# SPORTS MANAGEMENT SYSTEM

*A Project Report Submitted*

*to*

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*Of*

**Bachelor of Technology**

*in*

**Computer and Communication Engineering**

*by*


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# ABSTRACT

The Sports Tournament Management System is a comprehensive platform designed to streamline the organization and execution of sporting events. Its functionality encompasses various aspects, including efficient registration processes for teams and participants, automated fixture generation to optimize scheduling, real-time score tracking, and statistical analysis. The system also facilitates player management, ensuring compliance with regulations and fair play. Furthermore, it offers features for financial management, fan engagement, and post-event evaluation. Overall, the Sports Tournament Management System serves as a centralized hub for organizers, teams, and spectators, enhancing the overall experience and success of sporting tournaments.

**ACM Taxonomy Terms: -**

**[Software]: Tournament Management System; Sports Management System; Event Management System**

**[Computing Milieux]: Sports Industry; Sports Technology; Sports Software**

**[Information systems applications]: Sports Analytics; Player Management Systems**

## Sustainable Development Goals

**[SDG]: Industry, Innovation, and Infrastructure:** The implementation of a digital Sports Tournament Management System promotes innovation in sports management and infrastructure development, leading to more efficient and sustainable organization of tournaments.

**[SDG]: Good Health and Well-being:** By promoting sports events and encouraging physical activity, the project contributes to improving the health and well-being of individuals participating in sports tournaments.

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| Name | Date | Reason For Changes | Version |
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| | | | |

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# Abbreviations

- **NF- Normalization Form**
- **1NF- 1st Normalization Form**
- **2NF- 2nd Normalization Form**
- **3NF- 3rd Normalization Form**
- **BCNF- Boyce Codd Normalization Form**
- **SQL- Structured Query Language**
- **DBMS- Database Management System**
- **UI- User Interface**
- **CK- Candidate Key**
- **ERD- Entity Relationship Diagram**

# Chapter 1: Introduction

## 1.1) Purpose:

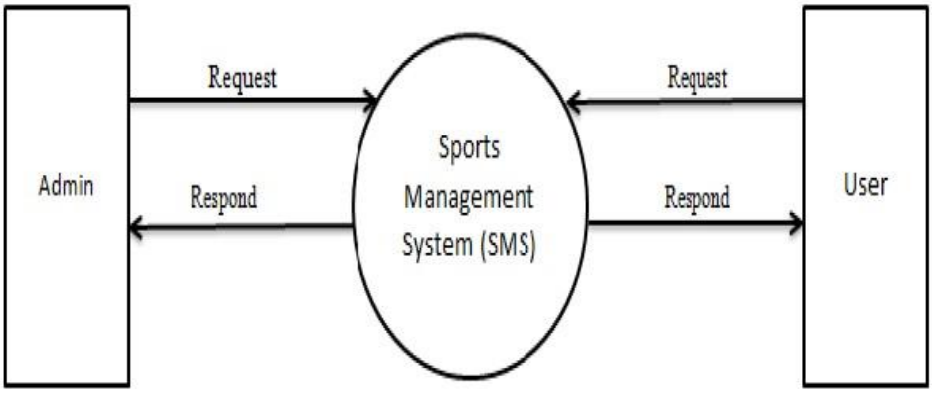
The purpose of the Sports Management System project is to revolutionize the organization and execution of sporting events by providing a comprehensive digital platform. By streamlining processes such as registration, scheduling, score tracking, and financial management, the system aims to enhance the efficiency, transparency, and overall experience of tournaments for organizers, participants, and spectators alike. Through automation and integration of key functionalities, the project seeks to optimize resource utilization, foster fair play, and promote community engagement in sports at various levels. Ultimately, the project strives to contribute to the advancement of the sports industry by leveraging technology to create more accessible, inclusive, and sustainable sporting experiences.

## 1.2) Product Scope:

The scope of the Sports Management System project encompasses the development of a robust digital platform tailored to meet the needs of organizing sporting events efficiently. This includes features such as automated registration processes, dynamic fixture generation, real-time score tracking, and comprehensive player management functionalities. Additionally, the project aims to incorporate elements for financial management, fan engagement, and post-event analysis. The system's scope extends to various sports and tournament formats, catering to both amateur and professional levels. Overall, the project strives to create a versatile and scalable solution that enhances the overall experience of sports tournaments while promoting inclusivity, fairness, and sustainability.

## 1.3) Product Perspective:

The Sports Management System will serve as an all-encompassing, independent, web-based platform that will manage various aspects of sports league operations.



# Chapter 2: Literature Survey/Background

Sports tournament management systems are digital platforms designed to streamline the organization and execution of sporting events. Various literature and existing systems provide insights into the features, technologies, and methodologies used in this domain. Several studies have highlighted the importance of such systems in improving the efficiency, transparency, and overall experience of sports tournaments. Existing literature often discusses the challenges faced in traditional tournament management processes, such as manual registration, scheduling conflicts, and lack of real-time data tracking. In response, researchers and practitioners have developed and implemented various sports tournament management systems to address these challenges.

