

Sports Equipment Management System

*Project Report by **Indrajeet Ratnakar(16CO116)***

Abstract

Sports Equipment Management System is a web-based application, developed to manage the sports equipments in well organised way. It maintains the information about sport equipments available in store such as company of a particular item,availability,the details of their employees.

User needs to register in this website and by logging in,he/she can explore all the items available in store by selecting a particular category of sport such as cricket,football and borrow and return sport items . It lists all the items borrowed by student.

It keeps record of all sports items available in store and the sports items which are issued to students and new purchased items are added to the stock by referring the item code.

Admin can add,delete,update sports equipment and view the users who have borrowed sports item from store.

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1. Introduction

1.1 Purpose:

Sports Equipment Management System is an application that keeps track of sports equipments of store. Through this application user can borrow sport item and return as well. It enables manager to create and store sports equipment records. Manager can add new equipments to store and delete as well. He/She can update the availability of a particular sports equipment in store and view all items issued to users. This application is helpful to department of the organization which maintains data of sports equipments related to an organization.

1.2 Objective :

For any organisation which has to maintain huge number of records and data, it becomes very difficult to manage informations. The Sports Equipment Store also faces the same issue. To overcome this problem, to maintain data of large number of users, sports equipments there is a need of solution. This project simplifies the task of maintaining records because of its user friendly nature.

2. Requirement specifications

The aim of the system is to develop “SPORTS EQUIPMENT MANAGEMENT SYSTEM” software, which should keep track of borrowed sport items and user details .

2.1 Hardware Requirements:

- **Web Server** : We need a reliable web server for our system. This machine must be fast and must show high performance in all situations. This application was run in windows and mac os system.

- **Database Server** : Since our system is not of great or higher scale, local Database server will be used for storing data with good internet connectivity.

2.2 Software Requirements:

- **Web Server** : XAMPP WEB SERVER: It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes of PHP and MySQL based website.

- **DBMS** : MYSQL database will be used to store records and data.

- **Development**: For development phase of this system ,front end has been designed using HTML and CSS and for backend PHP is used to communicate with MySQL server.

Tools used:

- Google chrome browser
- Sublime Text
- Xampp control panel

·**Supported Web Browsers**: Google chrome,firefox

3.Database Design:

3.1 ER Diagram:

Description of Sports Equipment management System :

ER diagram shows that , there are 3 entities:

- Manager
- Student
- Sports Equipment

Manager entity has 4 attributes:

Manager_id,first_name,last_name,contact

Student entity has 4 attributes:

