

**A Project Report on
“SPORTS MANAGEMENT”**

Submitted to



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In
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CERTIFICATE

This is to certify that the Mini Project Report entitled **“SPORTS MANAGEMENT”** is a bonafide work carried out by **Arun Kumar(3GN22CS401), Arvind Kumar(3GN22CS400), Omkar(3GN22CS404), Fouad Baksh(3GN21CS031)** in practical fulfillment of the requirements for the award of Bachelor of Engineering in **V Semester Computer Science and Engineering of Visvesvaraya Technological University, Belagavi** during the year 2023-24. It is certified that all the corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The mini project has been approved as it satisfies the academic requirements in respect of major project work prescribed for the said degree.

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- 2.

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ABSTRACT

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1. Introduction

Database Management Systems (DBMS) play a pivotal role in the modern business landscape, enabling organizations to efficiently manage, store, retrieve, and manipulate data. A mini project based on DBMS offers a practical opportunity to explore the complexities of organizing and handling data effectively. This project can provide insights into various best practices for database management, emphasizing the importance of setting business goals, establishing policies and procedures, focusing on data quality, and ensuring data security.

Reducing duplicate data is another critical aspect of effective database management, aiming to eliminate data duplication and ensure efficient data storage and processing. It's also important to foster collaboration among different teams and departments that leverage data, ensuring everyone is aligned with data management practices. Utilizing user-friendly tools can further enhance data accessibility and usability across the organization, regardless of technical proficiency.

Investing in quality data-management software is recommended to facilitate the efficient handling of data, enabling the creation of the right data sets and scheduling that aligns with business needs. Proper documentation is also a key best practice, providing full context to why data exists and how it can be utilized.

Through this mini project, participants can gain hands-on experience with DBMS, applying these best practices to real-world scenarios. This experience not only enhances technical skills but also fosters an understanding of the strategic importance of effective data management in achieving business objectives.

1.1 Background Study

- Data Models: Understanding different data models such as hierarchical, network, relational, object-oriented, and NoSQL.
- Database Design: Learning about entity-relationship modeling, normalization, denormalization, and schema design.
- Query Languages: Exploring Structured Query Language (SQL), its syntax, data manipulation commands, and advanced querying techniques.
- Transactions and Concurrency Control: Understanding the concepts of transactions.

Database Management Systems (DBMS) are essential for organizing, storing, and manipulating data efficiently. Key concepts include understanding various data models, database design principles, SQL for querying, and managing transactions and concurrency. The evolution of DBMS technology from file-based to modern systems has seen the rise of relational, NoSQL, and NewSQL databases, each with its unique advantages.

A comprehensive understanding of DBMS foundational concepts, historical evolution, and current trends is crucial for effective database design, implementation, and evaluation. This knowledge provides a solid foundation for navigating the complexities of data management in the modern world.

1.2 Literature Survey

- Title: "Database Systems Concepts"

Authors: Abraham Silberschatz, Henry F. Korth, S. Sudarshan

Summary: This classic textbook covers the **principles of database systems, including data models, database design, transaction management, and query processing**. It offers a balanced blend of theory and practical examples, making it suitable for both beginners and advanced learners.

- Title: "SQL Performance Explained"

Authors: Markus Winand

Summary: This book delves into the **intricacies of SQL performance optimization, offering practical tips and techniques** for writing efficient SQL queries. It covers indexing, query execution plans, and best practices for improving database performance, making it invaluable for developers and database administrators.

- Title: "Database Systems: Design, Implementation, and Management"

Authors: Carlos Coronel, Steven Morris, Peter Rob

Summary: This textbook covers the entire **lifecycle of database systems**, from conceptual design to implementation and maintenance. It includes hands-on exercises, case studies, and project assignments to reinforce learning and practical application of DBMS concepts.

1.3 Motivation

The traditional method of recording sports equipment issuance and returns using handwritten registers or registry books presents several challenges, including the risk of loss, difficulty in tracking and managing equipment, and inefficiencies in data management.

This outdated approach not only complicates the process of keeping track of equipment but also hinders the ability to make informed decisions regarding equipment usage, inventory management, and overall sports management.

Transitioning to a digital solution that automates these processes, ensures data integrity, enhances accessibility, improves scalability, enhances security, and provides comprehensive reporting and analysis capabilities is crucial.

By adopting such a system, sports organizations can streamline their management processes, reduce errors, and maximize the efficiency and effectiveness of their equipment management strategies.

