CHAPTER 1

INTRODUCTION

1.1 PROBLEM STATEMENT

Traditional cricket scoring methods rely heavily on manual paper scorebooks and basic digital solutions, leading to numerous challenges in match management and statistical tracking. Scorers face difficulties in maintaining accurate ball-by-ball records, calculating complex statistics, and managing player performances in real-time. Additionally, the growing popularity of fantasy cricket creates a need for immediate statistical updates and point calculations. The current solutions often lack integration between match scoring and fantasy elements, resulting in delayed updates and poor user engagement.

1.2 OBJECTIVES

The Fantasy Cricket Scoring System provides comprehensive match management and fantasy cricket capabilities. The system allows match officials to record ball-by-ball scoring with automatic statistical calculations and fantasy point updates. Users can create fantasy teams before matches, selecting players within credit limits and designating captains/vice-captains. The scoring module handles all cricket scenarios including extras, dismissals, while maintaining detailed player statistics. Fantasy points are calculated in real-time based on player performances, with separate tracking for batting, bowling, and fielding achievements. The system ensures proper match state management across innings transitions and maintains data integrity through robust validation mechanisms.

1.3 SCOPE

The system encompasses complete match management functionality from team creation to match completion, including detailed statistical tracking and fantasy point calculations. It handles limited-overs cricket matches with support for:

- Real-time ball-by-ball scoring
- Comprehensive player statistics

- Fantasy team creation and management
- Live leaderboard updates
- Detailed match summaries
- Multi-user access control

CHAPTER 2
EXISTING AND PROPOSED MODEL

2.1 EXISTING MODEL

Traditional cricket scoring systems largely rely on manual methods and disconnected digital solutions. Paper scorebooks remain common but are prone to errors and lack real-time capabilities. Basic digital scoring apps offer limited functionality, operating in isolation without fantasy integration. These systems struggle with complex scoring scenarios and provide minimal statistical analysis. Current fantasy cricket platforms operate separately from live scoring systems, leading to delays in point calculations and limited player engagement. Digital solutions in the market offer basic scoring features but lack comprehensive match management capabilities. They often struggle with handling extras, partnership tracking, and detailed player statistics. The disconnect between scoring and fantasy platforms creates a gap in user experience, requiring manual data entry and delayed updates. Most existing systems lack proper validation mechanisms and don't support real-time data synchronization.

2.2 PROPOSED MODEL

The Fantasy Cricket Scoring System introduces an integrated approach combining real-time scoring with fantasy cricket features. Built using Flutter and Supabase, the system provides a seamless experience for both match officials and fantasy players. The scoring interface supports comprehensive match management, including detailed ball-by-ball recording, extras handling, and automatic statistical calculations.The system implements robust validation mechanisms to prevent scoring errors and maintain data integrity. Match officials can easily record complex scenarios like extras, wickets, and partnerships, while the system automatically updates all relevant statistics. Fantasy players benefit from immediate point calculations based on live match events. The architecture supports multiple concurrent matches and users, with proper state management and error handling.The technical implementation leverages Flutter's widget system for a responsive interface and Supabase's real-time capabilities for instant data updates. The system maintains complete match states, handles innings transitions, and provides comprehensive statistical analysis. This integrated approach eliminates the traditional gap between scoring and fantasy platforms, creating a more engaging cricket experience for all users.

CHAPTER 3

SYSTEM DESIGN

3.1 SOFTWARE REQUIREMENTS SPECIFICATION

3.1.1 Introduction

3.1.1.1 Purpose

The Fantasy Cricket Scoring System aims to revolutionize cricket match management by combining real-time scoring capabilities with fantasy sports features. This system provides a comprehensive platform for cricket enthusiasts to score matches accurately while participating in fantasy cricket competitions.

3.1.1.2 Scope

The system encompasses:

- Real-time cricket match scoring and management
- Fantasy team creation and management
- Player performance tracking and statistics
- Live fantasy points calculation
- Comprehensive match analytics
- Multi-user access with role-based permissions

3.1.1.3 References

1. Cricket Laws (MCC): https://www.lords.org/mcc/the-laws-of-cricket
2. Flutter Documentation: https://flutter.dev/docs
3. Supabase Documentation: https://supabase.com/docs
4. Fantasy Sports Guidelines: https://fifs.in/guidelines/

3.1.1.4 Overview

This document provides detailed specifications for:

- System architecture and components
- User interface requirements
- Database structure
- Security implementations

- Performance metrics
- Integration requirements

3.1.2 OVERALL DESCRIPTION

3.1.2.1 Product Perspective

The system operates as a mobile application with:

- Flutter-based frontend for cross-platform compatibility
- Supabase backend for real-time data management
- PostgreSQL database for data persistence
- WebSocket connections for live updates
- Email integration for notifications
- Secure authentication system

3.1.2.2 Product Functions

Match Management

Real-time cricket scoring takes place through an intuitive interface where officials can record ball-by-ball action. Each delivery can be marked as a regular ball, wide, no-ball, or dead ball. Runs are recorded through quick-tap buttons (0-6), with additional options for extras like byes and leg-byes.

The system automatically tracks overs, maintaining proper sequencing and enforcing bowling restrictions. When wickets fall, officials can select from multiple dismissal types and record relevant fielder and bowler contributions.

Fantasy Integration

Users create fantasy teams within a 100-credit budget constraint. Each player has a credit value based on their past performance and current form. Teams must include a valid combination of batsmen, bowlers, wicket-keepers, and all-rounders.

Points are calculated automatically as the match progresses. Batting points accumulate for runs scored, with bonuses for high strike rates and milestones. Bowling points reward wickets and economical spells, while fielding points cover catches, run-outs, and stumpings.

Statistical Analysis

The system maintains comprehensive statistics for every player, including batting averages, bowling figures, and fielding records. Match data is analyzed to generate insights like partnership breakdowns, wagon wheels, and Manhattan graphs.

Live projections help teams track required run rates and target probabilities. Historical data feeds into player rankings and helps determine fantasy player valuations for future matches.

User Experience

A clean, responsive interface ensures smooth operation during high-pressure match situations. Quick-action buttons and gesture controls speed up common scoring tasks. Real-time validation prevents common scoring errors while helpful tooltips guide new users.

Reporting and Analytics

Post-match reports compile key statistics and memorable moments. Fantasy team owners receive detailed breakdowns of their players' performances. League administrators can access comprehensive match and player databases for tournament management.

3.1.2.3 User Characteristics

Match Officials

Match officials interact with the core scoring functionality. They require:

Technical Proficiency:

- Basic smartphone operation skills
- Ability to navigate touch interfaces
- Understanding of menu-driven applications

Domain Knowledge:

- Comprehensive cricket rules understanding
- Familiarity with scoring conventions

- Knowledge of different match formats
- Quick decision-making ability

Fantasy Players

Fantasy players primarily engage with team creation and points tracking. They need:

Game Understanding:

- Basic cricket knowledge
- Strategy development skills
- Understanding of player statistics
- Familiarity with fantasy sports concepts

Technical Requirements:

- Email account for registration
- Stable internet connection
- Compatible mobile device
- Basic app navigation skills

System Administrators

Administrators manage the overall system operation. They require:

Technical Skills:

- Database management knowledge
- User account administration
- System monitoring capabilities
- Performance optimization experience

3.1.2.4 Constraints

Technical Constraints

The system operates within these limitations:

Hardware Requirements:

Minimum Device Specifications:

- RAM: 4GB
- Storage: 64GB
- Processor: 1.6 GHz dual-core
- Network: 4G/WiFi
- Screen: 5" HD display

Software Limitations:

Platform Requirements:

- Android 6.0 or higher
- iOS 12.0 or higher
- Flutter SDK 3.0+
- Supabase infrastructure limits

3.1.2.5 Assumptions and Dependencies

Assumptions

User Assumptions

- Users have basic knowledge to operate a mobile device
- Users possess valid email accounts for authentication
- Users have stable internet connectivity for login and verification
- Users can understand basic English interface elements
- Users will verify their email addresses when registering

Technical Assumptions

- Mobile devices meet these minimum requirements:
- Android 6.0 or iOS equivalent
- 4GB RAM
- Stable internet connection
- Basic touchscreen functionality

- Users maintain current versions of the application
- Device time settings are accurate for proper authentication

Dependencies

Core Dependencies

External Services:

- Supabase Authentication Service
- Supabase Real-time Database
- Email Service Provider

Development Framework:

- Flutter SDK 3.0+
- Dart 2.17+
- Material Design Components

Required Packages:

- supabase_flutter: For authentication
- simple_animations: For UI animations
- flutter_material: For UI components

System Dependencies

- Active Supabase project instance
- Configured authentication providers
- Email service for verification
- Proper environment variables setup
- SSL certificates for secure connections

User Interface Dependencies

- Material Design theme configuration
- Custom animation controllers
- Form validation logic
- Error handling mechanisms
- State management system

3.1.3 Functional and Non-Functional Requirements

3.1.3.1 Functional Requirements

Authentication System

The system shall implement a secure email-based authentication using Supabase integration, including email verification flows, password validation, and session management with proper error handling and user feedback mechanisms.

Login Form Validation

The system shall validate all form inputs in real-time, including email format verification with regex patterns, required field validation, and password strength requirements before allowing form submission.

Error Handling

The system shall provide comprehensive error handling for authentication failures, network issues, and validation errors, displaying user-friendly error messages through a dedicated error message display area.

Visual Feedback

The system shall provide immediate visual feedback for all user interactions, including loading states during authentication, success animations for successful operations, and error indicators for failed actions.

Session Management

The system shall maintain secure user sessions using JWT tokens, handle session timeouts appropriately, and provide proper session cleanup on logout or application closure.

Navigation Control

The system shall manage secure navigation between authentication states, including redirection to home page after successful login and proper handling of back navigation and state persistence.

Email Verification

The system shall enforce email verification before allowing access to protected routes, with functionality to resend verification emails and proper status checking.

Form State Management

The system shall maintain form state throughout the authentication process, preserve user inputs during validation, and clear sensitive data upon successful authentication or manual reset.

Animation System

The system shall implement a sophisticated animation system including background animations with rotating circles, form transitions, and loading state animations to enhance user experience.

Social Login Interface

The system shall provide a structured interface for future social login integrations while clearly communicating current limitations to users.

3.1.3.2 Non-Functional Requirements

Performance

The system shall maintain smooth animations at 60 FPS, process form submissions within 300ms, and complete authentication requests within 3 seconds under normal network conditions.

Security

The system shall implement secure password handling, protect against XSS attacks, sanitize all user inputs, and maintain secure communication channels using SSL/TLS encryption.

Reliability

The system shall maintain 99.9% uptime for authentication services, handle network interruptions gracefully, and preserve user data integrity throughout all operations.

Usability

The system shall provide clear user feedback, maintain consistent UI elements, offer intuitive navigation, and ensure accessibility standards compliance.

Responsiveness

The system shall adapt to different screen sizes, maintain proper layouts from 320px to 2560px width, and handle orientation changes smoothly.

Resource Efficiency

The system shall optimize memory usage during animations, properly dispose of controllers and animations, and maintain efficient widget rebuilding strategies.

Code Quality

The system shall maintain clean architecture principles, follow Flutter best practices, and implement proper documentation for all complex logic.

Error Recovery

The system shall implement automatic retry mechanisms for failed network requests, preserve user inputs during errors, and provide clear recovery paths.

Compatibility

The system shall function consistently across Android 6.0+ and iOS 12.0+ devices, maintaining feature parity across platforms.

Maintainability

The system shall implement modular code structure, maintain clear separation of concerns, and follow consistent naming conventions for future maintainability.

3.1.4 Glossory

AnimatedBackgroundPainter : A custom painting class that draws and manages the animated circular patterns in the login screen background.

TextEditingController : A controller class that manages text input state for email and password fields in the login form.

StatefulWidget : A Flutter widget class that maintains changeable (mutable) state, used as the base for the login page.

BuildContext : A locator that keeps track of where a widget is positioned in the widget tree structure.

CustomPaint : A widget that provides a canvas on which custom shapes can be drawn, used for the animated background.

TickerProviderStateMixin : A mixin that provides the vsync ticker for animations, ensuring they remain efficient and synchronized with the screen refresh rate.

LinearGradient : A gradient that interpolates colors along a line, used in the login button's background.

CurvedAnimation : An animation that applies a non-linear curve to transform how the animation progresses over time.

AuthException : A Supabase-specific error type that handles authentication-related errors during login attempts.

MaterialPageRoute : A modal route that replaces the entire screen with a platform-adaptive transition animation when navigating between pages.

3.2 UML DIAGRAMS

3.2.1 Activity Diagram

The Activity Diagram is a UML component that focuses on modeling the flow of activities or processes, showcasing sequences, decisions, and parallel tasks within a system. It is widely used for visualizing workflows in software development and business processes. The activity diagram for this Fantasy Cricket Application is depicted in Figure 3.1 illustrates user flows such as authentication (login/sign-up), match creation, joining contests, live match updates, and fantasy point calculations. It incorporates decision points (e.g., user existence, match scheduling) and parallel processes like updating scores or submitting teams, ensuring a streamlined user experience.

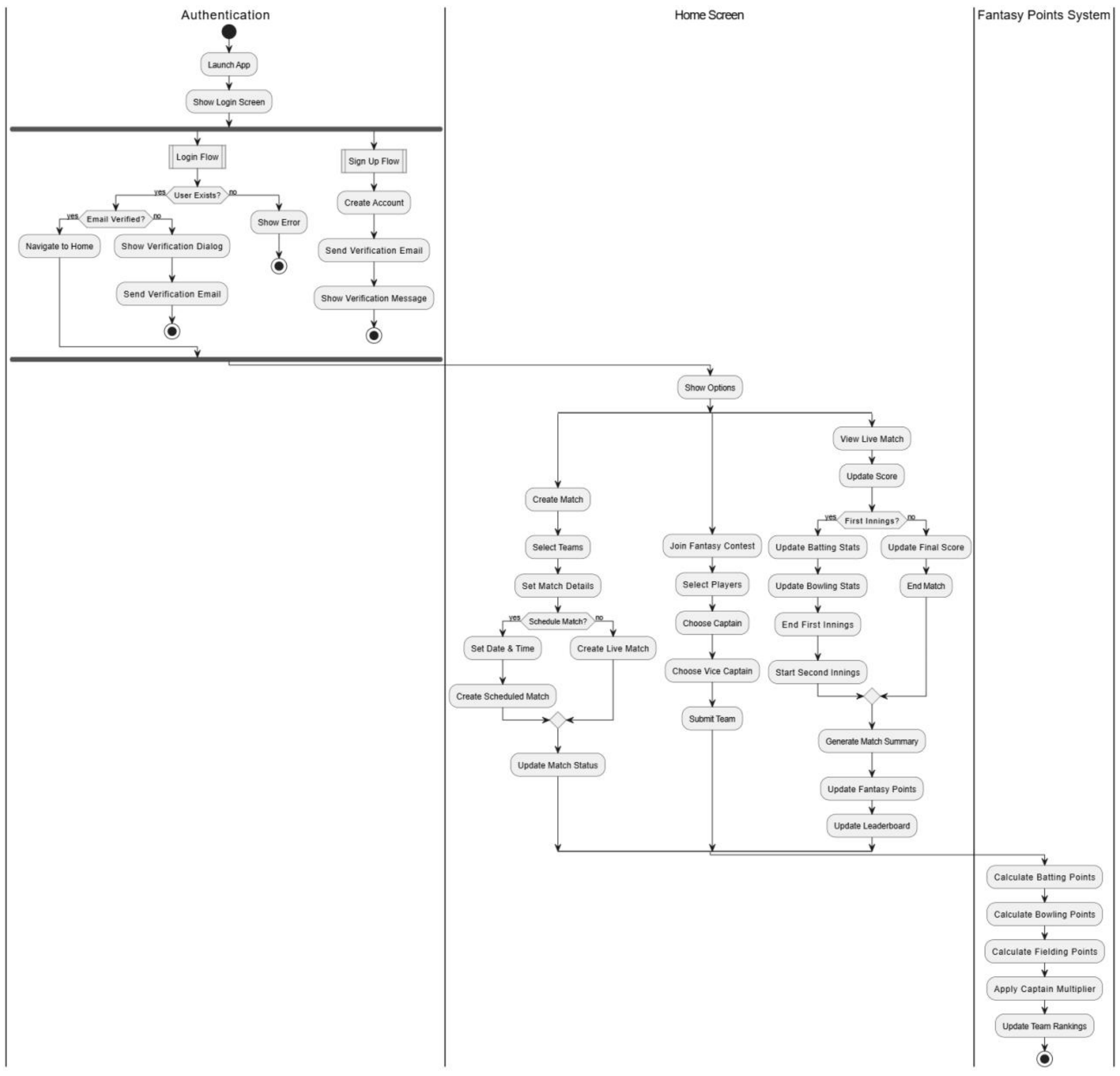


Figure 3.1: Activity Diagram for Fantasy Cricket Application

3.2.2 Sequence Diagram

The sequence diagram illustrates the interaction between objects/components over time through message exchanges. For this Fantasy Cricket Application, Figure 3.2 shows flows like user authentication, creating matches, joining contests, live match updates, and calculating fantasy points, emphasizing the order and communication between UI, server, database, and APIs.