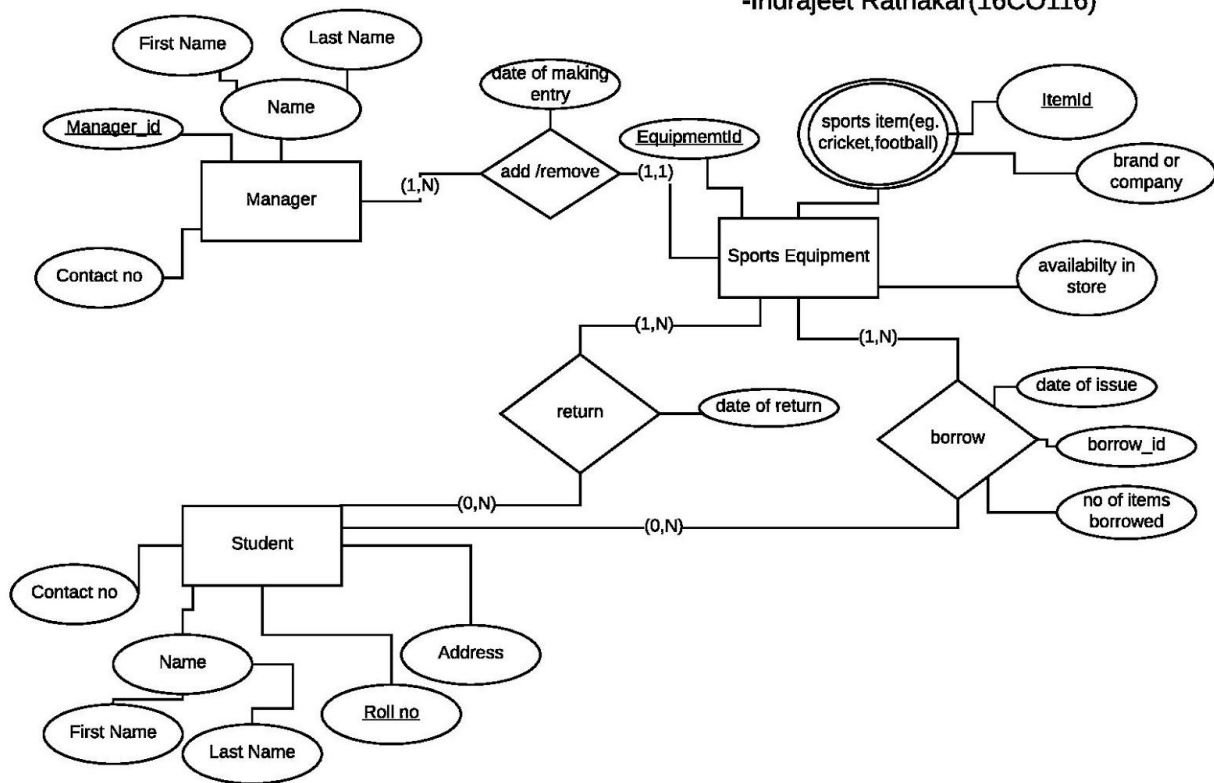
Student_id,first_name,last_name,contact

Sports Equipment entity has 3 attributes:

Equipment_id,availability,sport_item

ER Diagram :Sports Equipment Management System

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Where sport_item is a multivalued attribute, which has itemid and brand as attributes.

Sport Equipment is an entity type which defines a category of sport items like Cricket, Football, Badminton and sport item is a composite attribute of Sports Equipment which defines a particular item of a sports category such as a bat of Reebok brand of Cricket category or rackets of Yonex brand of Badminton category.

In this ER diagram, there are 3 relationship types:

- add/remove: Manager uses this relationship type to make entry in sports stock and update availability and it has one attribute as date of making entry.
- Borrow: Student uses this relationship type to borrow sport items from store and it has following attributes:
Borrow_id, date_of_issue, no_of_items_borrowed
- Return: Student uses this relationship type to return sport items which they had borrowed from store and it has date_of_return as attribute

3.2 Relational Database Design:

Mapping of ER diagram with Relational schema:

1) For each entity a relation has been created :

| Entity | Relation |
|----------------------|--------------|
| Manager----- | Manager |
| Student----- | Student |
| Sports Equipment---- | Sports_stock |

2) Since sport_item is a multivalued attribute, for this Sport_item as a new relation has been created.

3) Since for each relationship type which is of M:N type, a relation is created. Here, borrow and return are of M:N relationship type. So, for this two relationship types relations have been created as Borrow and Return_item respectively.

Following are the relations of Sports Equipment Management System with attributes specified in the relation and corresponding meaning and values .

- Manager Relation:

| Attribute | Meaning | Value |
|----------------|---|-------------|
| mngr_id | a unique id to manager(serves as primary key) | int(3) |
| mngr_username | A unique username to manager | varchar(20) |
| mngr_password | A unique password to manager | varchar(20) |
| mngr_firstname | First name of manager | varchar(20) |
| mngr_lastname | Last name of manager | varchar(20) |
| mngr_phone | Phone no of manager | varchar(10) |
| mngr_email | Email address of manager | varchar(50) |

- Student Relation:

| Attribute | Meaning | Value |
|-----------|---------|-------|
|-----------|---------|-------|

| | | |
|-------------|---|-------------|
| s_id | a unique id to student(serves as primary key) | int(3) |
| s_username | A unique username to student | varchar(20) |
| s_password | A unique password to student | varchar(20) |
| s_firstname | First name of student | varchar(20) |
| s_lastname | Last name of student | varchar(20) |
| s_phone | Phone no of student | varchar(10) |
| s_email | Email address of student | varchar(50) |