**Common features found in sports tournament management systems include:**

**Registration and Participant Management:** Online registration portals for teams and participants, with features for managing player rosters and eligibility.

**Fixture Generation and Scheduling:** Automated scheduling algorithms to create fair and balanced match schedules, considering factors like team strengths, venue availability, and tournament structure.

**Score Tracking and Reporting:** Real-time score tracking and reporting capabilities to provide instant updates to organizers, participants, and spectators.

**Financial Management:** Tools for managing finances related to registration fees, ticket sales, sponsorships, and expenses, providing transparency and accountability.

**Communication and Engagement:** Features for communication between organizers, teams, and participants, as well as engagement tools for spectators, such as live updates and social media integration.

# Chapter 3: Objectives/Problem Statement

The primary objective of the project is to develop a comprehensive digital platform for sports tournament management. This platform aims to streamline the organization and execution of sporting events by providing automated tools and functionalities to manage various aspects of tournaments efficiently. The key objectives include:

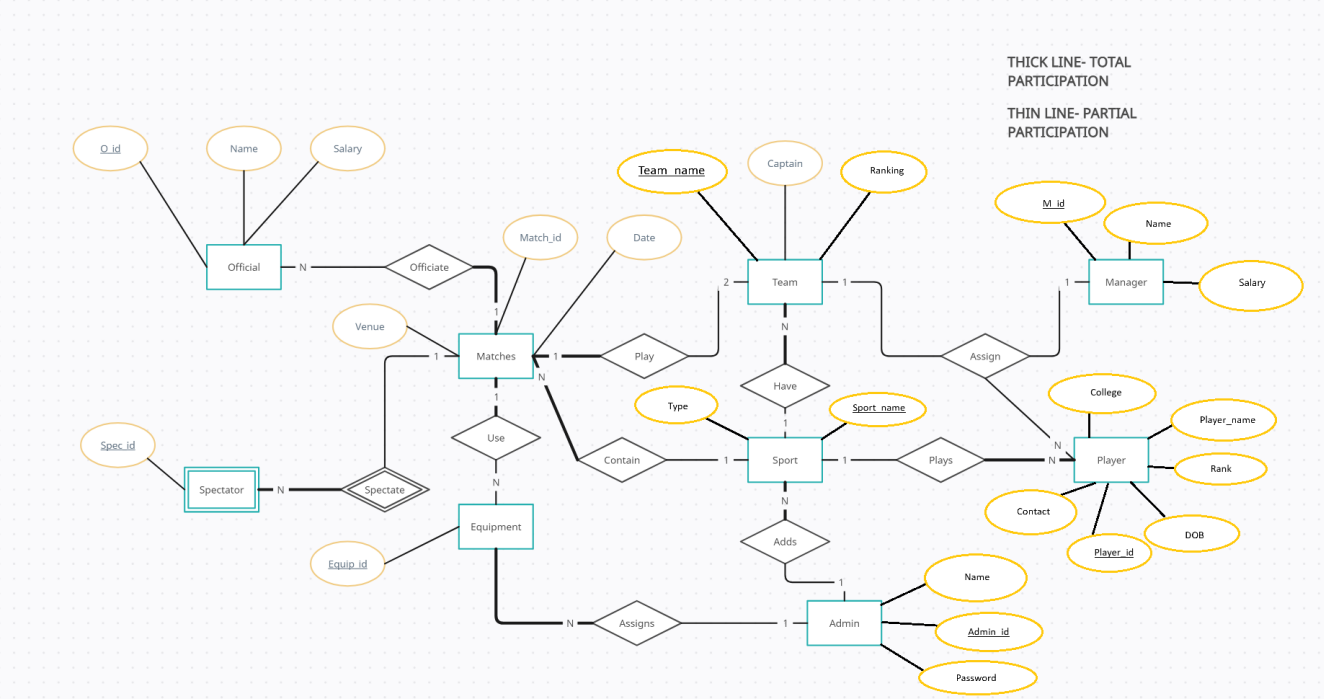
- Develop an intuitive and user-friendly digital platform that facilitates seamless registration processes for teams and participants.
- Implement automated fixture generation algorithms to optimize scheduling and ensure fair and balanced match schedules.
- Provide real-time score tracking and reporting capabilities to offer instant updates to organizers, participants, and spectators.
- Integrate financial management tools to facilitate transparent and accountable handling of finances related to registration fees, ticket sales, sponsorships, and expenses.
- Enhance communication and engagement between organizers, teams, participants, and spectators through features like live updates, social media integration, and multimedia content sharing.