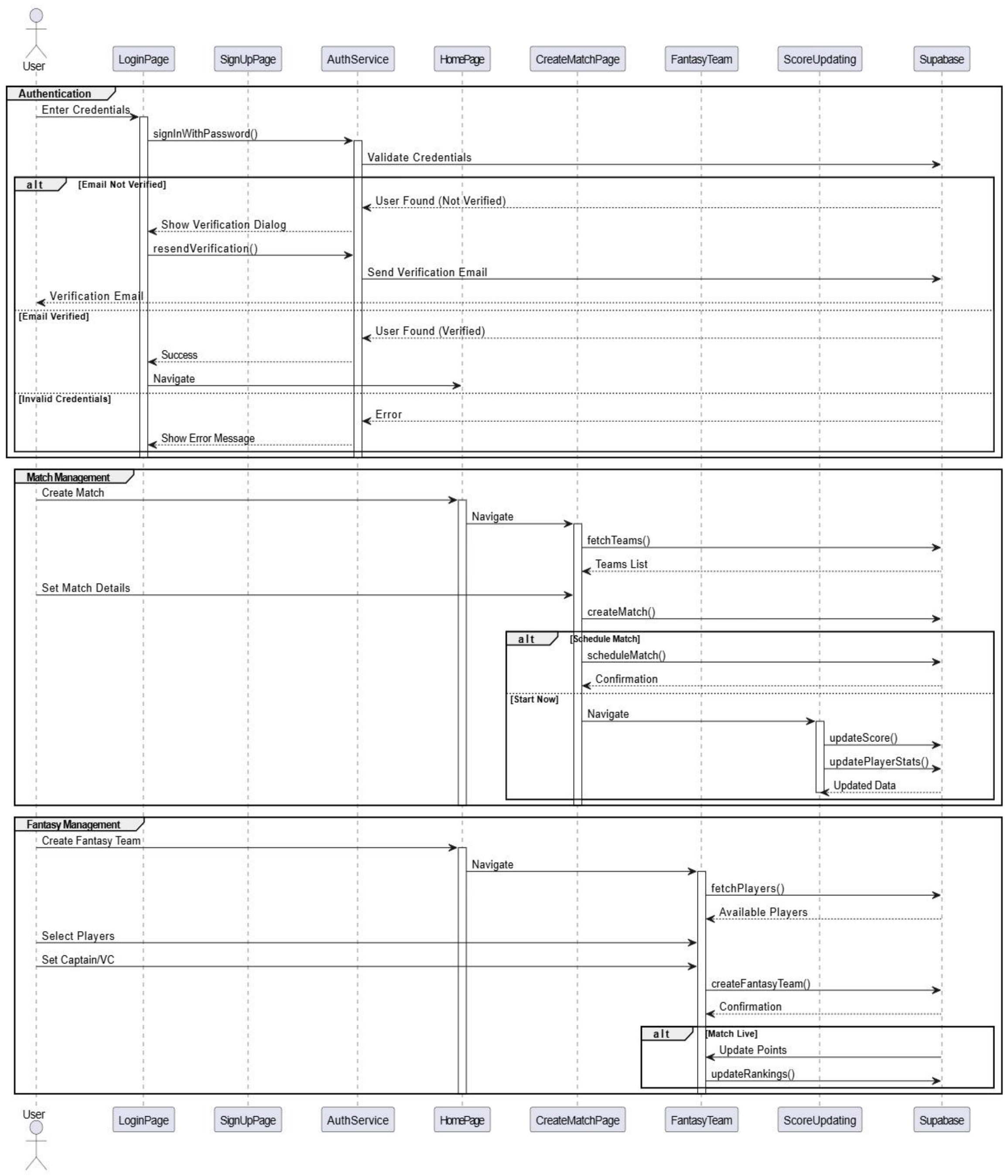


Figure 3.2: Sequence Diagram for Fantasy Cricket Application

3.2.3 Class Diagram

The class diagram represents the static structure of a system, showcasing its classes, attributes, methods, and relationships. For this Fantasy Cricket Application, it includes classes like User, Match, Team, Player, and FantasyPoints with associations such as User-Manages-Team, Match-Includes-Team, and Player-Has-Stats as represented in Figure 3.3.

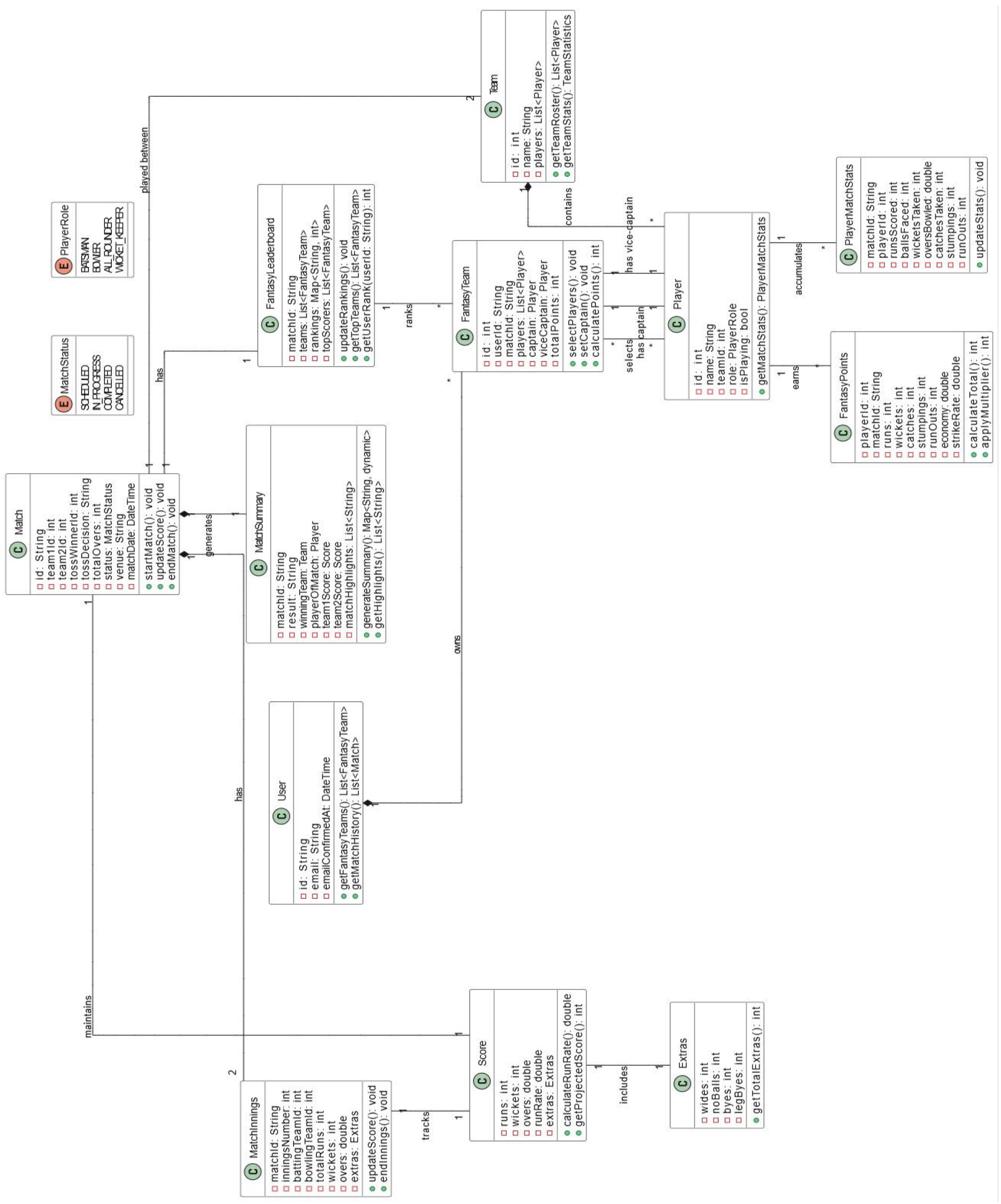


Figure 3.3: Class Diagram for Fantasy Cricket Application

3.2.4 Flow Diagram

A flow diagram visually outlines the step-by-step sequence of a process using shapes like arrows for flow, rectangles for actions, and diamonds for decisions. For this Fantasy Cricket Application, it begins with user actions like launching the app, followed by authentication (login or signup), leading to options like creating matches, joining contests, and viewing live matches. Each process branches into specific tasks, such as scheduling matches, selecting players, updating scores, calculating fantasy points, and updating leaderboards as given in Figure 3.4. The diagram ensures clarity in workflows, dependencies, and decision points, making it easier to understand and optimize the application's processes.

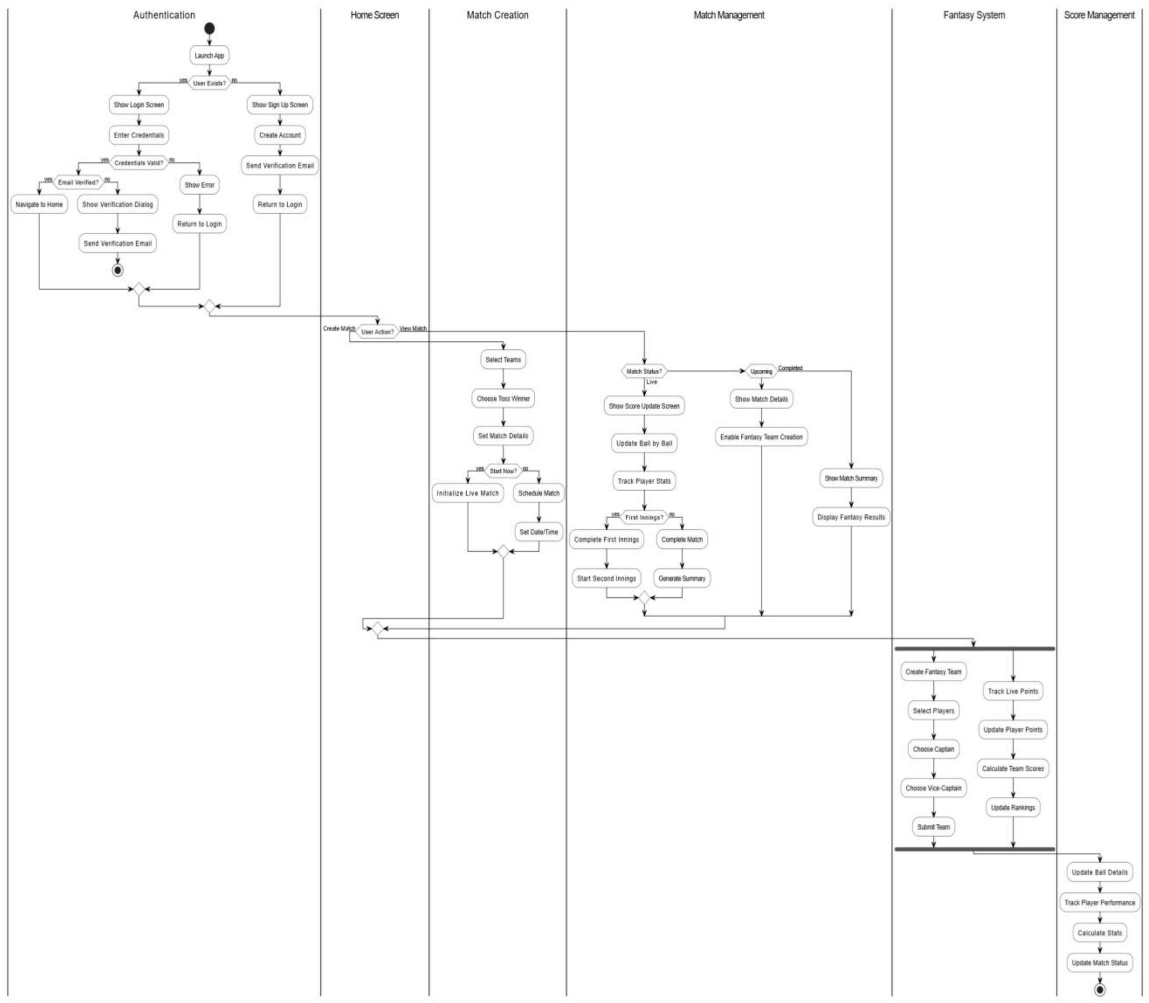


Figure 3.4: Flow Diagram for Fantasy Cricket Application

3.2.5 Use Case Diagram

A use case diagram represents the interactions between users (actors) and the system, focusing on the functionalities provided. For this Fantasy Cricket Application, it includes use cases like user authentication, match creation, joining contests, viewing live matches, and calculating fantasy points, with actors like users, admins, and the system as given in Figure 3.5.