● Sports_stock Relation:

| Attribute | Meaning | Value |
|--------------|--|--------------|
| EquipmentId | a unique id to Equipment like Bat,Ball,football, Badminton rackets(serves as primary key) | varchar(50) |
| availability | Availability of that equipment in store | int(3) |
| entryDate | Date of making entry of equipment in database | date |
| sport_item | Name of Sport Item such as bat,ball,shuttlecock etc. | varchar(100) |
| category | Refers to a particular sport In which that EquipmentId belongs(like Bat belongs to Cricket,Shuttlecock belongs to Badminton) | varchar(100) |

- Sport_item Relation:

| Attribute | Meaning | Value |
|-------------|---|--------------|
| item_id | a unique id to sport item like MRF Bat, Duke Ball, Adidas football, (serves as primary key) | varchar(255) |
| brand | Specifies the brand of item Like MRF or Reebok for bat. | varchar(255) |
| EquipmentId | Foreign key referencing Equipment Id from Sports_stock | varchar(255) |
| no_of_items | Specifies the no of sports items of a particular brand(like 6 MRF bat) | int(3) |

- Borrow Relation:

| Attribute | Meaning | Value |
|-------------|--|-------------|
| borrow_id | a unique id to borrow event (serves as primary key) | int(10) |
| uid | Foreign key referencing S_Id from Student | int(3) |
| EquipmentId | Foreign key referencing Equipment Id from Sports_stock | varchar(50) |

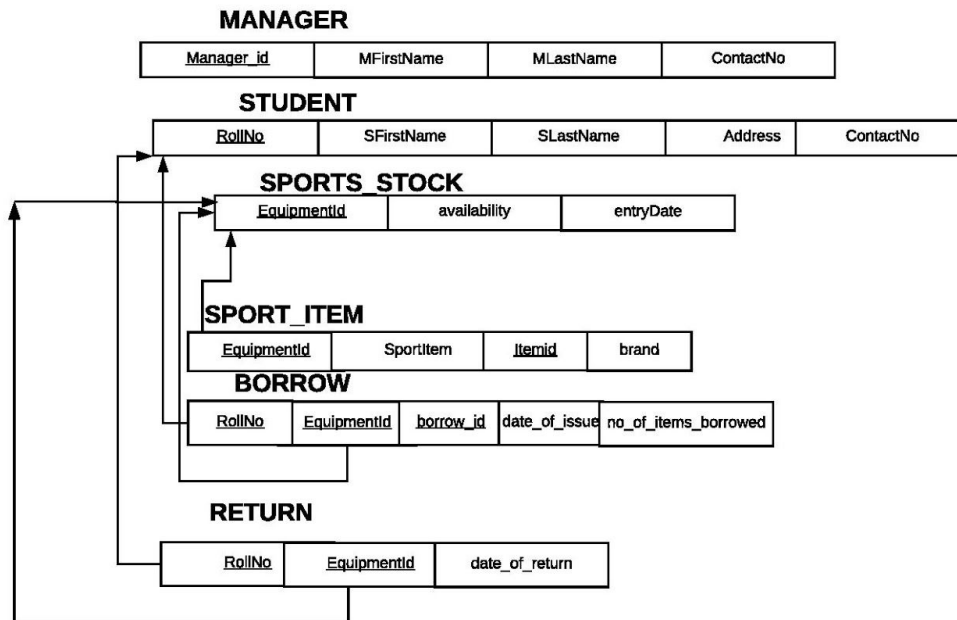
| | | |
|----------------------|--|--------------|
| item_id | Foreign key referencing item_d from Sport_item | varchar(255) |
| date_of_issue | date on which item was borrowed | date |
| no_of_items_borrowed | Specifies no of items borrowed | int(3) |
| brand | Brand of borrowed item | varchar(50) |

• Return_item Relation:

| Attribute | Meaning | Value |
|----------------|--|--------------|
| return_id | a unique id to return event (serves as primary key) | int(10) |
| uid | Foreign key referencing S_Id from Student | int(3) |
| EquipmentId | Foreign key referencing Equipment Id from Sports_stock | varchar(50) |
| item_id | Foreign key referencing item_d from Sport_item | varchar(255) |
| date_of_return | date on which item was returned | date |

