# COURTMASTER – FOOTBALL COURT BOOKING SYSTEM

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## Executive Summary

The CourtMaster Football Court Booking System is a web-based management platform designed to streamline the booking, maintenance, and administrative processes of football court facilities. The system provides a centralized and user-friendly interface that allows customers to view available courts, make bookings, and manage their reservations. Administrators can efficiently handle scheduling, monitor maintenance slots, and analyze revenue trends on a daily, weekly, or monthly basis.

## Introduction / Background

Managing sports facilities manually can often lead to issues such as booking overlaps, time conflicts, and inefficient resource utilization. CourtMaster was developed to address these challenges by automating the booking process, ensuring seamless coordination between users and administrators, and improving the overall user experience. The system ensures transparency, convenience, and accuracy in managing football court reservations.

## Objectives / Scope

The primary objectives of CourtMaster are:

* To automate the booking and scheduling of football courts.
* To allow users to easily select available slots and book durations from 30 minutes to 3 hours.
* To give administrators control over court availability, bookings, and maintenance.
* To provide clear insights into financial performance through revenue tracking.
* To reduce scheduling conflicts and enhance operational efficiency.

## Tools & Technologies Used

• Frontend: HTML, CSS, JavaScript, Bootstrap  
• Backend: PHP (Procedural)  
• Database: MySQL (via XAMPP / phpMyAdmin)  
• Development Environment: Visual Studio Code  
• Server: Apache (via XAMPP)  
• Testing Tool: Postman for API testing

## Methodology / Approach

The system follows a modular and layered architecture, consisting of:

1. Frontend Interface: Designed using Bootstrap for responsiveness and user accessibility.
2. Backend Logic: Developed in PHP to handle server-side logic, database operations, and authentication.
3. Database Layer: MySQL is used for data flexibility, ensuring reliable handling of bookings, users, availability, and maintenance records.
4. Admin and User Roles: Two-level authentication system for separating privileges and functionalities.

## Implementation Details

CourtMaster consists of two main modules:

1. User Module – Users can register, log in, view available football courts, and book time slots based on their preferred duration. The pricing model dynamically adjusts according to the duration selected.
2. Admin Module – Administrators can add courts, set availability, manage maintenance periods, view and modify bookings, and monitor revenue through integrated reports.

The revenue tracking section displays daily, weekly, and monthly summaries to provide a financial overview.

## Results / Outputs

The system was successfully deployed in a local environment using XAMPP.   
Key achievements include:

* Fully functional admin and user dashboards.
* Real-time court availability and slot booking.
* Maintenance and conflict management for bookings.
* Automated price calculation and revenue reports.
* Secure login and logout system for both users and admins.

## Challenges Faced and Solutions

* Challenge: Overlapping bookings when multiple users booked the same slot.  
   Solution: Implemented time overlap validation logic using SQL conditions to prevent double bookings.
* Challenge: Displaying real-time availability after maintenance updates.  
   Solution: Integrated AJAX-based slot fetching to update user views dynamically.
* Challenge: Maintaining accurate revenue when bookings were marked as completed or cancelled.  
  Solution: Revenue now includes both confirmed and completed bookings for accurate reporting.

## Recommendations / Future Enhancements

To enhance CourtMaster and prepare it for real-world deployment, I would like to add/improve a few things such as follows:

1. **Online Payments Integration**  
   Add secure payment gateway support (e.g., PayPal) to enable online transactions and automatic invoice generation for confirmed bookings.
2. **Email and SMS Notifications (Maybe Whatsapp)**  
   Implement automated notifications for booking confirmations, cancellations, and reminders to improve user communication and reduce no-shows.
3. **Mobile Application**  
   Develop a mobile version of CourtMaster (Android/iOS) to allow users to book courts, view schedules, and manage their reservations conveniently on the go.
4. **Advanced Reporting & Analytics**  
   Provide detailed reports for admins, such as daily/weekly/monthly revenue summaries, booking trends, and court utilization statistics.
5. **Enhanced Security & Role Management**  
   Introduce multi-level admin access, enforce HTTPS, and improve security with input validation, rate limiting, and stronger authentication measures.
6. **Improved User Interface**Enhance the visuals of the website by adding background images.