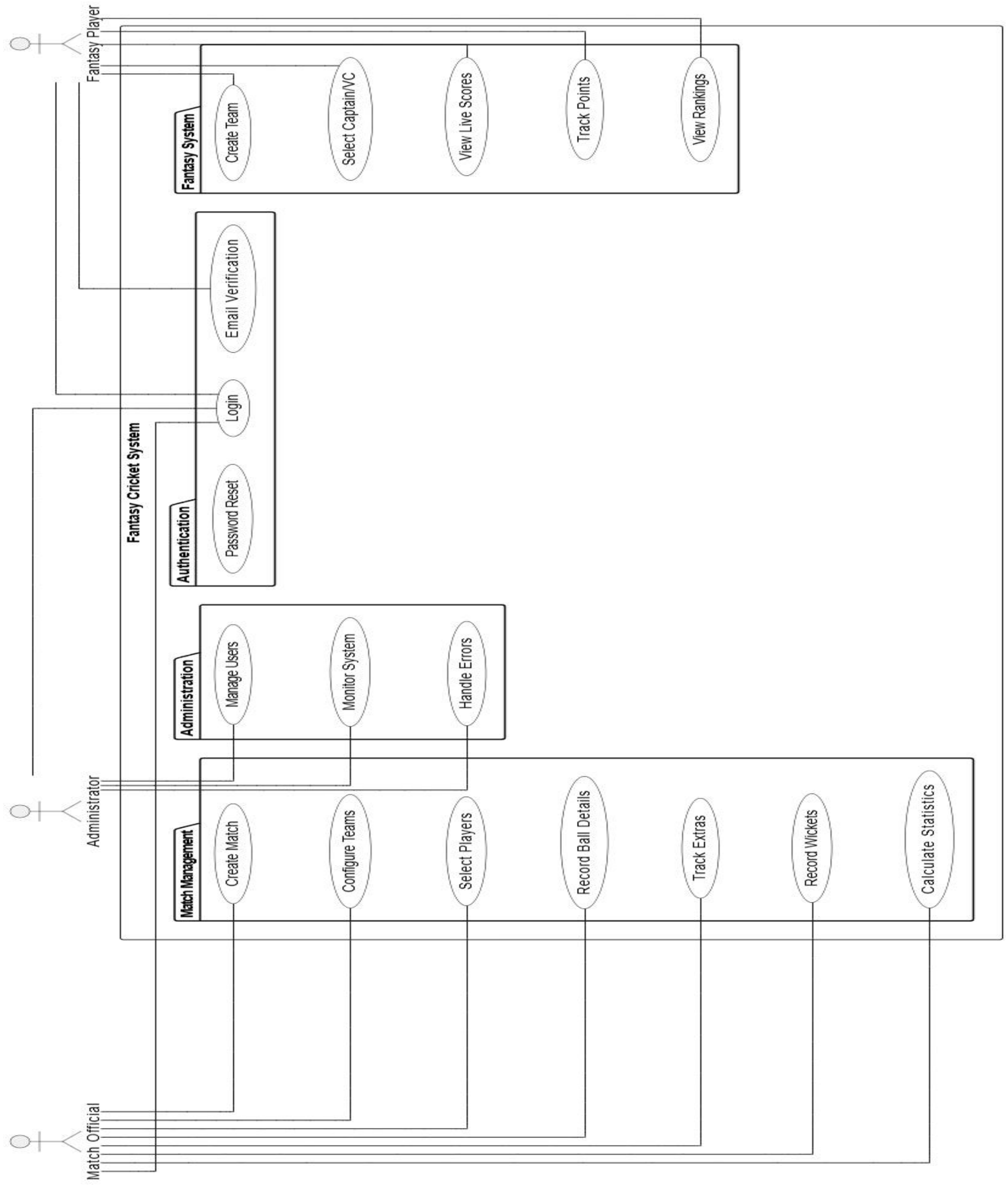


Figure 3.5: Use Case Diagram for Fantasy Cricket Application

3.2.6 Schema Diagram

A schema diagram visually represents the structure of a database, focusing on entities and their relationships. For this Fantasy Cricket Application, it shows entities like Users, Matches, Teams, Players, and FantasyPoints, along with their relationships, such as Users managing Teams and Teams participating in Matches as in Figure 3.6.

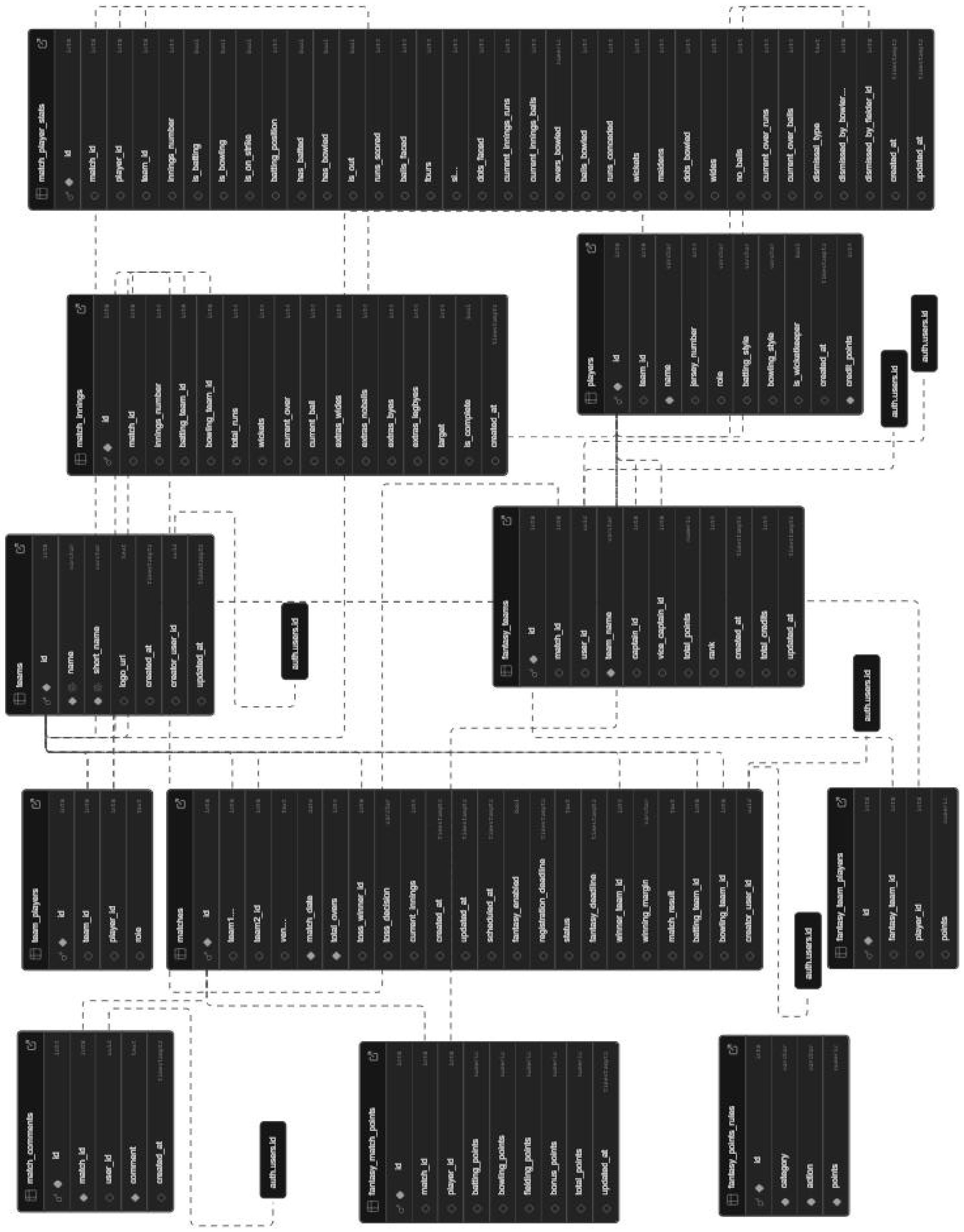


Figure 3.6: Schema Diagram for Fantasy Cricket Application

3.3 DESIGN COMPONENTS

3.3.1 Front End:

The Fantasy Cricket Scoring Application uses the following for developing interactive pages.

Framework: Flutter (v3.0+)

Language: Dart

Key Components:

Material Design widgets

Custom animations

Form validation

State management

3.3.2 Back End:

The backend for the application is being handled by,

Platform: Supabase

Services:

Authentication system

PostgreSQL database

Real-time data sync

Row level security

3.4 DATABASES DESCRIPTION

The Fantasy Cricket Scoring Application's database schema efficiently organizes data for matches, teams, players, and user interactions. It ensures data integrity through structured tables with constraints, facilitates real-time updates, and supports efficient querying, enabling seamless functionality and scalability.

Listed below gives a description of database document schemas used for the Fantasy Cricket Scoring Application

The Table 3.1 tracks and stores players' performance points in a specific match, categorized by batting, bowling, fielding, bonuses, and totals.

Table 3.1 Fantasy Match Points Table

Attribute Name	**Width**	**Type**	**Constraints**	**Description**
id	8	bigserial	PRIMARY KEY	Points record identifier
match_id	8	bigint	FOREIGN KEY, UNIQUE composite	Reference to matches table
player_id	8	bigint	FOREIGN KEY, UNIQUE composite	Reference to players table
batting_points	10,2	numeric	DEFAULT 0	Points earned from batting
bowling_points	10,2	numeric	DEFAULT 0	Points earned from bowling
fielding_points	10,2	numeric	DEFAULT 0	Points earned from fielding
bonus_points	10,2	numeric	DEFAULT 0	Additional bonus points
total_points	10,2	numeric	DEFAULT 0	Sum of all points earned
updated_at	-	timestamp	DEFAULT now()	Last update timestamp

The Table 3.2 defines the scoring rules by specifying categories, actions, and the corresponding points awarded for each action.

Table 3.2 Fantasy Points Rules Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigserial	PRIMARY KEY	Rule identifier
category	50	varchar	NOT NULL, UNIQUE composite	Points category (e.g., batting, bowling)
action	100	varchar	NOT NULL, UNIQUE composite	Specific scoring action
points	5,2	numeric	NOT NULL	Points awarded for the action

The Table 3.3 represents user-created fantasy teams, linking them to matches, users, and players, while tracking team details like name, captain, vice-captain, points, rank, and credits.

Table 3.3 Fantasy Teams Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigserial	PRIMARY KEY	Fantasy team identifier
match_id	8	bigint	FOREIGN KEY	Reference to match
user_id	-	uuid	FOREIGN KEY, UNIQUE composite	Reference to auth.users
team_name	100	varchar	NOT NULL, UNIQUE composite	Fantasy team name
captain_id	8	bigint	FOREIGN KEY	Reference to captain
vice_captain_id	8	bigint	FOREIGN KEY	Reference to vice-captain
total_points	10,2	numeric	DEFAULT 0	Total team points
rank	-	integer	No constraint	Team ranking
created_at	-	timestamp	DEFAULT now()	Creation timestamp
total_credits	-	integer	DEFAULT 0	Total credits used
updated_at	-	timestamp	DEFAULT now()	Updated time

The Table 3.4 links players to fantasy teams and tracks the points earned by each player within a team.

Table 3.4 Fantasy Team Players Table

Attribute Name	**Width**	**Type**	**Constraints**	**Description**
id	8	bigserial	PRIMARY KEY	Player entry identifier
fantasy_team_id	8	bigint	FOREIGN KEY, UNIQUE composite, CASCADE on delete	Reference to fantasy team
player_id	8	bigint	FOREIGN KEY, UNIQUE composite	Reference to player
points	10,2	numeric	DEFAULT 0	Points earned by player

The Table 3.5 stores user-submitted comments for matches, associating each comment with a specific match and user, along with its creation timestamp.

Table 3.5 Match Comments Table

Attribute Name	**Width**	**Type**	**Constraints**	**Description**
id	4	serial	PRIMARY KEY	Comment identifier
match_id	8	bigint	FOREIGN KEY, NOT NULL, CASCADE on delete	Reference to match
user_id	-	uuid	FOREIGN KEY, CASCADE on delete	Reference to auth.users
comment	-	text	NOT NULL	Comment content
created_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Creation timestamp

The Table 3.6 records comprehensive statistics for each player's performance in a match, covering batting, bowling, fielding, and dismissal details, along with timestamps for record updates.

Table 3.6 Match Player Statistics Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigserial	PRIMARY KEY	Statistics identifier
match_id	8	bigint	FOREIGN KEY, UNIQUE composite	Match reference
player_id	8	bigint	FOREIGN KEY, UNIQUE composite	Player reference
team_id	8	bigint	FOREIGN KEY	Team reference
innings_number	-	integer	CHECK [1,2], UNIQUE composite	Innings number
is_batting	-	boolean	DEFAULT false	Current batting status
is_bowling	-	boolean	DEFAULT false	Current bowling status
is_on_strike	-	boolean	DEFAULT false	On strike status
batting_position	-	integer	No constraint	Batting order position
has_batted	-	boolean	DEFAULT false	Has batted flag
has_bowled	-	boolean	DEFAULT false	Has bowled flag
is_out	-	boolean	DEFAULT false	Dismissal status
runs_scored	-	integer	DEFAULT 0	Total runs scored
balls_faced	-	integer	DEFAULT 0	Total balls faced
fours	-	integer	DEFAULT 0	Number of boundaries
sixes	-	integer	DEFAULT 0	Number of sixes
dots_faced	-	integer	DEFAULT 0	Dot balls faced
current_innings_runs	-	integer	DEFAULT 0	Current innings runs
current_innings_balls	-	integer	DEFAULT 0	Current innings balls
overs_bowled	4,1	numeric	DEFAULT 0	Overs bowled
balls_bowled	-	integer	DEFAULT 0	Total balls bowled
runs_conceded	-	integer	DEFAULT 0	Runs given while bowling
wickets	-	integer	DEFAULT 0	Wickets taken
maidens	-	integer	DEFAULT 0	Maiden overs bowled
dots_bowled	-	integer	DEFAULT 0	Dot balls bowled

Attribute Name	Width	Type	Constraints	Description
wides	-	integer	DEFAULT 0	Wide balls bowled
no_balls	-	integer	DEFAULT 0	No balls bowled
current_over_runs	-	integer	DEFAULT 0	Current over runs
current_over_balls	-	integer	DEFAULT 0	Balls in current over
dismissal_type	-	text	No constraint	How player got out
dismissed_by_bowler_id	8	bigint	FOREIGN KEY	Bowler who took wicket
dismissed_by_fielder_id	8	bigint	FOREIGN KEY	Fielder who took catch/stumping
created_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Record creation time
updated_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Last update time

The Table 3.7 stores detailed information about cricket matches, including team references, venue, date, overs, toss details, status, and fantasy-related deadlines.

Table 3.7 Matches Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigserial	PRIMARY KEY	Match identifier
team1_id	8	bigint	FOREIGN KEY	First team reference
team2_id	8	bigint	FOREIGN KEY	Second team reference
venue	-	text	No constraint	Match venue
match_date	-	date	NOT NULL	Match date
total_overs	-	integer	NOT NULL, CHECK > 0	Number of overs
toss_winner_id	8	bigint	FOREIGN KEY	Toss winning team
toss_decision	4	varchar	CHECK ['bat','bowl']	Toss winner's choice
current_innings	-	integer	DEFAULT 1, CHECK [1,2]	Current innings number
created_at	-	timestam	DEFAULT	Creation

Attribute Name	Width	Type	Constraints	Description
		p	CURRENT_TIMESTAMP	time
updated_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Last update time
scheduled_at	-	timestamp	No constraint	Match schedule time
fantasy_enabled	-	boolean	DEFAULT true	Fantasy status
registration_deadline	-	timestamp	No constraint	Team registration cutoff
status	-	text	DEFAULT 'draft', CHECK ['draft','scheduled','in_progress','completed','cancelled']	Match status
fantasy_deadline	-	timestamp	No constraint	Fantasy team creation deadline
winner_team_id	-	integer	FOREIGN KEY	Winning team reference
winning_margin	100	varchar	No constraint	Victory margin details
match_result	-	text	No constraint	Match result description
batting_team_id	8	bigint	FOREIGN KEY	Current batting team
bowling_team_id	8	bigint	FOREIGN KEY	Current bowling team
creator_user_id	-	uuid	FOREIGN KEY	Match creator reference

The Table 3.8 stores detailed information about individual players, including their team, name, jersey number, role, playing styles, wicketkeeping status, fantasy credit value, and record timestamps.

Table 3.8 Players Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigserial	PRIMARY KEY	Player identifier
team_id	8	bigint	FOREIGN KEY, CASCADE on delete	Team reference

Attribute Name	Width	Type	Constraints	Description
name	100	varchar	NOT NULL	Player's full name
jersey_number	-	integer	UNIQUE composite with team_id	Player's jersey number
role	50	varchar	CHECK ['Batsman','Bowler','All-rounder','Wicket Keeper']	Player's primary role
batting_style	50	varchar	No constraint	Player's batting style
bowling_style	50	varchar	No constraint	Player's bowling style
is_wicketkeeper	-	boolean	DEFAULT false	Wicketkeeper indicator
created_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Record creation time
credit_points	-	integer	NOT NULL, DEFAULT 8, CHECK (≥4 AND ≤12)	Fantasy credit value

The Table 3.9 links players to teams, identifying their role within the team and referencing both the team and player entities.