SPORTS EQUIPMENT MANAGEMENT SYSTEM RELATIONAL DATABASE SCHEMA

Indrajeet Ratnakar | September 8, 2018



3.3 Constraints in relation Schema:

Key Constraints:

In the Sport_item(relation), EquipmentId is a foreign key which is referencing EquipmentId (primary key) of Sports_stock and on this attribute ON DELETE CASCADE ON UPDATE CASCADE constraint has been added so that when EquipmentId of Sports_stock is deleted EquipmentId of Sport_item is also get deleted.

In the Borrow and Return_item relations itemid,EquipmentId and uid are referencing itemid of Sport_item,EquipmentId of Sports_stock, S_id of Student respectively and on these attributes ON DELETE RESTRICT constraint has been added.

Structural Constraints(Cardinality Ratio and participation ratio)

| Entity Type | Relationship Type | C.R. and P.R using (min,max) notation |
|------------------|-------------------|---------------------------------------|
| Manager | add/remove | (1,N) |
| Sports Equipment | add/remove | (1,1) |
| Student | borrow | (0,N) |
| Student | return | (0,N) |
| Sports Equipment | borrow | (1,N) |
| Sports Equipment | return | (1,N) |

4. Project Components

4.1 Front End Design:

In this project, there are two sections

- Admin section
- Student section

In the Admin section, following modules have been implemented:

- Admin Login
- Forgot password
- View Profile
- Edit Profile
- Add Sports Equipment
- View Sports Equipment
- Edit Sports Equipment
- Delete Sports Equipment
- Issued Sports Item

1) Admin Login : when the application is loaded in the web browser, home page will be displayed. There will be a menu of admin login, by entering username and password correctly, admin will be redirected to his/her respective page. If username/password do not match with existing data in database, a warning will be shown like wrong username/password combination.

2) Forgot Password: In the Admin login page there is a link

namely “Forgot password?”,by clicking this link admin will be redirected to a webpage where admin can reset his/her password by confirming registered email.

3)View Profile: when Admin logs in,It is a default web page which will be displayed.Admin can view all his/her credentials.

4)Edit Profile: Via this module, admin can update his/her credentials.

5)Add Sports Equipment: On clicking this menu,admin will be redirected to a web page where he/she can add new sports equipment to the store by entering a unique Equipment Id and other details.when Submit button is clicked ,it checks whether there exists a sports equipment with this same equipment Id .If yes,then it generates a warning.

6)View Sports Equipment: Through this module, admin can view sport equipments available in the store and availability ,brand of item and other details as well.

7)Edit Sports Equipment: In this module,admin can update availability of a particular sports equipment by entering Equipment id and new availability for that equipment Id.

8)Delete Sports Equipment: If some equipments are no longer available in store ,corresponding Equipment Id can be deleted ,which removes all the details related to that Equipment Id.

9)Issued Sports Equipment: This module will show all the sports item issued to students and details of students who have borrowed sport items from the store.

In the Student section, following modules have been implemented:

- Register
- Student Login
- Forgot password
- View Profile
- Edit Profile
- View Sports Equipment
- Borrow Sports Equipment
- Return Sports Equipment
- Issued Sports Item

1) Register: when the home page is loaded in the browser, there is a menu for students to register on this application. By entering all the details including username, email, password, student can get registered to use this application. While submitting credentials, application checks whether there already exists a user with the entered username or email, if no, then user is successfully registered.

2) Student Login : when the application is loaded in the web browser, home page will be displayed. There will be a menu of student login, by entering username and password correctly, student will be redirected to his/her respective page. If username/password do not match with existing data in database, a warning will be shown like wrong username/password combination.

3) Forgot Password: In the Student login page there is a link namely “Forgot password?”, by clicking this link student will be redirected to a webpage where student can reset his/her password by confirming registered email.

4)View Profile: when student logs in,It is a default web page which will be displayed.student can view all his/her credentials.

5)Edit Profile: Via this module, student can update his/her credentials.

6)View Sports Equipment: Through this module, student can view sport equipments available in the store and availability ,brand of item and other details as well.

