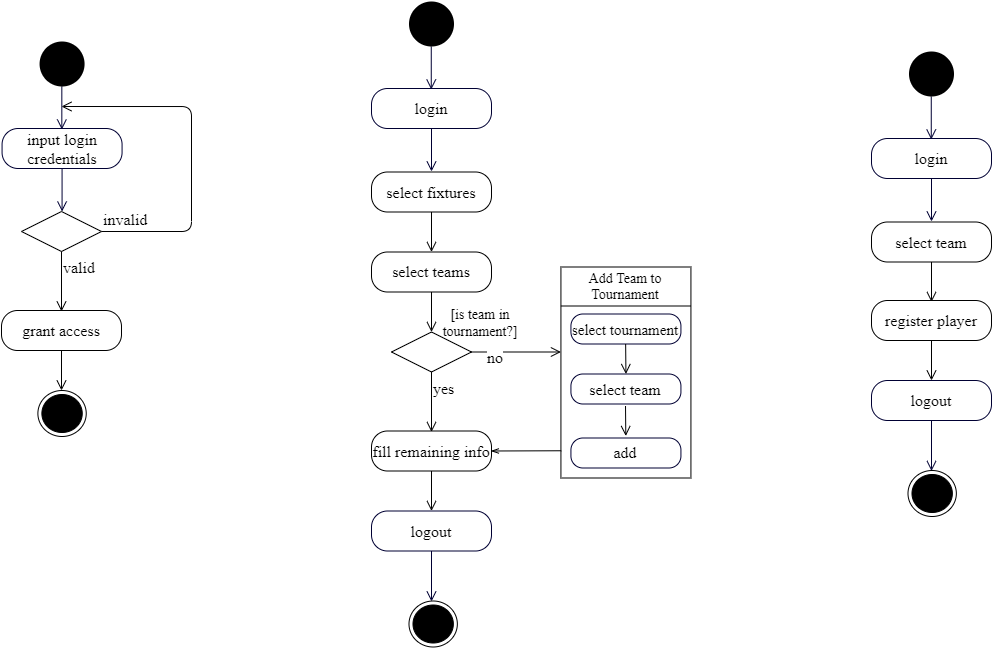


Fig. 3.3.4: Register Player

Fig. 3.3.2: Admin Login

Fig. 3.3.3: Add Fixtures

## DATABASE DESIGN

SQLite is the selected database for the system's backend. It is a C programming library that functions as a relational database management system. Its database design operates in a similar manner to other RDBMS, where you establish a schema that outlines the tables, columns, and data types within the database. The data tables in the database have the following structure:

* Fixtures
* Match
* Player
* Tournaments
* Teams
* Line-Up

Table 3.1: Fixtures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FIELD NAME** | **DATA TYPE** | **LENGTH** | **KEY** | **DESCRIPTION** |
| tournament\_id | int | 10 | pk | Unique id for each tournament |
| home\_team\_id | int | 10 | fk | Unique id for identifying home team |
| away\_team\_id | int | 10 | fk | Unique id for identifying away team |
| match\_date\_time | DateTime | - |  | Date and time of the match |

Table 3.2: Match

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FIELD NAME** | **DATA TYPE** | **LENGTH** | **KEY** | **DESCRIPTION** |
| fixtures\_id | int | 10 | pk | Unique id for each tournament |
| home\_team\_id | int | 10 | fk | Unique id for identifying home team |
| away\_team\_id | int | 10 | fk | Unique id for identifying away team |
| status | String | 5 |  | The current status of the match |
| home\_team\_score | int | 2 |  | The score of the home team |
| away\_team\_score | int | 2 |  | The score of the away team |
| home\_team\_system | String | 7 |  | The formation of the home team |
| away\_team\_system | String | 7 |  | The formation of the away team |
| referee | string |  |  | The match referee |

Table 3.3: Player

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FIELD NAME** | **DATA TYPE** | **LENGTH** | **KEY** | **DESCRIPTION** |
| team\_id | int | 10 | primary | Unique id for identifying the team |
| name | String | 255 |  | Player name |
| image | String | 255 |  | Player’s image |
| age | int | 2 |  | Player’s age |
| number | int | 3 |  | Player’s shirt number |
| position | String | 255 |  | Player’s position on the pitch |
| goals | int | 3 |  | Number of player’s goals |
| assists | int | 3 |  | Number of player’s assists |
| yellow\_card | int | 3 |  | Number of player's yellow card |
| red\_card | int | 3 |  | Number’s of player’s red card |
| is\_captain | bool | 1 |  |  |

Table 3.4: Tournaments

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FIELD NAME** | **DATA TYPE** | **LENGTH** | **KEY** | **DESCRIPTION** |
| name | String | 255 |  | Name of the tournaments |
| department\_id | int | 10 | fk | Unique id for identifying department |
| session | String | 10 |  | The school session |

Table 3.5: Teams

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **FIELD NAME** | **DATA TYPE** | **LENGTH** | **KEY** | **DESCRIPTION** |
| name | String | 255 |  | Name of the tournaments |
| coach | String | 255 |  | The manager of the team |