Table 3.9 Team Players Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigint	PRIMARY KEY	Team player entry identifier
team_id	8	bigint	FOREIGN KEY (2 refs)	Reference to team
player_id	8	bigint	FOREIGN KEY (2 refs)	Reference to player
role	-	text	No constraint	Player's role in team

The Table 3.10 stores information about cricket teams, including their full name, abbreviation, logo URL, creator, and timestamps for creation and updates.

Table 3.10 Teams Table

Attribute Name	Width	Type	Constraints	Description
id	8	bigserial	PRIMARY KEY	Team identifier
name	100	varchar	NOT NULL, UNIQUE	Team full

Attribute Name	Width	Type	Constraints	Description
				name
short_name	10	varchar	NOT NULL, UNIQUE	Team abbreviation
logo_url	-	text	No constraint	Team logo URL
created_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Creation timestamp
creator_user_id	-	uuid	FOREIGN KEY	Creator reference
updated_at	-	timestamp	DEFAULT CURRENT_TIMESTAMP	Last update time

3.5 User Interface Design

Figure 3.7 showcases the user interface design for the login page, emphasizing simplicity and usability. It includes fields for username, password, and an option for secure authentication.

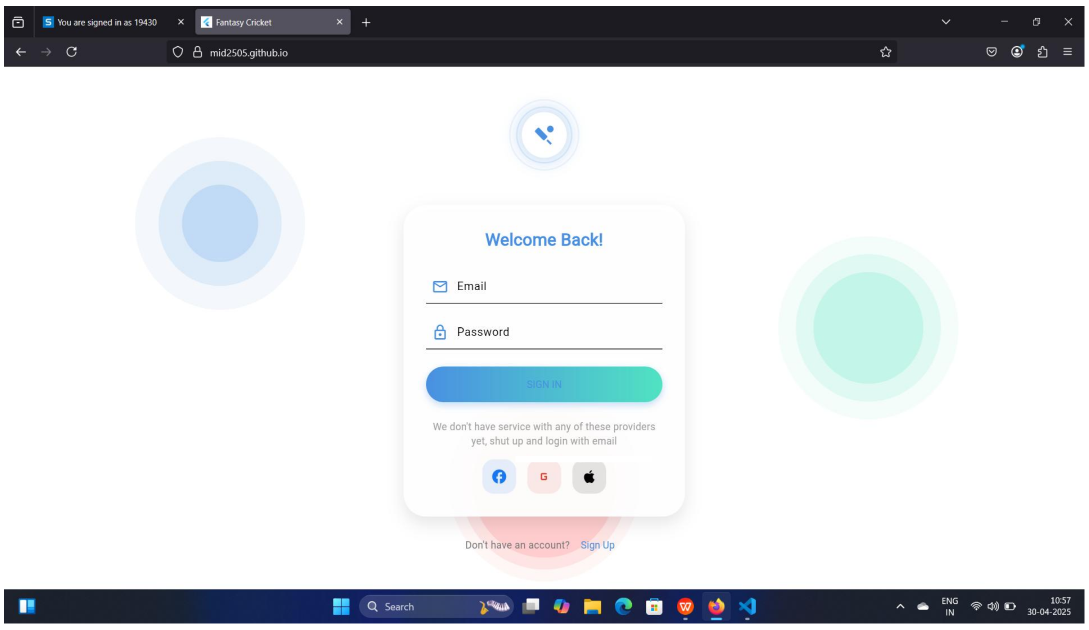

You are signed in as 19430
Fantasy Cricket
mid2505.github.io
Welcome Back!
Email
Password
SIGN IN
We don't have service with any of these providers yet, shut up and login with email
Don't have an account? Sign Up
Search
ENG IN
10:57
30-04-2025

Figure 3.7: Interface for Login Page

Figure 3.8 illustrates the user interface design for the home page, which provides redirection options for viewing matches, creating a match, or managing a team.

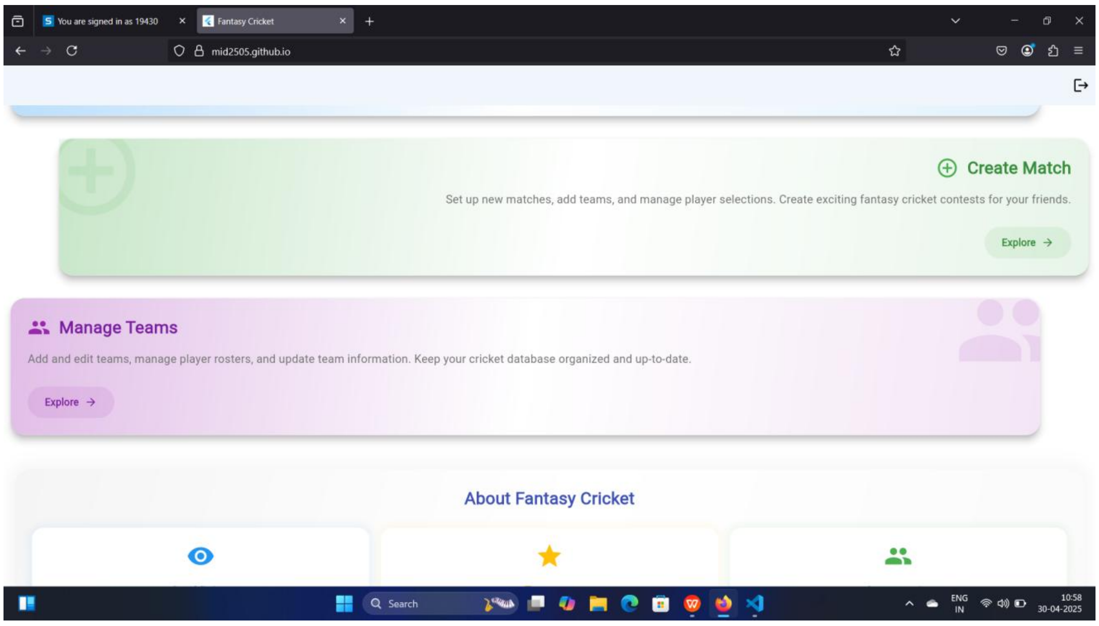

You are signed in as 19430
Fantasy Cricket
mid2505.github.io
Create Match
Set up new matches, add teams, and manage player selections. Create exciting fantasy cricket contests for your friends.
Explore
Manage Teams
Add and edit teams, manage player rosters, and update team information. Keep your cricket database organized and up-to-date.
Explore
About Fantasy Cricket

Figure 3.8: Interface for Home Page

Figure 3.9 illustrates the user interface design for viewing matches, providing a detailed list of ongoing, upcoming, and completed matches with options to view match details and statistics.

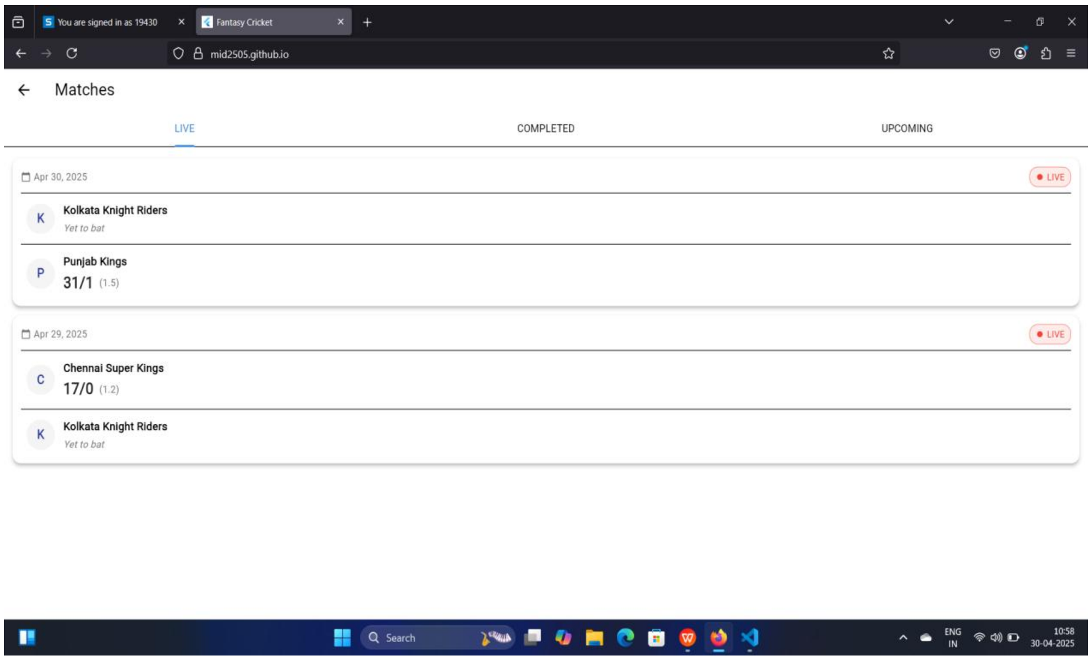
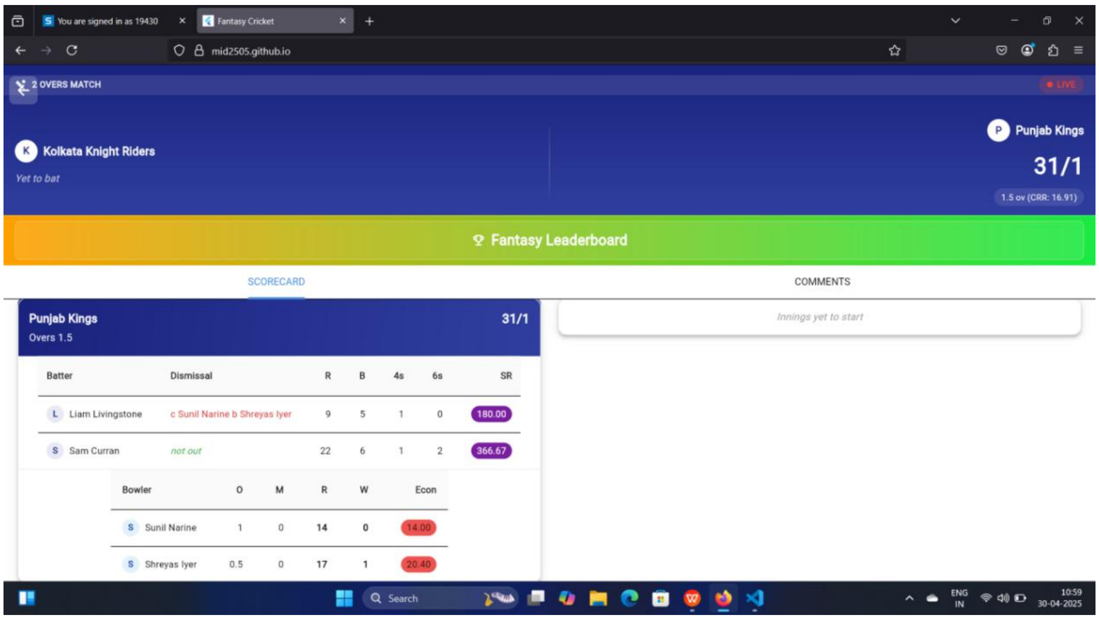


Figure 3.9 Interface for Viewing matches

Figure 3.10 illustrates the user interface design for the live score viewing page, providing real-time updates on the match score, including runs, wickets, overs, and player performance statistics.



Kolkata Knight Riders
Yet to bat

Punjab Kings
31/1
1.5 ov (CRR: 16.91)

Punjab Kings 31/1
Overs 1.5

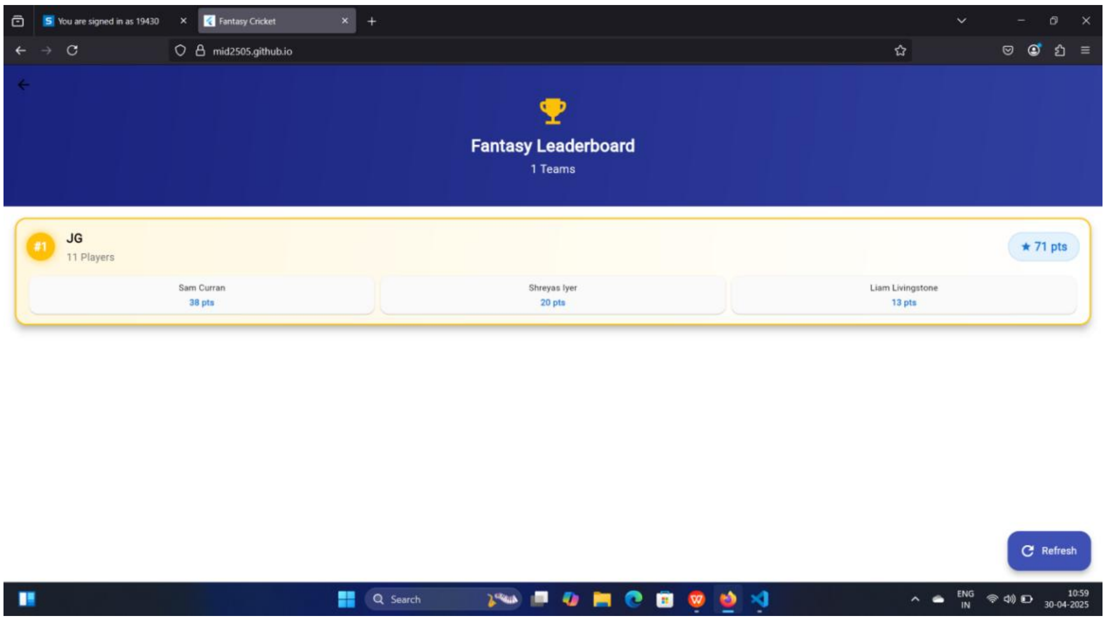
Batter	Dismissal	R	B	4s	6s	SR
Liam Livingstone	c Sunil Narine b Shreyas Iyer	9	5	1	0	180.00
Sam Curran	not out	22	6	1	2	366.67

Bowler	O	M	R	W	Econ
Sunil Narine	1	0	14	0	14.00
Shreyas Iyer	0.5	0	17	1	20.40

Innings yet to start

Figure 3.10: Interface for Live score viewing

Figure 3.11 illustrates the user interface design for the fantasy leaderboard, showcasing rankings of participants based on their fantasy team performance, along with points and team details for competitive tracking**.**



Fantasy Leaderboard
1 Teams

#1 JG
11 Players
★ 71 pts

Sam Curran	Shreyas Iyer	Liam Livingstone
38 pts	20 pts	13 pts

Figure 3.11: Interface for Fantasy leaderboard

Figure 3.12 illustrates the user interface design for viewing fantasy team stats, providing detailed insights into team performance, including player points, captain and vice-captain contributions, and overall rankings.