7)Borrow Sports Equipment: Through this module,student can borrow sport items ,if that particular sports equipment is available in the store and that sport item is get deleted from Sport_item table and added to Borrow table.

8)Return Sports Equipment: Through this module,student can return sport items which were borrowed by him/her and new entry is made in Sport_item table in database and entry in the Borrow table is deleted corresponding to this item.

9)Issued Sports Equipment: This module will show all the sports item issued to student who is currently logged in.

4.2 Security Measures:

Below there are a list of possible vulnerability that may occur while creating this application:

1)SQL INJECTIONS:

SQL injection is a type of web application security vulnerability in which an attacker attempts to use application code to access or corrupt database content.

To overcome this issue,before being processed by the application, the data should be validated. Invalid data should not be processed at all. Possibly valid data should be escaped before passing it to the database as query parameters.

For this project, in the PHP source code, ***mysqli*** keyword has been used instead of mysql and escape keywords have been used to extract string from inputs.

Passwords have been encrypted using the **md5(password)** function.

Technical details have been removed from error messages displayed to the users because smart hackers may get into the system using these details, like database names, usernames and tables names.

2) Session and Cookie Hacking:

When user logs into website, a session ID is created, and a session hacker tries to obtain the legitimate user's session ID and use the information for unfair means. When the hacker tries to reuse a session ID, it is known as session fixation, and it can allow hackers to login as an authentic user and cause alter or damage the user's account.

The risk of this hacking has been mitigated by revalidating a user who is about to perform important or sensitive tasks like resetting their password (i.e. by making them enter their email);

3) Error Handling Problems:

Another important area of concern is the error handling problems. Hackers may make some guesses about your software, PHP code, database tables and external programs. Such guesses may be used to exploit system.

Detailed descriptions should be avoided as much as possible in error messages. PHP code has been structured so that such error messages could sent to server's error log instead of showing to the user that by adding these options to the php.ini configuration file:

```
log_errors=On
```

```
display_errors=off
```

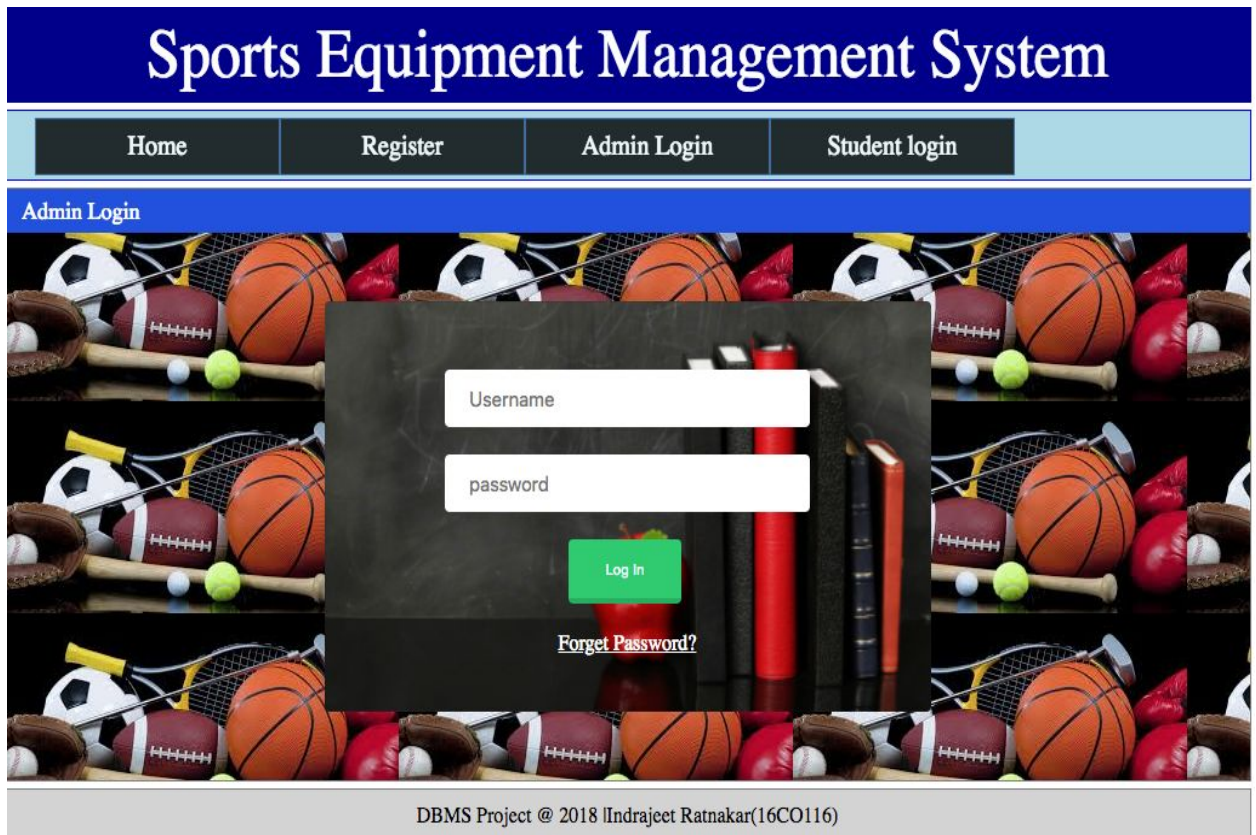
4) CROSS SITE SCRIPTING (XSS):