Our team would like to heartful gratitude to the Physical Directorate MD. Gaffar Sir to approach us to solve this issue and helping us out with the data we needed to complete this project.

1.4 Problem Statement

In the current sports management system, the process of issuing or returning items such as sports equipment or uniforms relies on manual entry in a handbook or register book. However, this traditional method of recording transactions poses several challenges:

- **Risk of Data Loss:** Handwritten entries in a handbook or register book are susceptible to loss, damage, or misplacement, leading to potential data loss and inconsistency.
- **Inefficiency:** Manual recording of transactions is time-consuming and prone to errors, requiring staff members to dedicate significant time and effort to maintain records accurately.
- **Lack of Accessibility:** Retrieving historical transaction data from handwritten records can be cumbersome and time-consuming, as it requires manual search and verification.
- **Limited Scalability:** As the volume of transactions increases, managing handwritten records becomes increasingly challenging, leading to inefficiencies and potential errors.
- **Security Concerns:** Handwritten records lack adequate security measures to protect sensitive transaction data, increasing the risk of unauthorized access or tampering.

1.5 Aim and Objective

AIM: -

The aim of this project is to minimize the challenges associated with the traditional method of recording sports equipment issuance and returns by implementing a Database Management System (DBMS).

By DBMS technology, we seek to enhance data integrity, accessibility, and security, ultimately improving the efficiency and reliability of sports equipment management.

OBJECTIVE: -

- **Automate Transaction Recording:** Replace manual handwritten registers with an automated system for recording sports equipment issuance and returns.
- **Enhance Accessibility:** Create a user-friendly interface for authorized personnel to access and retrieve transaction data efficiently.
- **Enhance Security:** Implement authentication, authorization, and encryption within the DBMS to protect sensitive transaction data from unauthorized access.
- **Ensure User Training and Support:** Offer comprehensive training and support to users to maximize the benefits of the DBMS in streamlining sports equipment management processes.

1.6 Organization of the Thesis

- Database Design and Schema Development:
 - Conduct a thorough analysis of the data requirements for sports equipment management.
 - Design the database schema, including tables, relationships, and attributes.
 - Define constraints, indexes, and other database objects to ensure data integrity and performance.
- User Interface Design and Development:
 - Design an intuitive and user-friendly interface for interacting with the DBMS.
 - Develop frontend components using appropriate technologies such as web or mobile frameworks.
 - Ensure seamless integration with backend database functionalities for data retrieval and manipulation.
- Backend Development and Implementation:
 - Implement the backend logic for handling transactions, authentication, authorization, and data processing.
 - Integrate the database management functionality into the backend system, ensuring proper interaction with the database.
 - Implement security measures such as access control, and auditing to protect sensitive data.

- Testing and Quality Assurance:
 - Conduct thorough testing of the DBMS solution to validate functionality, performance, and reliability.
 - Perform unit testing, integration testing, and system testing to identify and resolve any defects or issues.

- Deployment and Deployment:
 - Prepare the DBMS solution for deployment in the production environment.
 - Configure servers, databases, and other infrastructure components as needed.
 - Conduct deployment testing to ensure a smooth transition to the production environment.

- Training and Documentation:
 - Develop comprehensive documentation for the DBMS solution, including user manuals, technical guides, and system documentation.
 - Provide training sessions for administrators and end-users to familiarize them with the DBMS functionality and usage.
 - Offer ongoing support and assistance to address any issues or questions that may arise during the initial rollout and beyond.

2. About Your Domain

2.1 Data Base Management

- **Data Organization:** DBMS structures data for easy access, retrieval, and manipulation, including data models, schemas, and entity relationships.
- **Data Storage:** DBMS manages physical data storage on devices like hard drives or cloud storage, optimizing storage and retrieval for efficiency.
- **Data Retrieval:** DBMS uses SQL and other query languages for data querying and retrieval, supporting complex data analysis tasks.
- **Data Security:** DBMS secures data with authentication, authorization, encryption, and auditing to protect against unauthorized access and tampering.
- **Control:** DBMS manages concurrent data access by users, using mechanisms like locking, transactions, and isolation levels to maintain data consistency.
- **Data Integrity:** DBMS enforces integrity constraints to ensure data accuracy and consistency, including primary and foreign keys, and validation rules.

2.2 C# & Structured Query Language

C#:

- Developed by Microsoft, part of the .NET framework.
- Used for various applications: desktop, web, mobile, games.
- Known for simplicity, readability, and advanced features like asynchronous programming and LINQ.