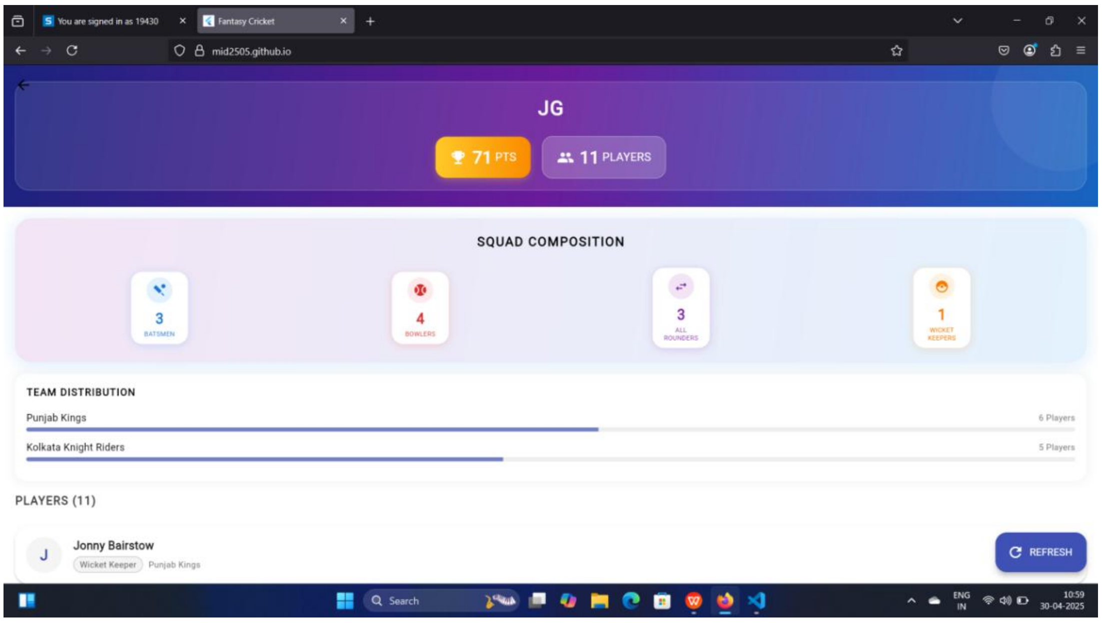


Figure 3.12: Interface for viewing fantasy team stats

Figure 3.13 illustrates the user interface design for creating or scheduling a match, allowing users to input match details such as teams, date, time, venue, and other relevant configurations.

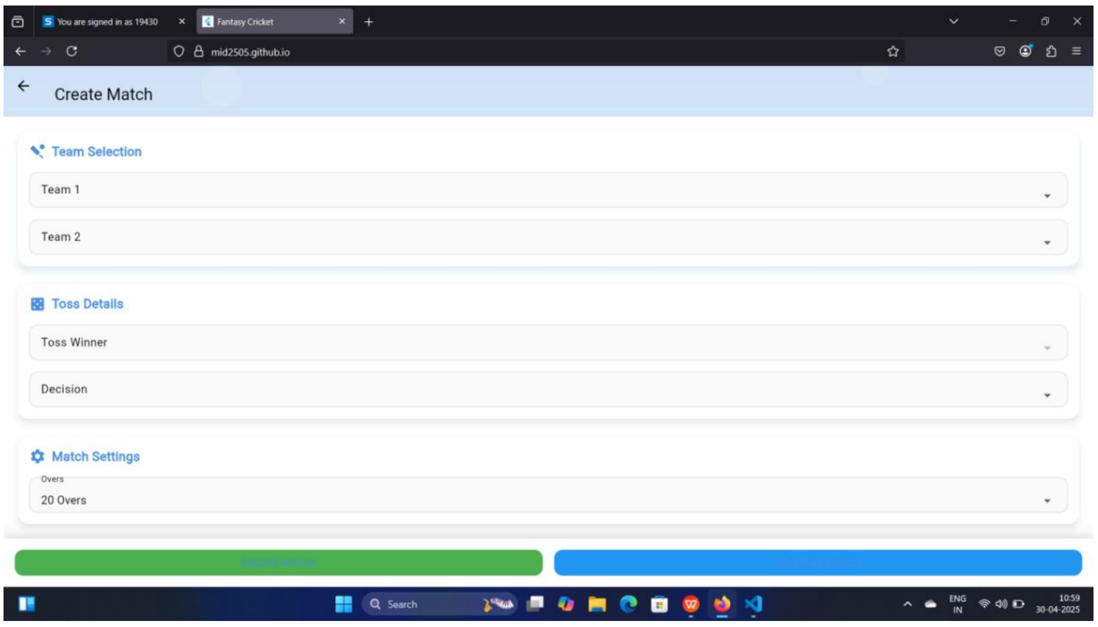
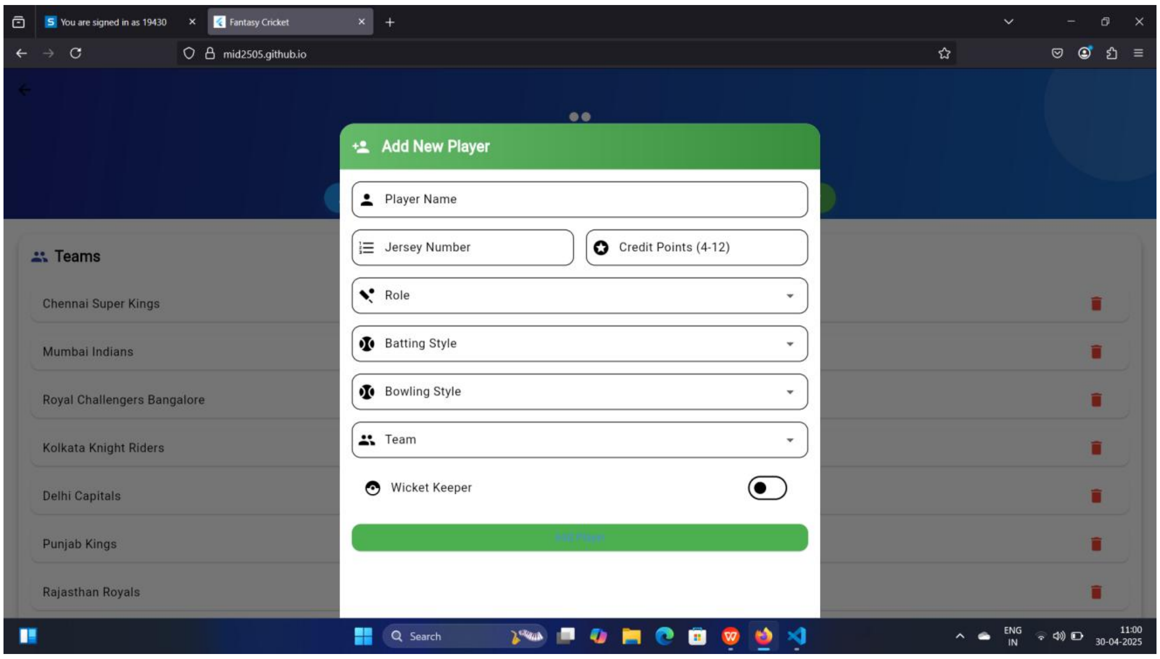


Figure 3.13: Interface for Creating/Scheduling match

Figure 3.14 illustrates the user interface design for team and players management, allowing users to add, edit, or remove players and manage team configurations with ease.


You are signed in as 19430
Fantasy Cricket
mid2505.github.io

Add New Player

Player Name

Jersey Number

Credit Points (4-12)

Role

Batting Style

Bowling Style

Team

Wicket Keeper

Teams

Chennai Super Kings

Mumbai Indians

Royal Challengers Bangalore

Kolkata Knight Riders

Delhi Capitals

Punjab Kings

Rajasthan Royals

Figure 3.14: Interface for Team/Players management

CHAPTER 4
SYSTEM IMPLEMENTATION

4.1 LOGIN IMPLEMENTATION

The login system uses Supabase authentication with email verification.

```
GET email, password from form
IF validation passes
   CHECK Supabase authentication
   IF user verified
      NAVIGATE to HomePage
   ELSE
      SHOW verification dialog
```

4.2 MATCH CREATION IMPLEMENTATION

Match officials can create new cricket matches with team details.

```
GET match details:
   Team1, Team2 selection
   Match date and venue
   Overs limit
   Fantasy deadline
IF all fields valid
   CREATE match in database
   ENABLE fantasy team creation
   SET match status as 'scheduled'
```

4.3 MATCH SCORING IMPLEMENTATION

The ball-by-ball scoring system handles various cricket scenarios.

```
GET current innings state
FOR each ball
  GET delivery type
  IF normal delivery
    GET runs scored (0-6)
    UPDATE batting statistics:
      Batsman runs
      Strike rate
      Boundaries count
    UPDATE bowling figures:
      Balls bowled
      Runs conceded
      Economy rate
    IF extras
    GET extra type:
      Wide: +1 run
      No ball: +1 run
      Byes/Leg byes: input runs
    ADD to extras total
    UPDATE team score
    IF wicket falls
        GET dismissal type:
            Bowled
            Caught
            LBW
            Run out
            Stumped
        UPDATE batting card
        UPDATE bowling figures
        GET new batsman
UPDATE match state:
    Current score
    Wickets fallen
    Overs completed
    Required rate
```

4.4 BATTING STATISTICS IMPLEMENTATION

Real-time tracking of batting performance metrics.

```
FOR each batsman
    INITIALIZE stats:
        Runs = 0
        Balls = 0
        Fours = 0
        Sixes = 0
```

```
  Dot balls = 0
 ON each ball faced
  IF runs scored
    ADD to total runs
    IF four runs
      INCREMENT fours
    IF six runs
      INCREMENT sixes
  ELSE
    INCREMENT dot balls

  INCREMENT balls faced
  CALCULATE:
    Strike rate = (runs/balls)*100
    Control % = ((balls-misses)/balls)*100
    Boundary % = ((fours+sixes)/balls)*100

ON dismissal
  RECORD:
    Final score
    Time batted
    Dismissal type
    Bowler name
```

4.5 FANTASY POINTS IMPLEMENTATION

Real-time fantasy points calculation.

```
FOR each player action
   IF batting
      CALCULATE points:
         Runs * 1
         Boundaries bonus
         Strike rate bonus
   IF bowling
      CALCULATE points:
         Wickets * 25
         Maiden over * 8
         Economy bonus
   UPDATE player total
   UPDATE team rankings
```

4.6 STATISTICS IMPLEMENTATION

Player statistics tracking system.

```
FOR each innings
   TRACK batting stats:
      Runs, balls, SR
      4s, 6s count
   TRACK bowling stats:
      Overs, maidens
      Wickets, economy
   UPDATE match summary
   GENERATE player rankings
```

4.7 MATCH STATE IMPLEMENTATION

Match progress tracking system.

```
INITIALIZE match state
WHILE match in progress
   UPDATE current innings
   TRACK over progress
   CHECK innings completion
   VALIDATE match rules
   UPDATE required rate
IF match complete
   DECLARE winner
   FINALIZE statistics
```

4.8 FANTASY TEAM IMPLEMENTATION

Fantasy team creation and validation.

```
GET user selection
VALIDATE team composition:
   11 players total
   1-4 wicketkeepers
   3-6 batsmen
```

```
    3-6 bowlers
    1-4 all-rounders
CHECK credit limit (100)
ASSIGN captain (2x)
ASSIGN vice-captain (1.5x)
```

4.9 LEADERBOARD IMPLEMENTATION

Real-time fantasy rankings system.

```
FOR each fantasy team
    CALCULATE total points
    SORT by points DESC
    ASSIGN ranks
    UPDATE leaderboard
DISPLAY top performers
SHOW point breakdowns
```

4.10 MATCH SUMMARY IMPLEMENTATION

Match statistics compilation.

```
GET match details
COMPILE statistics:
    Team scores
    Player performances
    Fantasy points
GENERATE match report
UPDATE match status
```

CHAPTER 5

RESULTS AND DISCUSSION

5.1 TEST CASES AND RESULTS

5.1.1 Score Recording Test Cases

Table 5.1 outlines the test case for validating the recording of a valid ball delivery in cricket scoring, ensuring that runs are added correctly and player statistics are updated accurately.

Table 5.1: Valid Ball Recording Test Case

Test Case ID	TC1
Test Case Description	Test recording a valid delivery with runs
Test Data	Delivery type: Normal, Runs: 4, Batsman: Smith, Bowler: Johnson
Expected Output	Runs added, statistics updated
Result	PASS

Table 5.2 describes the test case for recording extras in cricket scoring, specifically validating the correct handling of wide balls with additional runs and ensuring accurate scoring updates.

Table 5.2: Extras Recording Test Case

Test Case ID	TC2
Test Case Description	Test recording wide ball with additional runs
Test Data	Delivery type: Wide, Extra runs: 2
Expected Output	3 runs added (1 wide + 2 runs), no ball counted
Result	PASS

5.1.2 Fantasy Team Creation Test Cases

Table 5.3 describes the test case for creating a fantasy team within the allowed credit limit, validating that the team is successfully created with correct roles distribution and total credits within 100.

Table 5.3: Valid Team Creation

Test Case ID	TC3
Test Case Description	Test creating team within credit limit
Test Data	11 players selected, Total credits: 98.5, Valid roles distribution
Expected Output	Team created successfully
Result	PASS

Table 5.4 outlines the test case for validating team composition in fantasy sports, ensuring an error is triggered when the selected roles do not meet the required distribution, such as missing a wicketkeeper.

Table 5.4: Invalid Team Composition

Test Case ID	TC4
Test Case Description	Test team with invalid role distribution
Test Data	7 batsmen, 4 bowlers, no wicketkeeper
Expected Output	Error: "Must select 1-4 wicketkeepers"
Result	PASS

5.1.3 Match Statistics Test Cases

Table 5.5 outlines the test case for validating the calculation of the required run rate in cricket scoring, ensuring accurate outputs based on current runs, target, and overs remaining.

Table 5.5: Required Rate Calculation

Test Case ID	TC6
Test Case Description	Test required run rate calculation
Test Data	Target: 180, Current: 120/2 in 15 overs
Expected Output	Required Rate: 12.00
Result	PASS

5.1.4 Real-time Match Progress Test Cases

Table 5.6 describes the test case for validating real-time score updates in live cricket scoring, ensuring the total score and individual batsman statistics are updated correctly after each ball.

Table 5.6: Live Score Update

Test Case ID	TC7
Test Case Description	Test real-time score update after each ball
Test Data	Current Score: 45/1, Ball: 4 runs, Extras: 0
Expected Output	Score updates to 49/1, Batsman stats increment
Result	PASS

Table 5.7 details the test case for validating over completion in cricket scoring, ensuring the over count updates correctly and a prompt is triggered for selecting a new bowler.

Table 5.7: Over Completion

Test Case ID	TC8
Test Case Description	Test over completion and bowler change
Test Data	Over: 5.6, Bowler: Johnson
Expected Output	Over becomes 6.0, Prompt for new bowler
Result	PASS

5.1.5 Fantasy Points Calculation Test Cases

Table 5.8 describes the test case for validating the calculation of fantasy points for a batsman scoring a century, ensuring the correct allocation of points for runs, boundaries, sixes, and bonus milestones.

Table 5.8: Batting Points

Test Case ID	TC9
Test Case Description	Test fantasy points for century
Test Data	Batsman score: 102(65), 8 fours, 5 sixes
Expected Output	Points: 102 + 16 + 25 + 8 = 151 points
Result	PASS

Table 5.9 describes the test case for validating the calculation of fantasy points for a bowler achieving a 5-wicket haul, ensuring correct allocation of points for wickets taken and economy rate.

Table 5.9: Bowling Points

Test Case ID	TC10
Test Case Description	Test fantasy points for 5-wicket haul
Test Data	Bowling: 4-0-25-5
Expected Output	Points: 125 (wickets) + 4 (economy) = 129 points
Result	PASS

5.1.6 Match State Test Cases

Table 5.10 describes the test case for validating the transition from the first to the second innings in cricket scoring, ensuring the second innings starts correctly with the target set accurately.