The project aims to address several challenges and inefficiencies in traditional tournament organization processes, including:

- **Manual Registration Processes:** Streamlining the registration process by replacing manual paper-based forms with an online registration portal to reduce administrative burden and errors.
- **Scalability Challenges:** Ensuring the platform can accommodate tournaments of varying sizes, from small local events to large-scale international competitions, without compromising performance or functionality.
- **Data Privacy and Security Concerns:** Implementing robust measures to protect the privacy and security of participant data collected during the registration process and throughout the tournament.
- **Complexity in Tournament Organization:** Simplifying the process of organizing tournaments by providing intuitive tools and functionalities that make it easier for organizers to manage various aspects of the event.

# Chapter 4: Data Design

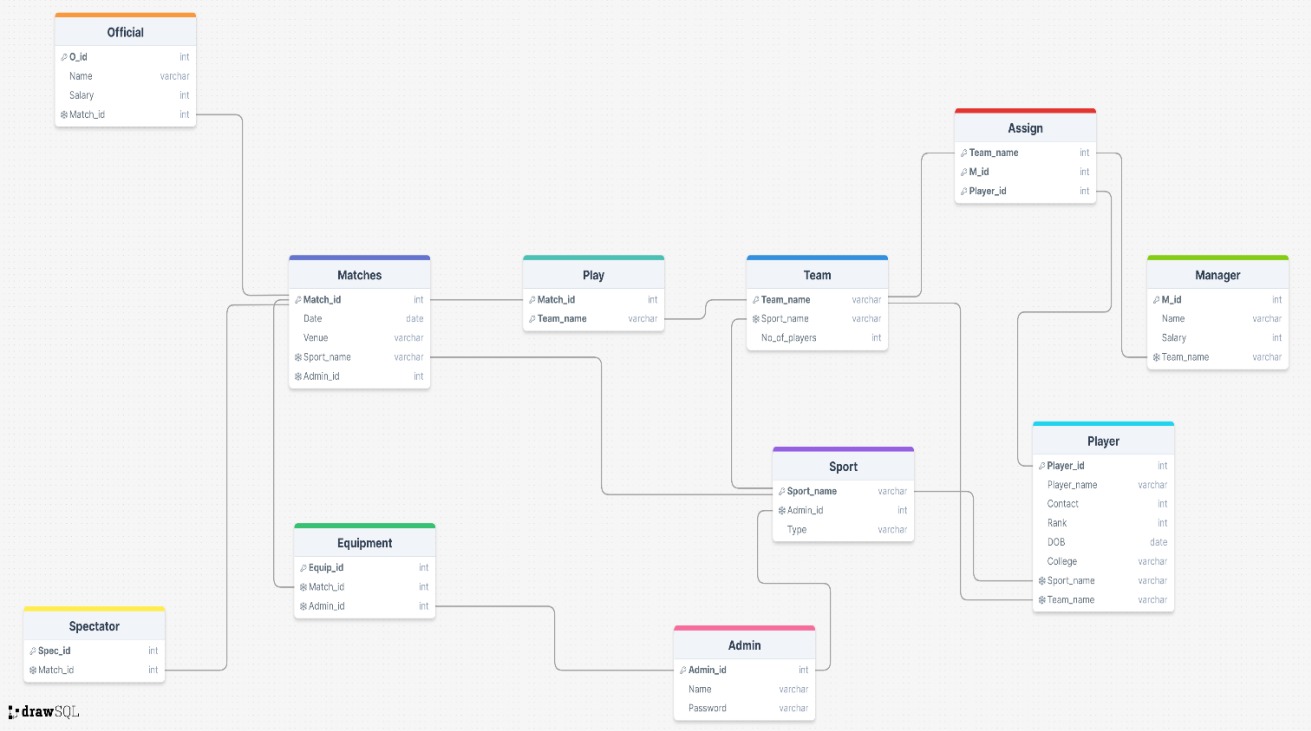
## 4.1) Entity Relation Diagram:




## 4.2) Reduced Schema:

1. Admin (Admin_id, Name, Password)
2. Sport (Sport_name, Admin_id, Type)
3. Matches (Match_id, Date, Venue, Sport_name, Admin_id)
4. Team (Team_name, Sport_name, No_of_players)
5. Play (Match_id, Team_name)
6. Player (Player_id, Player_name, Contact, Rank, DOB, College, Sport_name, Team_name)
7. Manager (M_id, Name, Salary, Team_name)
8. Equipment (Equip_id, Match_id, Admin_id)
9. Spectator (Spec_id, Match_id)
10. Official (O_id, Name, Salary, Match_id)
11. Assign (Team_id, M_id, Player_id)

## 4.3) Schema Diagram:




## 4.4) Normalization:

1) **Admin (Admin_id, Name, Password)**

**FD**

Admin_id ⟶ Name, Password

Since there is one 1 FD, it is the canonical cover.