Cross-site scripting (XSS) targets an application's users by injecting code, usually a client-side script such as JavaScript, into a web application's output. The concept of XSS is to manipulate client-side scripts of a web application to execute in the manner desired by the attacker.

To overcome this issue, we run the data through PHP's `filter_var()` function with the `FILTER_SANITIZE_STRING` filter to sanitize the string which will strip out any tags that might slip through due to a bug in our code. `FILTER_SANITIZE_STRING` actually removes any tags it finds.

5. Results & Discussions:

1) Home Page:



The screenshot displays the homepage of the 'Sports Equipment Management System'. At the top, a dark blue header contains the system's name in white serif font. Below this is a navigation bar with four buttons: 'Home', 'Register', 'Admin Login', and 'Student login'. The 'Admin Login' button is highlighted, and a modal window is open over it. The modal has a dark background and contains two white input fields labeled 'Username' and 'password', a green 'Log In' button, and a link for 'Forgot Password?'. The background of the page is a collage of various sports equipment like soccer balls, basketballs, and tennis rackets. A footer at the bottom provides copyright information.

Sports Equipment Management System

Home Register Admin Login Student login

Admin Login

Username

password

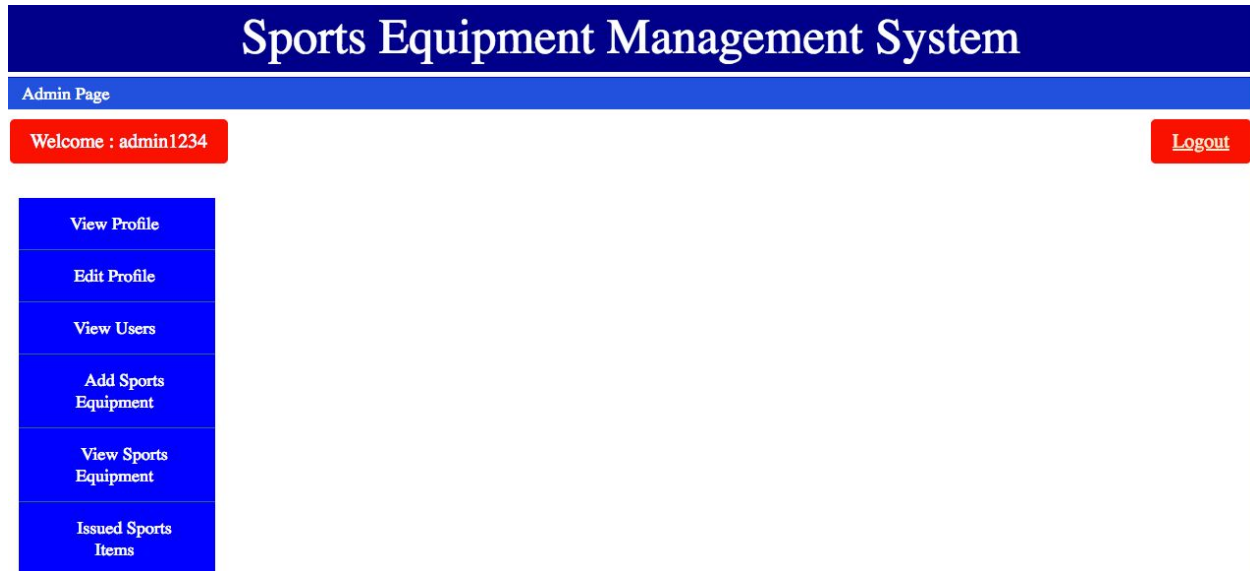
Log In