Table 5.10: Innings Break

Test Case ID	TC11
Test Case Description	Test innings transition handling
Test Data	First innings complete, Score: 185/8
Expected Output	Second innings initiated, Target set: 186
Result	PASS

Table 5.11 describes the test case for validating the handling of match completion in cricket scoring, ensuring the match ends correctly, the winner is declared, and all statistics are finalized.

Table 5.11: Match Completion

Test Case ID	TC12
Test Case Description	Test match end conditions
Test Data	Target: 186, Score: 187/4 in 18.3 overs
Expected Output	Match ended, Winner declared, Stats finalized
Result	PASS

5.1.7 Statistics Update Test Cases

Table 5.12 describes the test case for validating the calculation of a bowler's economy rate, ensuring the output is accurate based on the number of overs bowled and runs conceded.

Table 5.12: Economy Rate

Test Case ID	TC14
Test Case Description	Test bowler economy rate calculation
Test Data	Overs: 3.2, Runs: 24, Wickets: 2
Expected Output	Economy Rate: 7.20
Result	PASS

CHAPTER 6

CONCLUSION AND FUTURE ENHANCEMENT(S)

The Fantasy Cricket Scoring System is a comprehensive application designed to revolutionize cricket match management and fantasy sports experience. The system successfully implements real-time match scoring capabilities alongside fantasy team management features, providing an engaging platform for both match officials and cricket enthusiasts. The application's user-friendly interface, enhanced by smooth animations and intuitive controls, makes it accessible for scorers to record ball-by-ball action while fantasy players can simultaneously track their teams' performance. Future enhancements could include advanced statistical analytics, automated highlight generation, real-time player valuation adjustments, and integration with live cricket feeds, further enriching the cricket scoring and fantasy gaming experience.

APPENDIX – A

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS:

Processor	:	Any
RAM	:	500MB
HDD	:	2GB

SOFTWARE REQUIREMENTS:

Operating System	:	Any
DBMS	:	Supabase
IDE used	:	Visual Studio Code
Flutter SDK Version	:	3.29.2 and above