SQL:

- Standard language for managing relational databases.
- Used for operations on databases: querying, inserting, updating, deleting records, managing schemas, permissions.
- Works with RDBMS like Microsoft SQL Server, TSQL.
- Queries are written in declarative syntax, focusing on what data is needed.

2.3 Windows Forms (WinForms)

Windows Forms is a UI framework provided by Microsoft for creating desktop applications on the Windows platform. Developers can design and create forms using a visual designer in Visual Studio, which allows them to drag and drop UI controls such as buttons, textboxes, labels, and dropdown lists onto the form.

WinForms supports event-driven programming, allowing developers to write code to handle user interactions and perform actions in response to events such as button clicks or text input. WinForms applications have a rich set of controls and components for building versatile and interactive user interfaces, making them suitable for a wide range of desktop applications.

3. Methodology

3.1 Existing System

➤ Issuing Items:

When a member of the sports department, such as an athlete, coach, or team manager, needs to borrow sports equipment or items from the inventory, they approach the designated staff member responsible for managing equipment. The borrower provides necessary information such as their name, student ID, and details of the items they wish to borrow, including the quantity and specific requirements.

The staff member manually records the transaction details in a designated handbook or register. This typically includes the borrower's name, ID, date of issuance, item(s) borrowed, quantity, and any relevant remarks or conditions associated with the transaction. The borrower may also be required to sign or acknowledge the transaction in the handbook or register, serving as confirmation of receipt.

➤ Returning Items:

When the borrowing period expires or the borrower no longer requires the items, they return the equipment to the sports department. Upon return, the staff member responsible for managing equipment receives the items from the borrower. The staff member inspects the returned items to ensure they are in the same condition as when they were issued. Any damages or discrepancies are noted.

The transaction details for the return, including the return date, condition of the items, and any remarks or notes, are manually recorded in the same handbook or register used for issuing items.

The borrower may also be required to sign or acknowledge the return transaction, confirming the return of the items.

➤ Record Maintenance:

The sports department staff is responsible for maintaining and updating the records in the handbook or register. Any changes or updates to the records, such as replacements, repairs, or discrepancies, are manually noted.

The handbook or register serves as the primary source of information for tracking the status and availability of sports equipment, managing inventory, and resolving disputes or discrepancies.

Periodic audits or checks may be conducted to reconcile the records and ensure accuracy.

3.2 Proposed System

The proposed “SPORTS MANAGEMENT” aims to the process of managing sports equipment issuance and returns, technology to enhance efficiency and accuracy. This system will facilitate the storage of large data sets, including details on items issued, their conditions upon return, and the administrators responsible for authorizing these transactions.

Key features include:

- Data Management: Efficiently manage large volumes of data, including transaction records, item details, and user information.
- Transaction Tracking: Automate the recording of item issuance and returns, capturing key details such as date, time, and authorized personnel.

- **User Authentication:** Implement a secure login system for administrative staff, ensuring that only authorized users can access and manage transactions.
- **Data Integrity and Security:** Utilize robust security measures to protect sensitive information and ensure data integrity throughout the process.
- **Accessibility and User-Friendly Interface:** Design an intuitive interface that makes it easy for staff to navigate and perform transactions, enhancing overall user experience.

This system not only addresses the current challenges of manual record-keeping but also sets the stage for future scalability and integration with other management tools, making it a comprehensive solution for sports equipment management.