- ✓ 1NF is satisfied.
  - Reason: No multivalued attributes.
- ✓ CK: Admin_id
- ✓ 2NF is satisfied.
  - Reason: No partial dependency.
- ✓ 3NF is satisfied.
  - Reason: Only 1 FD so there's no transitive dependency.
- ✓ BCNF is satisfied.
  - Reason: CK is on α (alpha) side.

2) **Sport (Sport_name, Admin_id, Type)**

**FD**

Admin_id, Sport_name ⟶ Type

Since there is only 1 FD, it is the canonical cover.

- ✓ 1NF is satisfied.

- Reason: No multivalued attributes.

✓ CK: (Sport_name, Admin_id)

✓ 2NF is satisfied.

- Reason: No partial dependency.

✓ 3NF is satisfied.

- Reason: Only 1 FD so there's no transitive dependency.

✓ BCNF is satisfied.

- Reason: CK is on α (alpha) side.

**3) Matches (Match_id, Date, Venue, Sport_name, Admin_id)**

**FD**

Match_id ⟶ Date, Venue
Match_id ⟶ Sport_name
Match_id ⟶ Admin_id

○ $(Match\_id)^+$ = Match_id, Date, Venue, Sport_name, Admin_id

✓ CK: Match_id

- Using Union we get,

✓ $F_c$: Match_id ⟶ Date, Venue, Sport_name, Admin_id

- No extraneous attribute.

✓ 1NF is satisfied.

- No multivalued attributes.

✓ 2NF is satisfied.

- Reason: No partial dependency.

✓ 3NF is satisfied.

- Reason: Only 1 FD so there's no transitive dependency.

✓ BCNF is satisfied.

- Reason: CK is on α (alpha) side.

**4) Team (Team_name, Sport_name, No_of_players, Ranking)**

**FD**

Team_name ⟶ No_of_players
Team_name ⟶ Sport_name
Team_name ⟶ Ranking

○ $(Team\_name)^+$ = Team_name, Sport_name, No_of_players, Ranking

✓ CK: Team_name

Using Union we get,

✓ $F_c$: Team_name ⟶ No_of_players, Sport_name, Ranking

- No extraneous attribute.

✓ 1NF is satisfied.

- Reason: No multivalued attributes.

✓ 2NF is satisfied.

- Reason: No partial dependency.

✓ 3NF is satisfied.
- Reason: Only 1 FD so there's no transitive dependency.

✓ BCNF is satisfied.
- Reason: CK is on α (alpha) side.

5) **Play (Match_id, Team_name)**

**FD**

Match_id ⟶ Team_name

Since there is only 1 FD, it is the canonical cover.

✓ 1NF is satisfied.
- Reason: No multivalued attributes.

✓ CK: (Match_id)

✓ 2NF is satisfied.
- Reason: No partial dependency.

✓ 3NF is satisfied.
- Reason: Only 1 FD so there's no transitive dependency.

✓ BCNF is satisfied.
- Reason: CK is on α (alpha) side.

6) **Player (Player_id, Player_name, Contact, Rank, DOB, College, Sport_name, Team_name)**

**FD**

Player_id ⟶ Player_name, College, DOB, Contact, Rank
Player_id ⟶ Sport_name, Team_name

- $(Player\_id)^+$ = Player_id, Player_name, College, DOB, Rank, Sport_name, Contact, Team_name

✓ CK: Player_id

Using Union we get,

✓ $F_c$: Player_id ⟶ Player_name, College, DOB, Contact, Rank, Sport_name, Team_name
- No extraneous attribute.

✓ 1NF is satisfied.
- No multivalued attributes.

✓ 2NF is satisfied.
- Reason: No partial dependency.

✓ 3NF is satisfied.
- Reason: Only 1 FD so there's no transitive dependency.

✓ BCNF is satisfied.
- Reason: CK is on α (alpha) side.

7) **Manager (M_id, Name, Salary, Team_name)**

**FD**

M_id ⟶ Team_name
M_id ⟶ Name, Salary

- ✓ $(M\_id)^+$ = M_id, Team_name, Name, Salary
- ✓ CK: M_id

Using Union we get,

- ✓ $F_c$: M_id ⟶ Team_name, Name, Salary
  - No extraneous attribute.
- ✓ 1NF is satisfied.
  - Reason: No multivalued attributes.
- ✓ 2NF is satisfied.
  - Reason: No partial dependency.
- ✓ 3NF is satisfied.
  - Reason: Only 1 FD so there's no transitive dependency.
- ✓ BCNF is satisfied.
  - Reason: CK is on α (alpha) side.

**8) Equipment (Equip_id, Match_id, Admin_id)**

**FD**

Match_id, Admin_id ⟶ Equip_id

Since there is only 1 FD, it is the canonical cover.