[Forgot Password?](#)

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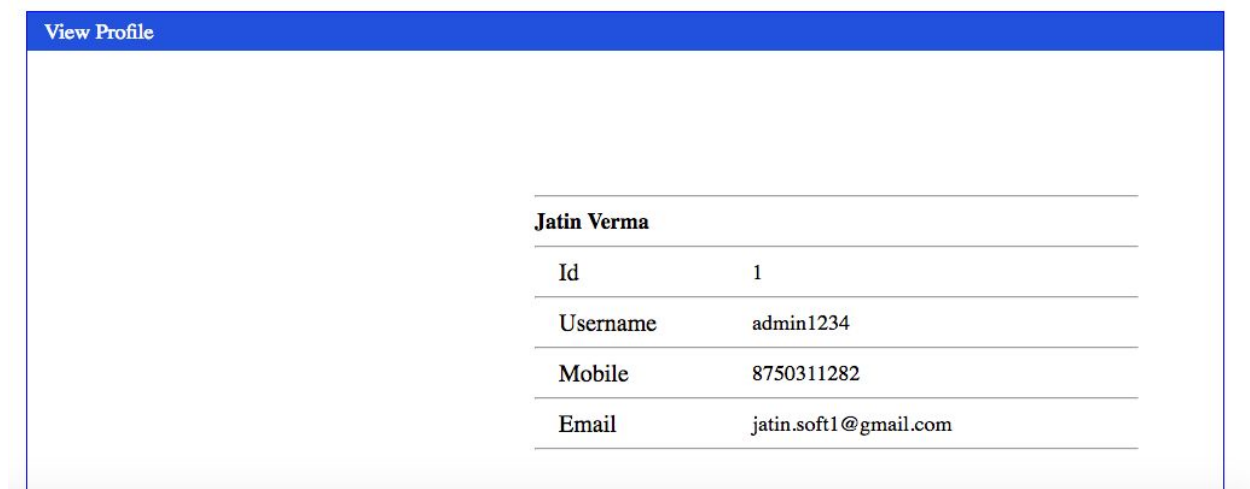
Above figure shows the homepage of our project, here we provide 3 menus, Register menu for first time users, Admin Login and Student Login. On clicking a particular menu they will be navigated to their respective login page.

2) Admin Area



Above figure shows the dashboard of admin, here admin/manager has 6 menus. On clicking a particular menu they will be navigated to their respective page.

1)View Profile:Manager/admin can view his/her profile



2)Edit Profile: Admin can edit his/her profile

Edit Profile

1

Jatin

Verma

admin1234

.....

jatin.soft1@gmail.com

Update

3) View users: Here admin can view all the registered users for this application

Member List

| Id | First Name | Last Name | Mobile |
|--------------------|------------|-----------|------------|
| 1 | Hitesh | Kumar | 8468907402 |
| 2 | Dipesh | Sharma | 9560989439 |
| 3 | Vivek | Krishna | 9891813716 |
| 4 | Jai | Mehra | 8468907402 |
| 5 | Abhishek | Kashyap | 8826036670 |
| 6 | Shashikant | Sharma | 9560989439 |
| 7 | Himanshu | Mavi | 8468907402 |
| 8 | Manoj | Gupta | 9878987898 |
| 9 | Aishwarya | Sharma | 8745324652 |
| 10 | Afzal | Faridi | 9834965393 |
| 11 | Divyansh | Verma | 8897345688 |
| 12 | Chinmay | Kunjam | 8792378090 |
| 13 | Bhoopesh | Paikara | 8997345611 |

5) Add sports equipment: Here, Admin can add new sports equipment.