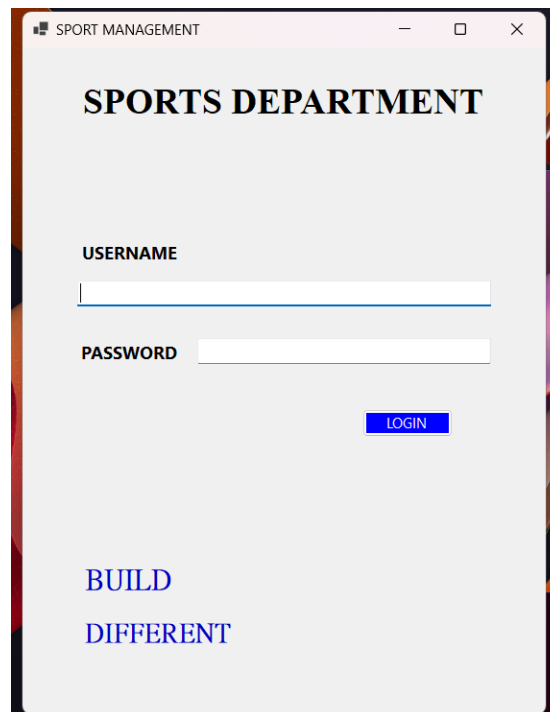
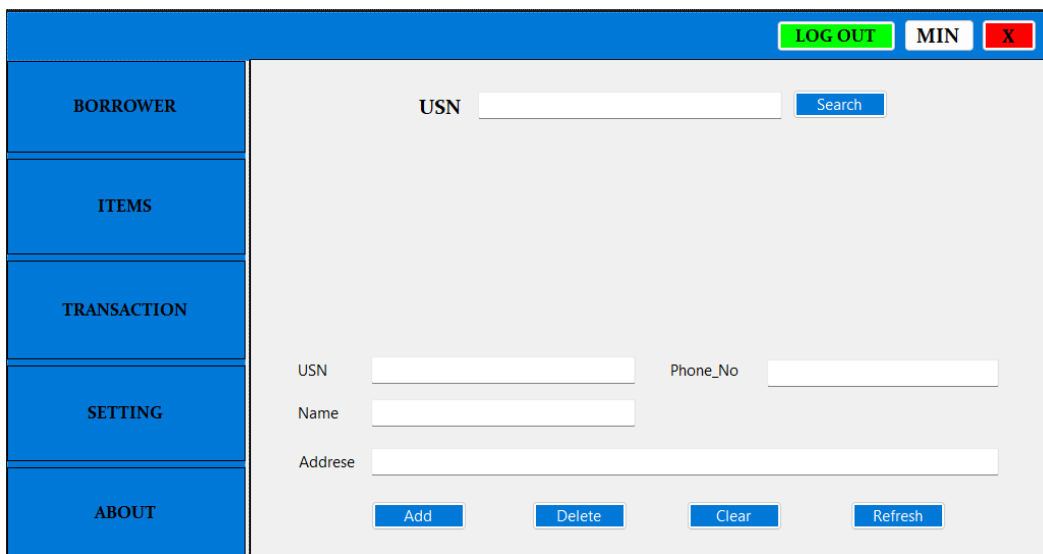
A screenshot of a web application window titled "SPORT MANAGEMENT". The main heading is "SPORTS DEPARTMENT". Below it, there are two input fields: "USERNAME" and "PASSWORD". A blue "LOGIN" button is positioned to the right of the password field. At the bottom of the form, there are two blue links: "BUILD" and "DIFFERENT". The window has standard OS controls (minimize, maximize, close) in the top right corner.

Fig1: - Login Form



A screenshot of a web application interface. At the top, there is a blue header bar containing three buttons: 'LOG OUT' (green), 'MIN' (white), and 'X' (red). Below the header is a vertical sidebar with five blue buttons: 'BORROWER', 'ITEMS', 'TRANSACTION', 'SETTING', and 'ABOUT'. The main content area is a large, empty light gray rectangle.

Fig 2: - App Form



A screenshot of a web application interface, similar to Fig 2. It features the same blue header bar with 'LOG OUT', 'MIN', and 'X' buttons, and the same vertical sidebar with 'BORROWER', 'ITEMS', 'TRANSACTION', 'SETTING', and 'ABOUT' buttons. The main content area is a light gray rectangle containing a form. At the top of the form is a label 'USN' followed by a text input field and a 'Search' button. Below this are four more input fields: 'USN', 'Phone_No', 'Name', and 'Addrese' (misspelled). At the bottom of the form are four buttons: 'Add', 'Delete', 'Clear', and 'Refresh'.

Fig 3: - User Control

4. Dataset

4.1 Training Dataset

Table 1: Borrower details (borrowerTable)

USN	Name	Phone no	Address
3GN22CS401	Praveen	7894561230	Mailoor
3GN21EE501	Shubham	8945612307	Gumpa
3GN22CV569	Ravi	9874563212	Vidhya Nagar
3GN22EC001	Priya	7945628562	Shivnagar
3GN22IS236	Megha	6589471235	Kolar
3GN20EC245	Tipu	9478564102	Chitta
3GN22AI364	Kalam	9874123548	Naubad

Table 2: Items details (itemTable)

accNo	Isbn	Name	D_id
11	501	Cricket-Bat	1
12	501	Cricket-Bat	1
31	502	Baseball-Bat	2
32	502	Baseball-Bat	2
41	503	Hokey-Bat	3
42	503	Hokey-Bat	3

Table 3: Department details (depTable)