APPENDIX – B

SOURCE CODE

```
import 'package:flutter/material.dart';
import 'package:login/match_summary_page.dart';
import
'package:supabase_flutter/supabase_flutter.dart';

// Add these imports at the top of the file
import 'dialogs/wide_dialog.dart';
import 'dialogs/no_ball_dialog.dart';
import 'dialogs/wicket_dialog.dart';

// Add at the top of the file after imports
enum DismissalType { bowled, caught, lbw,
runOut, stumped, hitWicket }

class ScoreUpdatingPage extends StatefulWidget {
  final int matchId;
  final int team1Id;
  final int team2Id;
  final int battingTeamId;
  final int bowlingTeamId;
  final int maxOvers;
  final bool isFirstInnings;
  // Add these new parameters
  final int tossWinnerId;
  final String tossChoice;

  const ScoreUpdatingPage({
    Key? key,
    required this.matchId,
    required this.team1Id,
    required this.team2Id,
    required this.battingTeamId,
    required this.bowlingTeamId,
    required this.maxOvers,
    required this.isFirstInnings,
    required this.tossWinnerId, // Add this
    required this.tossChoice, // Add this
  }) : super(key: key);

  @override
  State<ScoreUpdatingPage>    createState()    =>
_ScoreUpdatingPageState();
}

class    _ScoreUpdatingPageState    extends
State<ScoreUpdatingPage> {
  // Add in _ScoreUpdatingPageState class, with
other state variables
  List<Map<String, dynamic>> _playerStats = [];

  void _showError(String message) {
    ScaffoldMessenger.of(context).showSnackBar(
      SnackBar(content: Text(message)),
    );
  }

  // Basic match state
  bool _isLoading = true;
  Map<String, dynamic>? _innings;
  int _totalRuns = 0;
  int _wickets = 0;
  int _currentOver = 0;
  int _currentBall = 0;
  int? _target;

  // Add at the top of the _ScoreUpdatingPageState
class

  // Players
  String? _striker;
  String? _nonStriker;
  String? _currentBowler;
  List<Map<String, dynamic>> _battingTeam = [];
  List<Map<String, dynamic>> _bowlingTeam = [];

  // Current over tracking
  List<String> _currentOverBalls = [];
  int _currentOverRuns = 0;
  Map<String, List<int>> _currentOverExtras = {
    'wide_runs': [],
    'noball_runs': [],
  };

  @override
  void initState() {
```

```
  super.initState();
  // Initialize without setting state directly
  _initialize();
}

// New method to handle initialization
Future<void> _initialize() async {
  if (!mounted) return;

  try {
    // First update match status
    await Supabase.instance.client
        .from('matches')
        .update({
          'status': 'in_progress',
          'updated_at':
DateTime.now().toIso8601String(),
        })
        .eq('id', widget.matchId)
        .execute();

    // Then initialize match
    await _initializeMatch();
  } catch (error) {
    if (mounted) {
      _showError('Failed to initialize: $error');
    }
  }
}

@override
void dispose() {
  // Save state before disposing
  _saveCurrentState().then((_) {
    // Only proceed if still mounted
    if (mounted) {
      super.dispose();
    }
  });
}

Future<void> _saveCurrentState() async {
  try {
    await Supabase.instance.client
        .from('matches')
        .update({
          'status': 'in_progress',
          'updated_at':
DateTime.now().toIso8601String(),
        })
        .eq('id', widget.matchId)
        .execute();
  } catch (error) {
    debugPrint('Error saving match state: $error');
  }
}

Future<void> _loadPlayers() async {
  try {
    // Load batting team players
    final battingTeamResponse = await
Supabase.instance.client
        .from('players')
        .select()
        .eq('team_id', widget.battingTeamId)
        .execute();

    // Load bowling team players
    final bowlingTeamResponse = await
Supabase.instance.client
        .from('players')
        .select()
        .eq('team_id', widget.bowlingTeamId)
        .execute();

    setState(() {
      _battingTeam =
          List<Map<String,
dynamic>>.from(battingTeamResponse.data ?? []);
      _bowlingTeam =
          List<Map<String,
dynamic>>.from(bowlingTeamResponse.data ??
[]);
    });
  } catch (error) {
    _showError('Failed to load players: $error');
  }
}

Future<void> _initializeMatch() async {
  try {
    // 1. Load teams and players
    await _loadPlayers();

    // 2. Initialize or load innings
    await _initializeInnings();

    // 3. Initialize player stats
    await _initializePlayerStats();

    // 4. Show player selection dialog
    if (_striker == null) {
      await _showPlayerSelectionDialog();
    }

    setState(() => _isLoading = false);
  } catch (error) {
    _showError('Failed to initialize match: $error');
  }
 }

 Future<void> _initializeInnings() async {
  try {
    final response = await Supabase.instance.client
        .from('match_innings')
        .select()
        .eq('match_id', widget.matchId)
        .eq('innings_number', widget.isFirstInnings ?
1 : 2)
        .single()
        .execute();

    setState(() {
      _innings = response.data;
      _totalRuns = response.data['total_runs'] ?? 0;
      _wickets = response.data['wickets'] ?? 0;
      _currentOver                              =
response.data['current_over'] ?? 0;
      _currentBall = response.data['current_ball'] ??
0;
      _target   =   widget.isFirstInnings   ?   null   :
response.data['target'];
    });

    if (!widget.isFirstInnings) {
      // Show target dialog for second innings
      if (mounted) {
        await showDialog(
          context: context,
          barrierDismissible: false,
          builder: (context) => AlertDialog(
            title: const Text('Second Innings'),
            content: Column(
              mainAxisSize: MainAxisSize.min,
              children: [

Text('${_getTeamName(widget.battingTeamId)}
needs'),
                Text(
                  '${_target} runs to win',
                  style: const TextStyle(
                    fontSize: 24,
                    fontWeight: FontWeight.bold,
                  ),
                ),
                Text('from ${widget.maxOvers} overs'),
              ],
            ),
            actions: [
              ElevatedButton(
                onPressed: () {
                  Navigator.pop(context);
                  _showPlayerSelectionDialog();
                },
                child: const Text('Start Batting'),
              ),
            ],
          ),
        );
      }
    } else {
      await _showPlayerSelectionDialog();
    }
  } catch (error) {
    _showError('Failed    to    initialize    innings:
$error');
    print('Error details: $error');
  }
 }

 Future<void> _initializePlayerStats() async {
  try {
    final response = await Supabase.instance.client
        .from('match_player_stats')
        .select()
        .eq('match_id', widget.matchId)
        .eq('innings_number', widget.isFirstInnings ?
1 : 2)
        .execute();

    setState(() {
      _playerStats = List<Map<String,
dynamic>>.from(response.data ?? []);

      // Set current batsmen if they exist
      final batsmen =
        _playerStats.where((p) => p['is_batting']
== true).toList();
      if (batsmen.length >= 2) {
        _striker = batsmen[0]['player_id'].toString();
        _nonStriker =
batsmen[1]['player_id'].toString();
      }

      // Set current bowler if exists
      final bowler = _playerStats.firstWhere(
        (p) => p['is_bowling'] == true,
        orElse: () => {},
      );
      if (bowler.isNotEmpty) {
        _currentBowler =
bowler['player_id'].toString();
      }
    });
  } catch (error) {
    _showError('Failed to initialize player stats:
$error');
  }
 }

 Future<void> _showPlayerSelectionDialog()
async {
  if (_striker != null || _nonStriker != null ||
_currentBowler != null) {
    // Players already selected, skip selection
    return;
  }

  try {
    // Show striker selection
    final striker = await showDialog<String>(
      context: context,
      barrierDismissible: false,
      builder: (context) => AlertDialog(
        title: const Text('Select Striker'),
        content: SingleChildScrollView(
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: _battingTeam
                .where((p) => !_playerStats.any((s) =>
                    s['player_id'].toString() ==
p['id'].toString() &&
                    s['innings_number'] ==
(widget.isFirstInnings ? 1 : 2)))
                .map((player) => ListTile(
                      title: Text(player['name']),
                      onTap: () =>
                          Navigator.pop(context,
player['id'].toString()),
                    ))
                .toList(),
          ),
        ),
      ),
    );

    if (striker == null) return;

    // Show non-striker selection
    final nonStriker = await showDialog<String>(
      context: context,
      barrierDismissible: false,
      builder: (context) => AlertDialog(
        title: const Text('Select Non-Striker'),
        content: SingleChildScrollView(
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: _battingTeam
                .where((p) =>
                    p['id'].toString() != striker &&
                    !_playerStats.any((s) =>
                        s['player_id'].toString() ==
p['id'].toString() &&
                        s['innings_number'] ==
                            (widget.isFirstInnings ? 1 : 2)))
                .map((player) => ListTile(
                title: Text(player['name']),
                onTap: () =>
                  Navigator.pop(context,
player['id'].toString()),
              ))
            .toList(),
        ),
      ),
    ),
  );

  if (nonStriker == null) return;

  // Check if stats already exist for these players
  final strikerStats = await
_checkExistingStats(striker);
  final nonStrikerStats = await
_checkExistingStats(nonStriker);

  // Initialize or update striker stats
  if (!strikerStats) {
    await
Supabase.instance.client.from('match_player_stats')
.insert({
      'match_id': widget.matchId,
      'innings_number': widget.isFirstInnings ? 1 :
2,
      'player_id': striker,
      'team_id': widget.battingTeamId,
      'is_batting': true,
      'is_on_strike': true,
      'has_batted': true,
      'runs_scored': 0,
      'balls_faced': 0,
      'fours': 0,
      'sixes': 0,
    }).execute();
  }

  // Initialize or update non-striker stats
  if (!nonStrikerStats) {
    await
Supabase.instance.client.from('match_player_stats')
.insert({
      'match_id': widget.matchId,
      'innings_number': widget.isFirstInnings ? 1 :
2,
      'player_id': nonStriker,
      'team_id': widget.battingTeamId,
      'is_batting': true,
      'is_on_strike': false,
      'has_batted': true,
      'runs_scored': 0,
      'balls_faced': 0,
      'fours': 0,
      'sixes': 0,
    }).execute();
  }

  setState(() {
    _striker = striker;
    _nonStriker = nonStriker;
  });

  // Now show bowler selection
  await _showBowlerSelectionDialog();
 } catch (error) {
  _showError('Failed to select players: $error');
  print('Error details: $error');
 }
}

// Add this helper method to check for existing
stats
Future<bool> _checkExistingStats(String
playerId) async {
  final response = await Supabase.instance.client
    .from('match_player_stats')
    .select()
    .eq('match_id', widget.matchId)
    .eq('innings_number', widget.isFirstInnings ?
1 : 2)
    .eq('player_id', playerId)
    .maybeSingle()
    .execute();

  return response.data != null;
}

Future<void> _showBowlerSelectionDialog()
async {
  try {
    final bowler = await showDialog<String>(
      context: context,
      barrierDismissible: false,
      builder: (context) => AlertDialog(
        title: const Text('Select Bowler'),
        content: Column(
          mainAxisSize: MainAxisSize.min,
          children: _bowlingTeam
              .map((player) => ListTile(
                    title: Text(player['name']),
                    onTap: () =>
                        Navigator.pop(context,
player['id'].toString()),
                  ))
              .toList(),
        ),
      ),
    );

    if (bowler == null) return;

    // Initialize stats for selected bowler
    await _initializeBowler(bowler);

    setState(() {
      _currentBowler = bowler;
    });
  } catch (error) {
    _showError('Failed to select bowler: $error');
  }
 }

 Future<void> _initializeBowler(String playerId)
async {
  await
Supabase.instance.client.from('match_player_stats')
.insert({
    'match_id': widget.matchId,
    'player_id': playerId,
    'team_id': widget.bowlingTeamId,
    'innings_number': widget.isFirstInnings ? 1 : 2,
    'is_bowling': true,
    'has_bowled': true,
  }).execute();
 }

 String _getBatsmanName(String playerId) {
  final player = _battingTeam.firstWhere(
    (p) => p['id'].toString() == playerId,
    orElse: () => {'name': 'Unknown'},
  );
  return player['name'] ?? 'Unknown';
 }

 String _getBowlerName(String playerId) {
  final player = _bowlingTeam.firstWhere(
    (p) => p['id'].toString() == playerId,
    orElse: () => {'name': 'Unknown'},
  );
  return player['name'] ?? 'Unknown';
 }

 String _getBatsmanScore(String playerId) {
  final stats = _playerStats.firstWhere(
    (s) => s['player_id'].toString() == playerId,
    orElse: () => {},
  );
  return '${stats['runs_scored'] ??
0}(${stats['balls_faced'] ?? 0})';
 }

 String _getBowlerFigures(String playerId) {
  final stats = _playerStats.firstWhere(
    (s) => s['player_id'].toString() == playerId,
    orElse: () => {},
  );
  final overs = (stats['balls_bowled'] ?? 0) ~/ 6;
  final balls = (stats['balls_bowled'] ?? 0) % 6;
  return '${stats['wickets'] ?? 0}-
${stats['runs_conceded'] ?? 0} ($overs.$balls)';
 }

 String _getTeamName(int teamId) {
  if (teamId == widget.team1Id) {
    return 'Team 1'; // Replace with actual team
names from database
  } else if (teamId == widget.team2Id) {
    return 'Team 2';
  }
  return 'Unknown Team';
 }
```

```
Color _getRunButtonColor(int runs) {
  switch (runs) {
    case 0:
      return Colors.grey;
    case 4:
      return Colors.green;
    case 6:
      return Colors.blue;
    default:
      return Colors.blue.shade700;
  }
}

@override
Widget build(BuildContext context) {
  if (_isLoading) {
    return const Scaffold(
      body:                                Center(child:
CircularProgressIndicator()),
    );
  }

  return Scaffold(
    appBar: AppBar(
      title: Text('Live Score'),
      actions: [
        IconButton(
          icon: Icon(Icons.refresh),
          onPressed: _refreshStats,
        ),
      ],
    ),
    body: Column(
      children: [
        _buildScoreCard(),
        _buildCurrentOver(),
        Expanded(
          child: DefaultTabController(
            length: 2,
            child: Column(
              children: [
                TabBar(
                  tabs: [
                    Tab(text: 'Batting'),
                    Tab(text: 'Bowling'),
                  ],
                ),
                Expanded(
                  child: TabBarView(
                    children: [
                      _buildBattingStats(),
                      _buildBowlingStats(),
                    ],
                  ),
                ),
              ],
            ),
          ),
        ),
        _buildScoringPanel(),
      ],
    ),
  );
}

Widget _buildScoreCard() {
  return Card(
    child: Padding(
      padding: const EdgeInsets.all(16.0),
      child: Column(
        children: [
          Text(
            '${_getTeamName(widget.battingTeamId)}
vs ${_getTeamName(widget.bowlingTeamId)}',
            style:    const    TextStyle(fontSize:    18,
fontWeight: FontWeight.bold),
          ),
          const SizedBox(height: 8),
          Text(
            '$_totalRuns/$_wickets',
            style:    const    TextStyle(fontSize:    24,
fontWeight: FontWeight.bold),
          ),
          Text('Overs:
$_currentOver.${_currentBall}'),
          if  (!widget.isFirstInnings  &&  _target  !=
null) ...[
            const SizedBox(height: 8),
            Text(
              'Target: $_target',
          style: const TextStyle(fontWeight:
FontWeight.bold),
          ),
          Text(
           'Need ${_target! - _totalRuns} from
${(widget.maxOvers * 6) - (_currentOver * 6 +
_currentBall)} balls',
          ),
         ],
        ],
      ),
     ),
    );
  }

  Widget _buildCurrentOver() {
    return Container(
      padding: const EdgeInsets.all(8),
      color: Colors.grey.shade200,
      child: Column(
        crossAxisAlignment:
CrossAxisAlignment.start,
        children: [
          const Text('This Over:'),
          _buildThisOverDetails(),
        ],
      ),
    );
  }

  Widget _buildThisOverDetails() {
    return Container(
      padding: const EdgeInsets.all(8),
      decoration: BoxDecoration(
        color: Colors.grey.shade100,
        borderRadius: BorderRadius.circular(8),
      ),
      child: Row(
        mainAxisSize: MainAxisSize.min,
        children:
_currentOverBalls.asMap().entries.map((entry) {
          Color ballColor;
          String displayText = entry.value;
          final index = entry.key;

          // Handle different ball types
          switch (entry.value) {
            case 'Nb':
              // Extract runs from no ball if any
              final nbRuns =

(_currentOverExtras['noball_runs']?.length ?? 0) >
index
                  ?
_currentOverExtras['noball_runs']![index]
                  : 1;
              displayText = nbRuns > 1 ?
'Nb+${nbRuns - 1}' : 'Nb';
              ballColor = Colors.purple;
              break;
            case 'Wd':
              // Extract runs from wide if any
              final wideRuns =

(_currentOverExtras['wide_runs']?.length ?? 0) >
index
                  ?
_currentOverExtras['wide_runs']![index]
                  : 1;
              displayText = wideRuns > 1 ?
'Wd+${wideRuns - 1}' : 'Wd';
              ballColor = Colors.orange;
              break;
            case 'W':
              ballColor = Colors.red;
              break;
            case '4':
              ballColor = Colors.green;
              break;
            case '6':
              ballColor = Colors.blue;
              break;
            default:
              ballColor = Colors.black87;
          }

          return Container(
            margin: const
EdgeInsets.symmetric(horizontal: 4),
            padding: const EdgeInsets.all(8),
            decoration: BoxDecoration(
              color: Colors.white,
              border: Border.all(color: ballColor),
              borderRadius: BorderRadius.circular(4),
            ),
            child: Text(
              displayText,
              style:     TextStyle(color:     ballColor,
fontWeight: FontWeight.bold),
            ),
          );
        }).toList(),
      ),
    );
  }

  Widget _buildBattingStats() {
    return SingleChildScrollView(
      child: DataTable(
        columns: const [
          DataColumn(label: Text('Batter')),
          DataColumn(label: Text('R')),
          DataColumn(label: Text('B')),
          DataColumn(label: Text('4s')),
          DataColumn(label: Text('6s')),
          DataColumn(label: Text('SR')),
          DataColumn(label: Text('Dismissal')), // Add
this column
        ],
        rows: _playerStats
            .where((p) =>
                p['team_id']   ==   widget.battingTeamId
&&
                (p['is_batting']  ==  true  ||  p['has_batted']
== true))
            .map((stats) {
          final player = _battingTeam.firstWhere(
            (p)        =>        p['id'].toString()        ==
stats['player_id'].toString(),
            orElse: () => {'name': 'Unknown'},
          );

          final strikeRate = stats['balls_faced'] > 0
              ? ((stats['runs_scored'] ?? 0) *
                      100.0 /
                      (stats['balls_faced'] ?? 1))
                  .toStringAsFixed(1)
              : '0.0';

          // Add dismissal info
          String dismissalInfo = '';
          if (stats['is_out'] == true) {
            dismissalInfo                              =
stats['dismissal_type']?.toUpperCase() ?? '';
            if (stats['dismissed_by_bowler_id'] != null)
{
              final bowler = _bowlingTeam.firstWhere(
                (p) =>
                    p['id'].toString() ==

stats['dismissed_by_bowler_id'].toString(),
                orElse: () => {'name': 'Unknown'},
              );
              dismissalInfo += ' b ${bowler['name']}';
            }
            if (stats['dismissed_by_fielder_id'] != null)
{
              final fielder = _bowlingTeam.firstWhere(
                (p) =>
                    p['id'].toString() ==

stats['dismissed_by_fielder_id'].toString(),
                orElse: () => {'name': 'Unknown'},
              );
              dismissalInfo += ' c ${fielder['name']}';
            }
          }

          return DataRow(
            selected:    stats['player_id'].toString()    ==
_striker ||
                stats['player_id'].toString()            ==
_nonStriker,
            cells: [
              DataCell(Text(player['name']              ??
'Unknown')),
              DataCell(Text('${stats['runs_scored']     ??
0}')),
              DataCell(Text('${stats['balls_faced']      ??
0}')),
              DataCell(Text('${stats['fours'] ?? 0}')),
              DataCell(Text('${stats['sixes'] ?? 0}')),
              DataCell(Text(strikeRate)),
          DataCell(Text(dismissalInfo)), // Add this
cell
        ],
      );
    }).toList(),
  ),
 );
}

Widget _buildBowlingStats() {
  return SingleChildScrollView(
    child: DataTable(
      columns: const [
        DataColumn(label: Text('Bowler')),
        DataColumn(label: Text('O')),
        DataColumn(label: Text('M')),
        DataColumn(label: Text('R')),
        DataColumn(label: Text('W')),
        DataColumn(label: Text('Eco')),
      ],
      rows: _playerStats
          .where((p) =>
            p['team_id'] == widget.bowlingTeamId
&&
            (p['is_bowling'] == true || p['has_bowled']
== true))
          .map((stats) {
        final player = _bowlingTeam.firstWhere(
          (p) => p['id'].toString() ==
stats['player_id'].toString(),
          orElse: () => {'name': 'Unknown'},
        );

        final overs = (stats['balls_bowled'] ?? 0) ~/ 6;
        final balls = (stats['balls_bowled'] ?? 0) % 6;
        final economy = overs > 0
            ? ((stats['runs_conceded'] ?? 0) /
overs).toStringAsFixed(1)
            : '0.0';

        return DataRow(
          selected: stats['player_id'].toString() ==
_currentBowler,
          cells: [
            DataCell(Text(player['name'] ??
'Unknown')),
            DataCell(Text('$overs.$balls')),
            DataCell(Text('${stats['maidens'] ?? 0}')),
            DataCell(Text('${stats['runs_conceded'] ??
0}')),
            DataCell(Text('${stats['wickets'] ?? 0}')),
            DataCell(Text(economy)),
          ],
        );
      }).toList(),
    ),
  );
}

Widget _buildScoringPanel() {
  return Container(
    padding: const EdgeInsets.all(16),
    decoration: BoxDecoration(
      gradient: LinearGradient(
        colors: [Colors.black87,
Colors.blue.shade900],
        begin: Alignment.topLeft,
        end: Alignment.bottomRight,
      ),
      borderRadius: BorderRadius.circular(16),
      boxShadow: [
        BoxShadow(
          color: Colors.blue.withOpacity(0.3),
          blurRadius: 8,
          spreadRadius: 2,
        ),
      ],
    ),
    child: Column(
      children: [
        // Runs buttons
        Row(
          mainAxisAlignment:
MainAxisAlignment.spaceEvenly,
          children: [0, 1, 2, 3, 4, 5, 6].map((runs) {
            return Container(
              decoration: BoxDecoration(
                shape: BoxShape.circle,
                gradient: LinearGradient(
                  colors: [
                    _getRunButtonColor(runs),
_getRunButtonColor(runs).withOpacity(0.7),
          ],
          begin: Alignment.topLeft,
          end: Alignment.bottomRight,
         ),
         boxShadow: [
          BoxShadow(
           color:
_getRunButtonColor(runs).withOpacity(0.5),
           blurRadius: 4,
           spreadRadius: 1,
          ),