- ✓ 1NF is satisfied.
  - Reason: No multivalued attributes.
- ✓ CK: (Match_id, Admin_id)
- ✓ 2NF is satisfied.
  - Reason: No partial dependency.
- ✓ 3NF is satisfied.
  - Reason: Only 1 FD so there's no transitive dependency.
- ✓ BCNF is satisfied.
  - Reason: CK is on α (alpha) side.

**9) Official (O_id, Name, Salary, Match_id)**

**FD**

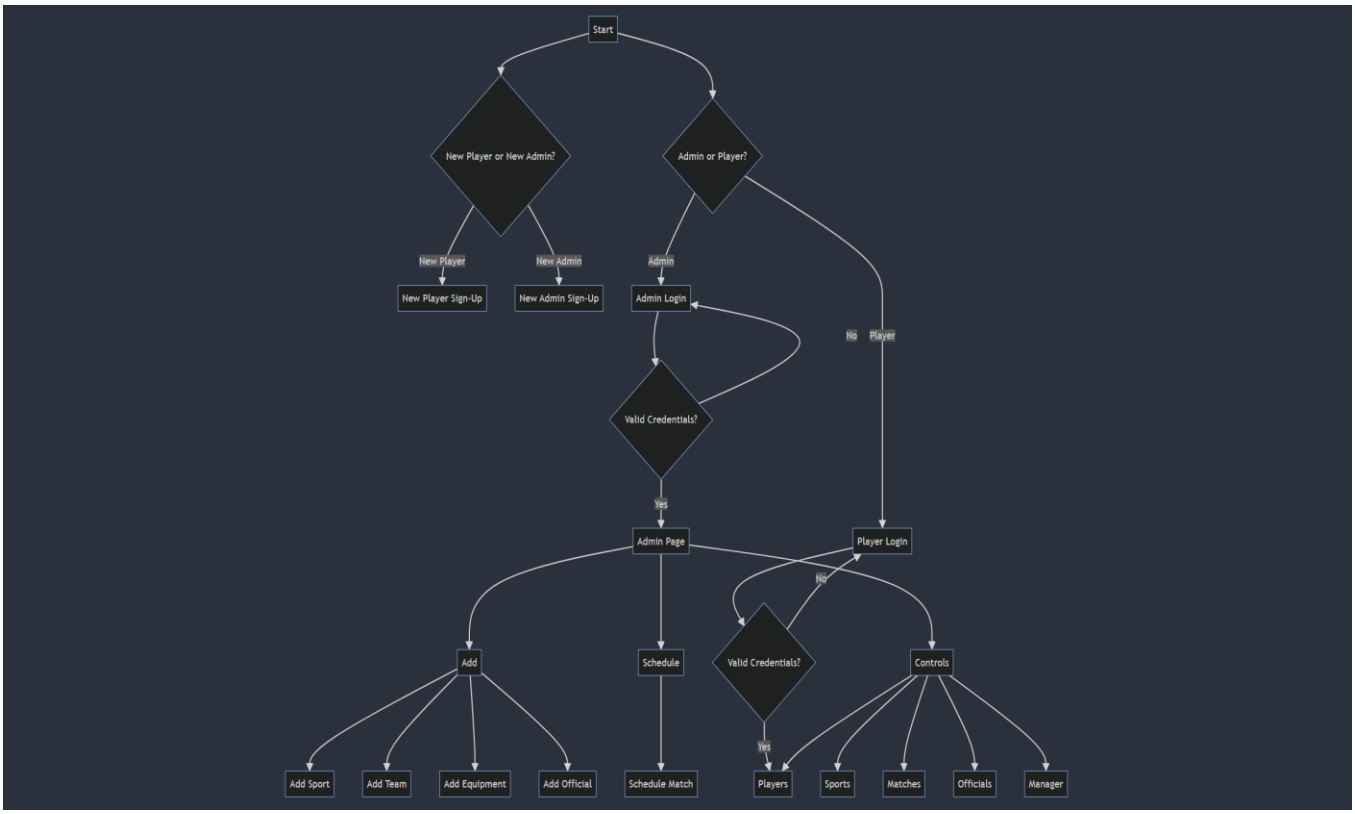
O_id ⟶ Match_id, Name, Salary

Since there is only 1 FD, it is the canonical cover.

- ✓ 1NF is satisfied.
    - Reason: No multivalued attributes.
- ✓ CK: (O_id)
- ✓ 2NF is satisfied.
    - Reason: No partial dependency.
- ✓ 3NF is satisfied.
    - Reason: Only 1 FD so there's no transitive dependency.
- ✓ BCNF is satisfied.
    - Reason: CK is on α (alpha) side.

# Chapter 5: Methodology

## 5.1) Implementation Block Diagram:




## 5.2) Implementation Details:

**Requirements Analysis:**

- Gathered requirements from stakeholders including tournament organizers, teams, participants, and spectators.
- Identified key features such as online registration, fixture generation, and communication tools.
- Defined the scope, objectives, and functionalities of the system based on the collected requirements.