Dep_id	Dep_Name	Room_code
1	Cricket	101
2	Baseball	102
3	Hokey	103

4.2 Processed Dataset

Table 4: Transaction details (transactionTable)

tNum	USN	Name	Date	Time	Authy	Item1	Item 2	Sub_Date
1	3GN22CS401	Praveen	12/09/22	1:00	Naresh	11		16/09/22
2	3GN21EE501	Shubham	12/09/22	2:00	Naresh		12	16/09/22
3	3GN22CV569	Ravi	12/09/22	3:00	Naresh	41	31	16/09/22
4	3GN22EC001	Priya	12/09/22	4:00	Naresh			
5	3GN22IS236	Megha	12/09/22	13:00	Naresh		11	16/09/22
6	3GN20EC245	Tipu	12/09/22	14:00	Naresh	32		16/09/22
7	3GN22AI364	Kalam	12/09/22	15:00	Naresh		42	16/09/22

5. Requirement Analysis

5.1 System Requirement Specification

5.1.1 General Description

- User Management: Supports authentication and authorization for users categorized by roles (admin, borrowers) with specific permissions.
- Equipment Management: Allows administrators to add, update, and remove sports equipment inventory with attributes like name, description, quantity, category, and availability status.
- Issuing and Returning: Enables users to request equipment issuance with specifications and borrowing period, admin to approve/reject requests, and borrowers to receive notifications and return instructions. Admin updates system on return transactions.
- Transaction Logging: Maintains logs of all issuance and return transactions for audit trails, reporting, and analysis, accessible to authorized users.
- Reporting and Analytics: Offers reporting and analytics features for equipment usage insights, standard reports, and T-SQL queries.

5.1.2 System Objectives

- **Automation:** Automates issuing and returning sports equipment, reducing manual effort.
- **Efficiency:** Faster operations for quick, accurate transactions.
- **Accuracy:** Reduces manual data entry, enhancing the reliability of records.
- **Data Integrity:** Maintains data accuracy and security, ensuring consistent information.
- **Accessibility:** Facilitates remote access for all authorized users.
- **Security:** Protects sensitive data from unauthorized access.
- **Scalability:** Can handle growth in data volume and user base without compromising performance.
- **User Satisfaction:** Aims to provide an easy-to-use, efficient system for users.

5.1.3 System Requirements

5.1.3.1 Non-Functional Requirements

- **Performance:** The system's efficiency in processing requests and executing transactions in a timely manner.
- **Portability:** The system's compatibility across diverse hardware configurations, operating systems.
- **Reliability:** The system's ability to operate consistently and reliably without downtime or disruptions, and its capability to recover swiftly from any failures.
- **Security:** Safeguarding the system and its data from unauthorized access.
- **Usability:** The system's ease of use and intuitive interface, facilitating user interaction and adoption while minimizing training requirements.

5.1.3.2 Functional Requirements

- **User Authorization:** Implementing a role-based access control mechanism that restricts the borrowing and returning of sports equipment to authorized users (athletes, coaches, managers) based on predefined roles and permissions.
- **Borrowing Process:** Enabling users to submit equipment borrowing requests with details such as the items needed, quantity, and borrowing duration, which are then reviewed and approved by administrators or staff members.
- **Issuance Record Management:** Keeping detailed records of all equipment issuances, including borrower information, items borrowed, issuance date, and return due date, for inventory management and tracking purposes.
- **Returning Process:** Facilitating a return process where users can return borrowed equipment, and the system verifies the returned items against the issuance records to update the status accordingly.
- **Return Verification:** Ensuring that administrators or staff members can verify the condition and quantity of returned items, noting any discrepancies or damages, and taking appropriate actions such as repair or replacement.
- **Audit Trail:** Maintaining an audit trail of all transactions related to borrowing and returning equipment, including timestamps, user IDs, and action details, for accountability and traceability.

5.2 Software Specifications

- **Operating System Compatibility:** Compatible with Windows 10, 8, and 7.
- **Development Platform:** Utilizes Microsoft Visual Studio for Windows application development.
- **Programming Language:** Developed in C# for Windows applications, integrating with the .NET framework.
- **User Interface Framework:** Uses Windows Presentation Foundation (WPF) for the UI.
- **Database Management System (DBMS):** Employs Microsoft SQL Server for data management.
- **Database Access Technology:** Accesses and manipulates database using ADO.NET.
- **Security Framework:** Implements security with .NET's ASP.NET Identity for authentication and authorization.
- **Deployment Environment:** Deployed on Windows servers with IIS for web hosting.
- **Integrated Development Environment (IDE):** Utilizes Microsoft Visual Studio for development and testing.