Add-Sports-Equipment

Category Entry Date:

5)View Sports Equipment:

Admin can view all the sports items available in the stock and can update and delete also by clicking **Edit** and **Delete** Link respectively.

| Sports Equipment List | | | | | |
|--------------------------|-----------|---------------|--------------|----------------------|------------------------|
| Equipment Id | Category | Sport Item | Availability | Edit | Delete |
| BADMTN11 | Badminton | Rackets | 1 | Edit | Delete |
| BADMTN12 | Badminton | Shuttlecock | 2 | Edit | Delete |
| CRIC11 | Cricket | Bat | 3 | Edit | Delete |
| CRIC12 | Cricket | Ball | 2 | Edit | Delete |
| CRIC13 | Cricket | Stumps | 1 | Edit | Delete |
| FOOTB11 | Football | Football | 3 | Edit | Delete |
| FOOTB12 | Football | Football Nets | 3 | Edit | Delete |

6) Issued Sport Items:

This page shows all the issued sports items and the users who have borrowed. By clicking **Borrow_id** , admin will be directed to a page where he/she can view details of student,who have borrowed that sport item.

| Member List | | | | |
|--------------------|---------|--------------|------------|---------------|
| Borrow_id | User ID | Equipment ID | Item ID | Date of Issue |
| 14 | 13 | BADMTN11 | BADMTN11-1 | 2018-10-29 |
| 17 | 14 | CRIC12 | CRIC12-1 | 2018-10-29 |

3) Student Area



Above figure shows the dashboard of student, here student has 4 menus. On clicking a particular menu they will be navigated to their respective page.

1)View Profile:Student can view his/her profile

View Profile

Himanshu Nagdive

Id 15

Username himanshu

Mobile 7897345688

Email hn@gmail.com

2)Edit Profile: Student can edit his/her profile

Edit Profile

1

Jatin

Verma

admin1234

.....

jatin.soft1@gmail.com

Update

3)View Sports Equipment:

Student can view all the sports items available in the stock and can borrow also.

Sports Equipment List

| Equipment Id | Category | Sport Item | Availability |
|--------------------------|-----------|---------------|--------------|
| BADMTN11 | Badminton | Rackets | 1 |
| BADMTN12 | Badminton | Shuttlecock | 2 |
| CRIC11 | Cricket | Bat | 3 |
| CRIC12 | Cricket | Ball | 2 |
| CRIC13 | Cricket | Stumps | 1 |
| FOOTB11 | Football | Football | 3 |
| FOOTB12 | Football | Football Nets | 3 |

On clicking one of Equipment Ids , student will be redirected to a page where student can borrow sport item of a particular brand.

Suppose student clicks **CRIC11**,then page like below will appear where he/she can borrow sport item.

Sports Equipment Information

Bat[CRIC11]

| | |
|--------------|------------|
| Category | Cricket |
| Availability | 3 |
| Entry Date | 2018-10-29 |

| Item ID | Brand | No of Items | Borrow |
|----------|--------|-------------|------------------------|
| CRIC11-1 | MRF | 2 | Borrow |
| CRIC11-2 | Reebok | 2 | Borrow |
| CRIC11-3 | Adidas | 2 | Borrow |

4) Issued Sports Items:

Here Student can see all borrowed sports item by him/her and by clicking **Return**, that item will be returned.

Issued-Sports-Equipment

| Equipment ID | Item ID | Issue-Date | Return |
|--------------|------------|------------|------------------------|
| BADMTN12 | BADMTN12-1 | 2018-11-05 | Return |

6. Conclusion

This website provides a database based sports equipment management system which will benefit the students as well as the staff of the sports store. It makes entire process online where student can do sport item transactions.

There is a future scope of this facility that many features such as search facility of equipments can be added and user interface can be enhanced. Source code is readable and changes can be made easily.