**System Design:**

- Designed the architecture using C# in Visual Studio for the front end and MySQL for the database management system (DBMS).
- Defined the user interface design with intuitive navigation and user-friendly layouts.
- Created entity-relationship diagrams (ERDs) to model the database schema and relationships between different entities.
- Identified technologies and frameworks for application development and database management.

**Database Implementation:**

- Implemented the database using MySQL along with XAMPP, including the creation of tables, indexes, and constraints.
- Utilized SQL (Structured Query Language) and SQL/PSM (Persistent Stored Modules) for defining database schemas, queries, and stored procedures.
- Ensured data integrity and security by enforcing constraints and permissions within the database.
-

**Application Development:**

- Developed the front-end using C# in Visual Studio, including user interfaces, forms, and controls.
- Integrated the front end with the MySQL database to enable data retrieval, storage, and manipulation.
- Implemented business logic and application functionalities such as user authentication, registration, fixture generation and leaderboard tracking.
- Tested the application for functionality, performance, and usability before deployment.

# Chapter 6: Results

The Sports Management System's deployment resulted in more effective tournament management by streamlining procedures like scorekeeping, fixture creation, and registration. Its user-friendly interface enhanced the entire experience for viewers, competitors, and organizers alike, and its integrated money management capabilities guaranteed open and honest handling of tournament funds. The system proved to be adaptable and scalable to many sports and tournament forms, and it included strong security features to protect the confidentiality and integrity of user data. Its success in raising stakeholder happiness, productivity, and efficiency was demonstrated by positive comments and broad adoption. In the end, it fulfilled its goals of providing a full digital platform for managing sports tournaments.

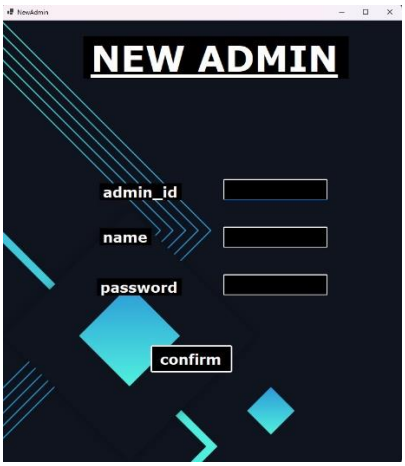
**Data Security and Integrity**: Robust security measures were implemented to protect the privacy and integrity of participant data, instilling trust and confidence in the system.
**Improved Decision Making**: The system provided organizers with valuable insights and data analytics, enabling informed decision-making and optimization of tournament operations.

**Efficient Tournament Organization**: The system streamlined various aspects of tournament organization, such as registration, and scheduling, leading to improved efficiency and reduced administrative burden.