## OUTPUT DESIGN

The system was created to provide the user with quick and organized output. The output is available on web pages with various formats, and can be accessed through the following page modules:

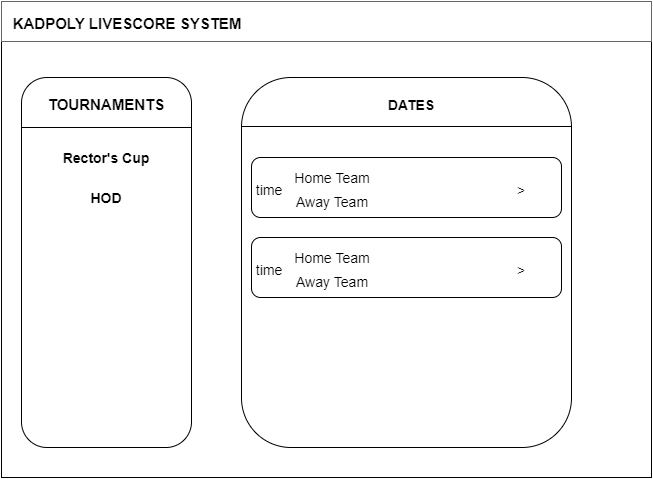


Fig. 3.5.1: Index Page

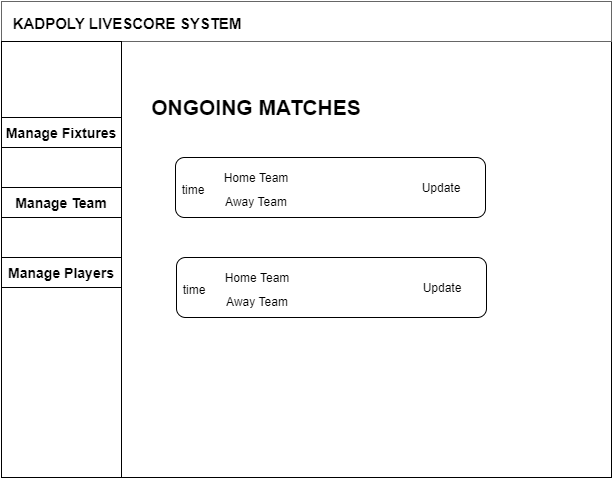


Fig. 3.5.2: Admin Dashboard

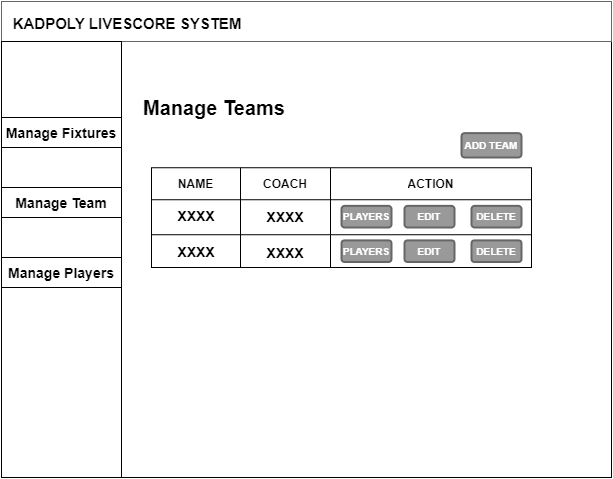


Fig. 3.5.3: Team Managing

## INPUT & USER INTERFACE DESIGN

Efficient data collection is a core aspect of the system's design, which is achieved through user input forms and clicks. As users input data or make selections, the system captures and forwards the information to designated modules for processing. The processed data is then sent to the backend of the system for additional processing. Here are some of the input forms included in the system:

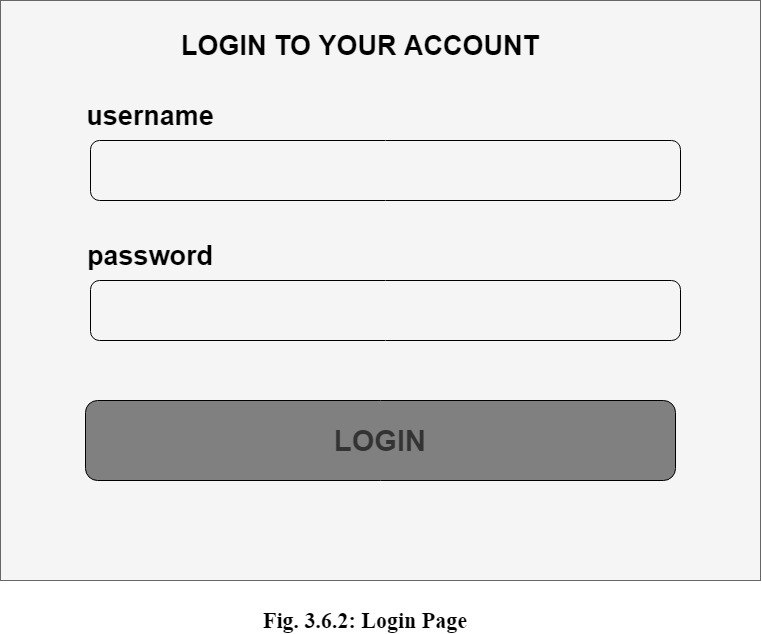


Fig. 3.6.1: Admin Login Page

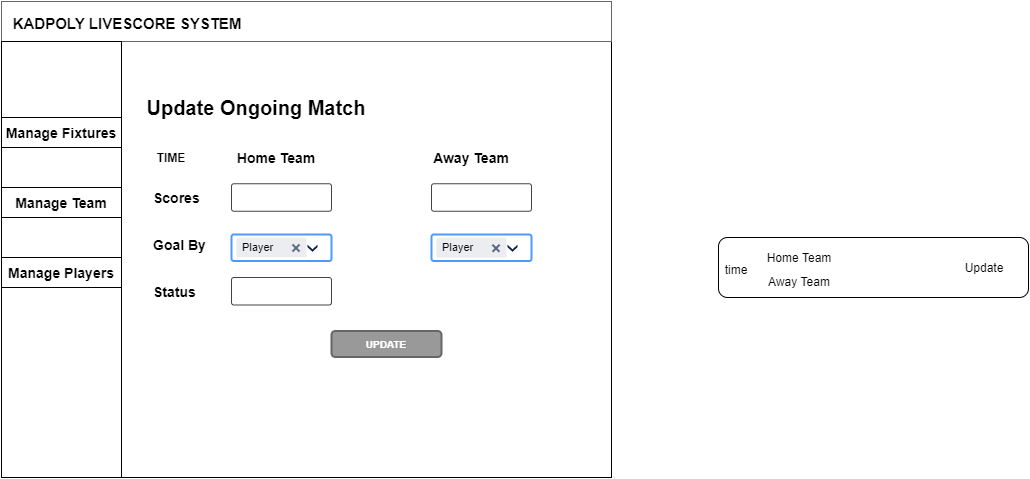


Fig. 3.6.2: Update Ongoing Match

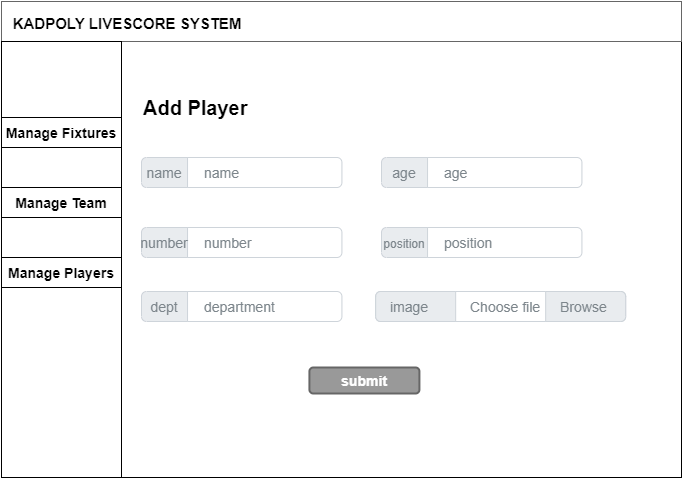


Fig. 3.6.3: Add Player

## SYSTEM REQUIREMENT

All software created has predefined system requirements that it must fulfill for optimal performance. These system requirements refer to the minimum hardware and software specifications necessary for the system to operate as intended.

### HARDWARE REQUIREMENTS

System Hardware Requirement;

* Minimum of Intel Dual core processor.
* Minimum of 1GB of RAM (Random Access Memory).
* Minimum of 64GB HDD (Hard Disk Drive).

### SOFTWARE REQUIREMENTS

The computer must be installed with the following programs for the new system to be implemented effectively:

* At least Windows 7 Operating System.
* Browsers includes: Chrome, Brave.
* Python (version => v3.8 )
* Visual Studio Code

## CHOICE OF PROGRAMMING LANGUAGE

This application might have been created in a variety of programming languages, but HTML, CSS, JavaScript, and Python (Django) were used. These programming languages were chosen for the following reasons: It is a web-based application that necessitates the use of a web programming language.

* **HTML** is a standard markup language used for creating the structure and presentation of webpages. It is the backbone of web development and is used to define the content and layout of a webpage. HTML5 was designed to improve the language with support for the latest multimedia, while keeping it easily readable by humans and consistently understood by computers and devices.
* **CSS (Cascading Style Sheets)** is a stylesheet language used the presentation and style of a document written in HTML or XML. It allows one to control the layout, color, fonts and other visual aspects of a webpage.
* **JavaScript** is a programming language that is commonly used to add interactivity and dynamic behavior to websites.
* **Python(Django)** is a high-level web framework that follows the model-view-controller (MVC) architectural pattern. It allows one to quickly develop web applications in Python by providing a set of tools and libraries for handling various aspects of web development.