1) **Login page:**

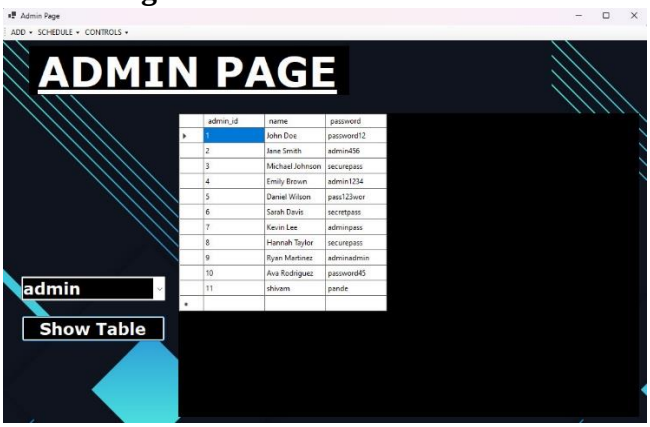

2) **New Player**

3) **New Admin:**

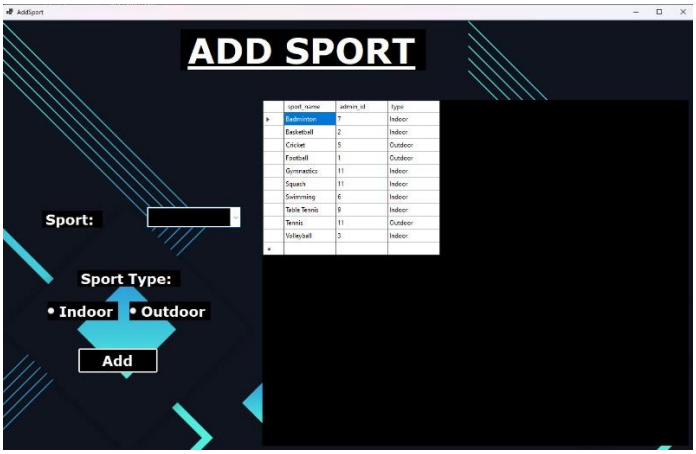



4) **New Player:**

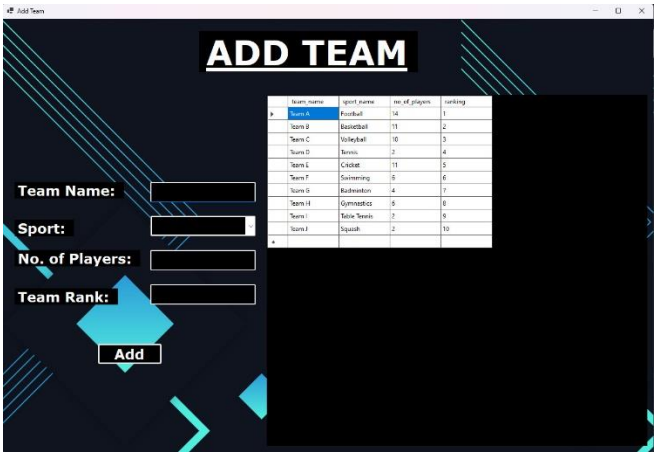

5) **Admin Page:**



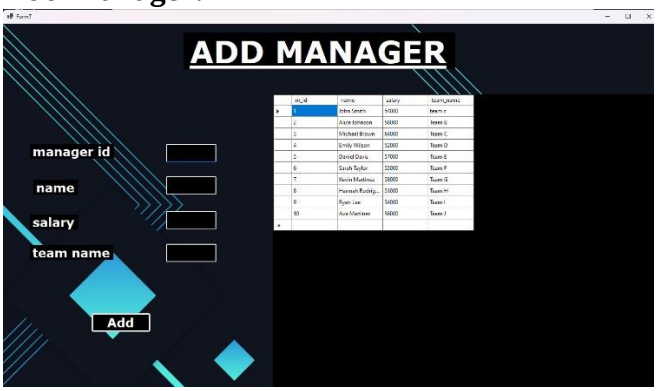

6) **Add Sport:**



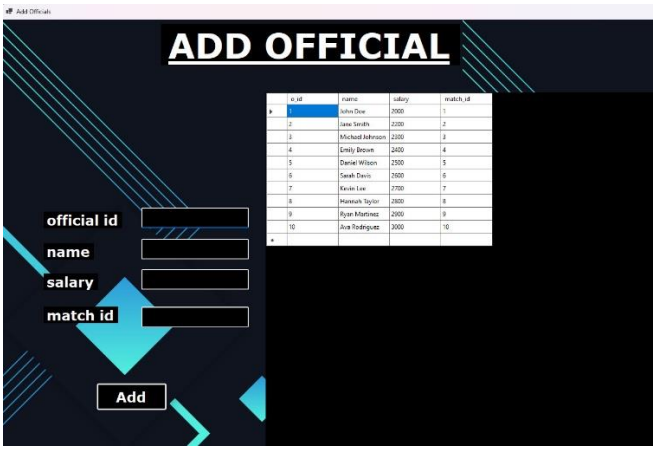

7) **Add Team:**



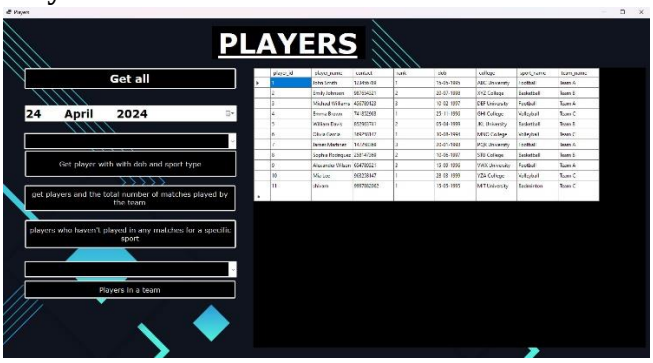

8) **Add Manager:**



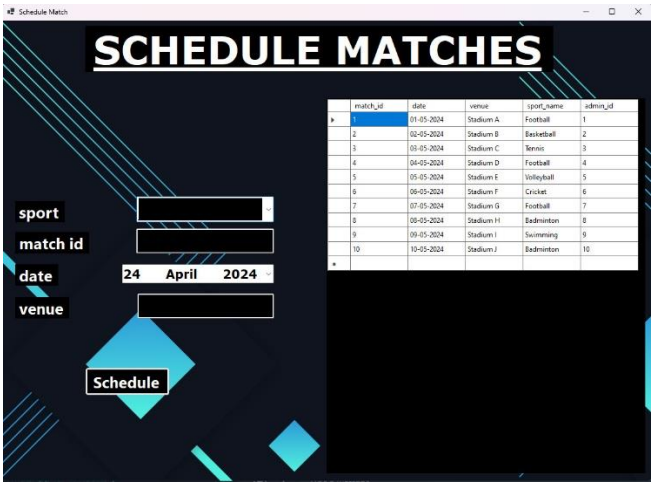

9) **Add Official:**




## 10) Players:

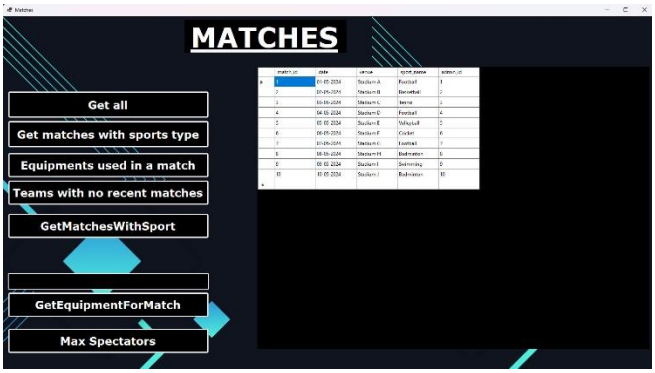



## 11) Schedule Match:

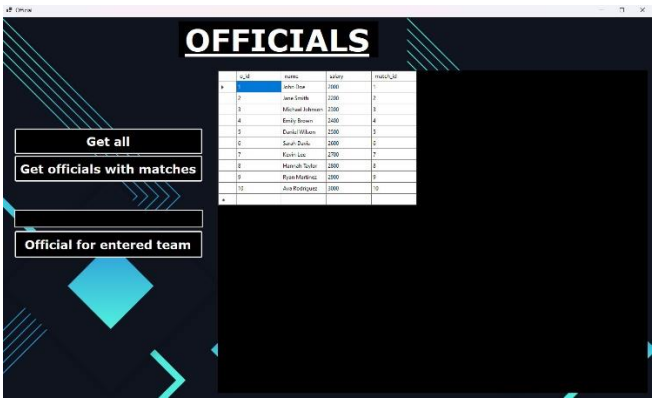



## 12) Sports:

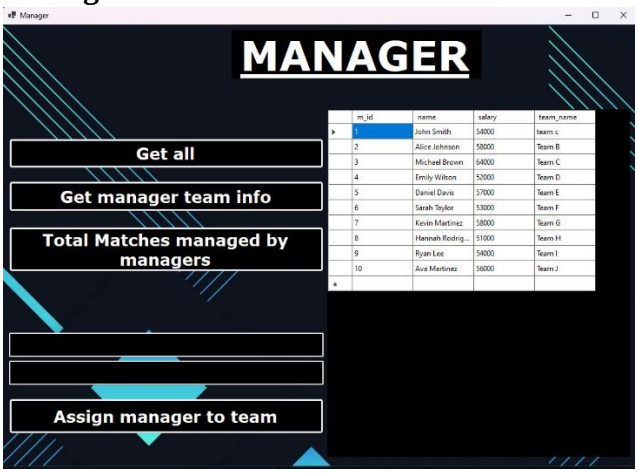
## 13) Matches:




## 14) Officials:




## 15) Manager:




## 16) Add Equipment:

# Chapter 7: Conclusion and Future Work

**Conclusion:**

The Sports Management System has been successfully developed, providing organizers, participants, and spectators with a comprehensive platform for efficiently managing sporting events. The system streamlines various tasks such as registration, analysis and scheduling, enhancing the overall experience for all stakeholders involved. Through intuitive user interfaces, real-time updates, and robust security measures, the system has demonstrated its effectiveness in improving efficiency, transparency, and engagement in sports tournaments.

**Future Works:**

1) Gamification and Social Features: Introduce gamification elements and social features such as leaderboards, challenges, and social media integration to promote engagement and interaction among participants and spectators.
2) Localization and Internationalization: Implement localization and internationalization features to support multiple languages and adapt the system to different cultural preferences and regulatory requirements, enabling global scalability.
3) Accessibility Improvements: Ensure the system complies with accessibility standards and guidelines, making it usable for individuals with disabilities and enhancing inclusivity.
4) Integration with IoT Devices: Explore integration with Internet of Things (IoT) devices such as sensors and cameras to capture real-time data during matches, enabling advanced analytics and enhancing the spectator experience with immersive content.

# Chapter 8: References

**[1]** Amrit Kumar Bhujel, Anuhangma Subba, Bishal Lamichaney and Sondeep Biswakarma, "SPORTS MANAGEMENT SYSTEM", Advance Technical Training Centre, Sikkim, Volume,03, Issue: 07, 2021

**[2]** Dzul Farizan Tumiran and Ismail Mat Amin," UTM Computing Proceedings Innovation in Computing Technology and Applications", Faculty of Computing, Universiti Technologi Malaysia (UTM), Malaysia, Volume: 2, 2017