         ],
        ),
        child: ElevatedButton(
         onPressed:          ()          =>
_handleRunScored(runs),
         style: ElevatedButton.styleFrom(
          backgroundColor: Colors.transparent,
          foregroundColor: Colors.white,
          shadowColor: Colors.transparent,
          minimumSize: const Size(50, 50),
          shape: const CircleBorder(),
         ),
         child: Text(
          '$runs',
          style: const TextStyle(
           fontSize: 20,
           fontWeight: FontWeight.bold,
          ),
         ),
        ),
       );
      }).toList(),
     ),
     const SizedBox(height: 16),
     // Extras buttons
     Row(
      mainAxisAlignment:
MainAxisAlignment.spaceEvenly,
      children: [
       _buildExtraButton('Wide', Colors.orange),
       _buildExtraButton('No Ball', Colors.red),
       _buildExtraButton('Bye', Colors.teal),
       _buildExtraButton('Leg              Bye',
Colors.indigo),
       _buildExtraButton(
         'Penalty',   Colors.purple),   //   Added
penalty button
      ],
     ),
     const SizedBox(height: 16),
     // Wicket button
     Container(
      width: double.infinity,
      height: 50,
      decoration: BoxDecoration(
       gradient: LinearGradient(
        colors:              [Colors.red.shade900,
Colors.red.shade700],
        begin: Alignment.topLeft,
        end: Alignment.bottomRight,
       ),
       borderRadius: BorderRadius.circular(25),
       boxShadow: [
        BoxShadow(
         color: Colors.red.withOpacity(0.3),
         blurRadius: 8,
         spreadRadius: 2,
        ),
       ],
      ),
      child: ElevatedButton.icon(
       onPressed: () => _handleWicket(),
       icon: const Icon(Icons.sports_cricket, size:
28),
       label: const Text(
        'WICKET',
        style: TextStyle(fontSize: 18, fontWeight:
FontWeight.bold),
       ),
       style: ElevatedButton.styleFrom(
        backgroundColor: Colors.transparent,
        foregroundColor: Colors.white,
        shadowColor: Colors.transparent,
        shape: RoundedRectangleBorder(
         borderRadius:
BorderRadius.circular(25),
        ),
       ),
          ),
        ),
      ],
    ),
  );
}

Widget _buildExtraButton(String label, Color
color) {
  return Container(
    decoration: BoxDecoration(
      gradient: LinearGradient(
        colors: [color, color.withOpacity(0.7)],
        begin: Alignment.topLeft,
        end: Alignment.bottomRight,
      ),
      borderRadius: BorderRadius.circular(12),
      boxShadow: [
        BoxShadow(
          color: color.withOpacity(0.3),
          blurRadius: 4,
          spreadRadius: 1,
        ),
      ],
    ),
    child: ElevatedButton(
      onPressed: () {
        switch (label) {
          case 'Wide':
            _handleWide();
            break;
          case 'No Ball':
            _handleNoBall();
            break;
          case 'Bye':
            _handleBye();
            break;
          case 'Leg Bye':
            _handleLegBye();
            break;
          case 'Penalty':
            _handlePenalty();
            break;
        }
      },
      style: ElevatedButton.styleFrom(
        backgroundColor: Colors.transparent,
        foregroundColor: Colors.white,
        shadowColor: Colors.transparent,
        padding: const
EdgeInsets.symmetric(horizontal: 12, vertical: 12),
        shape: RoundedRectangleBorder(
          borderRadius: BorderRadius.circular(12),
        ),
      ),
      child: Text(
        label,
        style: const TextStyle(
          fontSize: 14,
          fontWeight: FontWeight.bold,
        ),
      ),
    ),
  );
}

Future<void> _updateStats({
  required int runsScored,
  required bool isExtra,
  required String extraType,
  required bool countAsBall,
  bool updateWides = false,
  bool updateNoBalls = false,
  int batsmanRuns = 0,
  bool penaltyToBowlingTeam = false,
  bool countBatsmanBall = false,
}) async {
  try {
    // Update total runs before checking target
    final newTotalRuns = _totalRuns + runsScored;

    // Check if this will exceed target in second
innings
    if (!widget.isFirstInnings &&
        _target != null &&
        newTotalRuns >= _target!) {
      // Update stats first
      await _updateMatchAndPlayerStats(
        runsScored,
        isExtra,
        extraType,
        countAsBall,
        updateWides,
        updateNoBalls,
        batsmanRuns,
        penaltyToBowlingTeam,
        countBatsmanBall);

      // End innings immediately
      await _endInnings();
      return;
    }

    // Continue with normal stats update if target
not reached
    await _updateMatchAndPlayerStats(
      runsScored,
      isExtra,
      extraType,
      countAsBall,
      updateWides,
      updateNoBalls,
      batsmanRuns,
      penaltyToBowlingTeam,
      countBatsmanBall);

    // Check other innings completion conditions
    if (_shouldEndInnings()) {
      await _endInnings();
    } else if (_currentBall >= 6) {
      await _handleOverComplete();
    }
  } catch (error) {
    _showError('Failed to update stats: $error');
    print('Error details: $error');
  }
 }

 Future<void> _updateMatchAndPlayerStats(
    int runsScored,
    bool isExtra,
    String extraType,
    bool countAsBall,
    bool updateWides,
    bool updateNoBalls,
    int batsmanRuns,
    bool penaltyToBowlingTeam,
    bool countBatsmanBall) async {
  try {
    // 1. Update match innings
    await Supabase.instance.client
      .from('match_innings')
      .update({
        'total_runs': _totalRuns + runsScored,
        'current_over': _currentOver,
        'current_ball': countAsBall ? _currentBall +
1 : _currentBall,
      })
      .eq('match_id', widget.matchId)
      .eq('innings_number', widget.isFirstInnings ?
1 : 2)
      .execute();

    // Replace the batsman stats section in
_updateStats
    if (!isExtra || batsmanRuns > 0 ||
countBatsmanBall) {
      final batsmanStats = await
Supabase.instance.client
        .from('match_player_stats')
        .select()
        .eq('match_id', widget.matchId)
        .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
        .eq('player_id', _striker)
        .single()
        .execute();

      await Supabase.instance.client
        .from('match_player_stats')
        .update({
          'runs_scored':
(batsmanStats.data['runs_scored'] ?? 0) +
            (isExtra ? batsmanRuns : runsScored),
          'balls_faced':
(batsmanStats.data['balls_faced'] ?? 0) +
            ((countAsBall || countBatsmanBall) ? 1 :
0),
          'fours': (batsmanStats.data['fours'] ?? 0) +
            ((batsmanRuns == 4 || (!isExtra &&
runsScored == 4)) ? 1 : 0),
          'sixes': (batsmanStats.data['sixes'] ?? 0) +
            ((batsmanRuns == 6 || (!isExtra &&
runsScored == 6)) ? 1 : 0),
            'dots_faced':
(batsmanStats.data['dots_faced'] ?? 0) +
              ((batsmanRuns == 0 && countAsBall) ?
1 : 0),
          })
          .eq('match_id', widget.matchId)
          .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
          .eq('player_id', _striker)
          .execute();
    }

    // 3. Rest of the method (bowler stats, state
updates, etc.) remains the same...
    if (_striker == null || _currentBowler == null)
return;

    try {
      // Get current stats first
      final bowlerStats = await
Supabase.instance.client
          .from('match_player_stats')
          .select()
          .eq('match_id', widget.matchId)
          .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
          .eq('player_id', _currentBowler)
          .maybeSingle()
          .execute();

      // Update bowler stats
      if (!penaltyToBowlingTeam) {
        await Supabase.instance.client
            .from('match_player_stats')
            .update({
              'runs_conceded':
                (bowlerStats.data?['runs_conceded'] ??
0) + runsScored,
              'balls_bowled':
(bowlerStats.data?['balls_bowled'] ?? 0) +
                (countAsBall ? 1 : 0),
              'dots_bowled':
(bowlerStats.data?['dots_bowled'] ?? 0) +
                (runsScored == 0 && countAsBall ?
1 : 0),
              'wides':
                (bowlerStats.data?['wides'] ?? 0) +
(updateWides ? 1 : 0),
              'no_balls':
(bowlerStats.data?['no_balls'] ?? 0) +
                (updateNoBalls ? 1 : 0),
            })
            .eq('match_id', widget.matchId)
            .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
            .eq('player_id', _currentBowler)
            .execute();
      }

      // Update state
      setState(() {
        _totalRuns += runsScored;
        if (countAsBall) {
          _currentBall++;
          _currentOverBalls.add(
            isExtra ? extraType[0].toUpperCase() :
runsScored.toString());
        } else {
          _currentOverBalls.add(extraType ==
'wide' ? 'Wd' : 'Nb');
        }

        if (!isExtra && runsScored % 2 == 1) {
          final temp = _striker;
          _striker = _nonStriker;
          _nonStriker = temp;
        }
      });

      // Refresh stats
      await _refreshStats();

      // Check for over completion
      if (_currentBall >= 6) {
        await _handleOverComplete();
      } else if (_currentOver >= widget.maxOvers)
{
        // If somehow we reach max overs without
completing current over
        await _endInnings();
      }
```

```
        // Also check for innings completion conditions
        if (_shouldEndInnings()) {
          await _endInnings();
        }
      } catch (error) {
        _showError('Failed to update stats: $error');
        print('Error details: $error');
      }
    } catch (error) {
      _showError('Failed to update stats: $error');
      print('Error details: $error');
    }
  }

  bool _shouldEndInnings() {
    // Check if innings should end based on various conditions
    if (!widget.isFirstInnings && _target != null) {
      // Second innings conditions
      if (_target != null && _totalRuns >= _target!) {
        // Target achieved
        return true;
      }
      if (_wickets >= 10) {
        // All out
        return true;
      }
      if (_currentOver >= widget.maxOvers) {
        // Overs completed
        return true;
      }
    } else {
      // First innings conditions
      if (_wickets >= 10 || _currentOver >= widget.maxOvers) {
        return true;
      }
    }
    return false;
  }

  Future<void> _handleRunScored(int runs) async {
    if (_striker == null || _currentBowler == null) return;

    try {
      await _updateStats(
        runsScored: runs,
        isExtra: false,
        extraType: '',
        countAsBall: true,
      );
    } catch (error) {
      _showError('Failed to update score: $error');
    }
  }

  Future<void> _refreshStats() async {
    try {
      // Fetch updated match stats
      final matchStats = await Supabase.instance.client
          .from('match_innings')
          .select()
          .eq('match_id', widget.matchId)
          .eq('innings_number', widget.isFirstInnings ? 1 : 2)
          .single()
          .execute();

      // Fetch all player stats for this innings
      final playerStats = await Supabase.instance.client
          .from('match_player_stats') // Updated table name
          .select()
          .eq('match_id', widget.matchId)
          .eq('innings_number', widget.isFirstInnings ? 1 : 2)
          .execute();

      if (mounted) {
        setState(() {
          // Update match stats
          _innings = matchStats.data;
          _totalRuns = matchStats.data['total_runs'] ?? 0;
          _wickets = matchStats.data['wickets'] ?? 0;
          // Update player stats
          _playerStats =
            List<Map<String,
  dynamic>>.from(playerStats.data ?? []);
        });
      }
    } catch (error) {
      _showError('Failed to refresh stats: $error');
    }
  }

  Future<void> _handleWide() async {
    try {
      final result = await showDialog<Map<String,
  dynamic>>(
        context: context,
        builder:                (context)              =>
  WideDialog(allowedRuns: [0, 1, 2, 3, 4]),
      );

      if (result != null) {
        final additionalRuns = result['runs'] as int;
        final isWicket = result['isWicket'] as bool;

        await _updateStats(
          runsScored: 1 + additionalRuns,
          isExtra: true,
          extraType: 'wide',
          countAsBall: false,
          updateWides: true,
        );

        if (isWicket) {
          await      _handleWicket(allowedDismissals:
  [DismissalType.stumped]);
        }
      }
    } catch (error) {
      _showError('Failed to process wide: $error');
    }
  }

  Future<void> _handleNoBall() async {
    try {
      final result = await showDialog<Map<String,
  dynamic>>(
        context: context,
        builder:                (context)              =>
  NoBallDialog(allowedRuns: [0, 1, 2, 3, 4, 6]),
      );

      if (result != null) {
        final runsScored = result['runs'] as int;
        final isWicket = result['isWicket'] as bool;

        // Update extras tracking
        setState(() {

  _currentOverExtras['noball_runs']?.add(runsScore
  d + 1);
        });

        // Update stats with runs counting for batsman
        await _updateStats(
          runsScored: 1 + runsScored, // 1 for no ball
  + runs scored
          isExtra: true,
          extraType: 'noball',
          countAsBall: false, // Don't count in bowler's
  overs
          updateNoBalls: true,
          batsmanRuns: runsScored, // Credit runs to
  batsman
          countBatsmanBall: true, // Add this to count
  the ball for batsman
        );

        if (isWicket) {
          await _handleWicket(
            allowedDismissals: [DismissalType.runOut,
  DismissalType.hitWicket],
          );
        }
      }
    } catch (error) {
      _showError('Failed to process no ball: $error');
    }
  }

  Future<void> _handleWideWicket() async {
    // Only allow stumping on wide
    await           _handleWicket(allowedDismissals:
[DismissalType.stumped]);
  }

  Future<void> _handleNoBallWicket() async {
    // Only allow run out and hit wicket on no ball
    await _handleWicket(
      allowedDismissals:      [DismissalType.runOut,
DismissalType.hitWicket],
    );
  }

  Future<void> _handleBye() async {
    try {
      int? runs;
      await showDialog(
        context: context,
        builder: (context) => AlertDialog(
          title: const Text('Bye Runs'),
          content: Row(
            mainAxisSize: MainAxisSize.min,
            children: [1, 2, 3, 4].map((run) {
              return Padding(
                padding:                              const
EdgeInsets.symmetric(horizontal: 4),
                child: ElevatedButton(
                  onPressed: () {
                    runs = run;
                    Navigator.pop(context);
                  },
                  child: Text('$run'),
                ),
              );
            }).toList(),
          ),
        ),
      );

      if (runs != null) {
        await _updateStats(
          runsScored: runs!,
          isExtra: true,
          extraType: 'bye',
          countAsBall: true,
        );
      }
    } catch (error) {
      _showError('Failed to process bye: $error');
    }
  }

  Future<void> _handleLegBye() async {
    try {
      int? runs;
      await showDialog(
        context: context,
        builder: (context) => AlertDialog(
          title: const Text('Leg Bye Runs'),
          content: Row(
            mainAxisSize: MainAxisSize.min,
            children: [1, 2, 3, 4].map((run) {
              return Padding(
                padding:                              const
EdgeInsets.symmetric(horizontal: 4),
                child: ElevatedButton(
                  onPressed: () {
                    runs = run;
                    Navigator.pop(context);
                  },
                  child: Text('$run'),
                ),
              );
            }).toList(),
          ),
        ),
      );

      if (runs != null) {
        await _updateStats(
          runsScored: runs!,
          isExtra: true,
          extraType: 'legbye',
          countAsBall: true,
        );
      }
    } catch (error) {
      _showError('Failed to process leg bye: $error');
    }
  }

  Future<void> _handleOverComplete() async {
```

```
  try {
    // Check for maiden over
    final isMaiden = _currentOverBalls.every((ball)
=> ball == '0');

    // Get current bowler stats
    final          bowlerStats          =          await
Supabase.instance.client
        .from('match_player_stats')
        .select()
        .eq('match_id', widget.matchId)
        .eq('innings_number', widget.isFirstInnings ?
1 : 2)
        .eq('player_id', _currentBowler)
        .maybeSingle()
        .execute();

    if (bowlerStats.data != null) {
      // Update existing bowler stats
      await Supabase.instance.client
          .from('match_player_stats')
          .update({
            'is_bowling': false,
            'maidens': isMaiden
                ? (bowlerStats.data['maidens'] ?? 0) + 1
                : bowlerStats.data['maidens'] ?? 0,
            'balls_bowled':
                (bowlerStats.data['balls_bowled']  ??  0)
+ (6 - _currentBall),
            'overs_bowled': _currentOver + 1,
          })
          .eq('match_id', widget.matchId)
          .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
          .eq('player_id', _currentBowler)
          .execute();
    }

    // Show new bowler dialog
    final newBowler = await showDialog<String>(
      context: context,
      barrierDismissible: false,
      builder: (context) => AlertDialog(
        title: const Text('Select New Bowler'),
        content: SingleChildScrollView(
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: _bowlingTeam
                .where((player) =>
                    player['id'].toString()                 !=
_currentBowler &&
                    !_playerStats.any((stats) =>
                        stats['player_id'].toString() ==
                            player['id'].toString() &&
                        stats['is_bowling'] == true))
                .map((player) => ListTile(
                      title: Text(player['name']),
                      onTap: () =>
                          Navigator.pop(context,
player['id'].toString()),
                    ))
                .toList(),
          ),
        ),
      ),
    );

    if (newBowler != null) {
      // Initialize or update new bowler stats
      final         newBowlerStats         =         await
Supabase.instance.client
          .from('match_player_stats')
          .select()
          .eq('match_id', widget.matchId)
          .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
          .eq('player_id', newBowler)
          .maybeSingle()
          .execute();

      if (newBowlerStats.data != null) {
        await Supabase.instance.client
            .from('match_player_stats')
            .update({
              'is_bowling': true,
              'has_bowled': true,
            })
            .eq('match_id', widget.matchId)
            .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
            .eq('player_id', newBowler)
            .execute();
      } else {
        await
Supabase.instance.client.from('match_player_stats')
.insert({
          'match_id': widget.matchId,
          'innings_number': widget.isFirstInnings ? 1 :
2,
          'player_id': newBowler,
          'team_id': widget.bowlingTeamId,
          'is_bowling': true,
          'has_bowled': true,
          'balls_bowled': 0,
          'runs_conceded': 0,
          'maidens': 0,
          'wickets': 0,
          'overs_bowled': 0,
        }).execute();
      }

      setState(() {
        _currentBowler = newBowler;
        _currentOver++;
        _currentBall = 0;
        _currentOverRuns = 0;
        _currentOverBalls.clear();
        _currentOverExtras.clear();
      });
    }
  } catch (error) {
    _showError('Failed to complete over: $error');
    print('Error details: $error');
  }
 }

 Future<void> _handlePenalty() async {
  try {
    int? runs;
    String? team;

    await showDialog(
      context: context,
      builder: (context) => AlertDialog(
        title: const Text('Penalty Runs'),
        content: Column(
          mainAxisSize: MainAxisSize.min,
          children: [
            DropdownButtonFormField<String>(
              decoration:                    const
InputDecoration(labelText: 'Award to'),
              items: [
                DropdownMenuItem(
                  value: 'batting', child: Text('Batting
Team')),
                DropdownMenuItem(
                  value:      'bowling',      child:
Text('Bowling Team')),
              ],
              onChanged: (value) => team = value,
            ),
            const SizedBox(height: 8),
            Row(
              mainAxisAlignment:
MainAxisAlignment.spaceEvenly,
              children: [5].map((run) {
                return ElevatedButton(
                  onPressed: () {
                    runs = run;
                    Navigator.pop(context);
                  },
                  child: Text('$run'),
                );
              }).toList(),
            ),
          ],
        ),
      ),
    );

    if (runs != null && team != null) {
      await _updateStats(
        runsScored: runs!,
        isExtra: true,
        extraType: 'penalty',
        countAsBall: false,
        penaltyToBowlingTeam: team == 'bowling',
      );
    }
  } catch (error) {
    _showError('Failed to process penalty: $error');
  }
 }
```

```
  Future<void>
_handleWicket({List<DismissalType>?
allowedDismissals}) async {
    try {
      final result = await showDialog<Map<String,
dynamic>>(
        context: context,
        builder: (context) => WicketDialog(
          bowlingTeam: _bowlingTeam,
          allowedDismissals: allowedDismissals,
          currentBowler: _currentBowler,
        ),
      );

      if (result != null) {
        final dismissalType = result['type'] as String;
        final fielderId = result['fielder'] as String?;

        // Don't credit wicket to bowler for run outs
        final shouldCreditBowler = dismissalType !=
'runOut';

        // Get current bowler stats
        final bowlerStats = await
Supabase.instance.client
            .from('match_player_stats')
            .select()
            .eq('match_id', widget.matchId)
            .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
            .eq('player_id', _currentBowler)
            .maybeSingle()
            .execute();

        // Update bowler's wickets if applicable
        if (shouldCreditBowler) {
          await Supabase.instance.client
              .from('match_player_stats')
              .update({
                'wickets': (bowlerStats.data?['wickets'] ??
0) + 1,
              })
              .eq('match_id', widget.matchId)
              .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
              .eq('player_id', _currentBowler)
              .execute();
        }

        // Update batsman dismissal
        await Supabase.instance.client
            .from('match_player_stats')
            .update({
              'is_out': true,
              'is_batting': false,
              'dismissal_type': dismissalType,
              'dismissed_by_bowler_id':
                  shouldCreditBowler ? _currentBowler :
null,
              'dismissed_by_fielder_id': fielderId,
            })
            .eq('match_id', widget.matchId)
            .eq('innings_number',
widget.isFirstInnings ? 1 : 2)
            .eq('player_id', _striker)
            .execute();

        setState(() {
          _wickets++;
          _currentOverBalls.add('W');
        });

        // Show new batsman dialog if wickets < 10
        if (_wickets < 10) {
          await _showNewBatsmanDialog();
        } else {
          await _endInnings();
        }
      }
    } catch (error) {
      _showError('Failed to process wicket: $error');
    }
  }

  // Add this helper method to check if innings
exists
  Future<bool> _checkInningsExists(int
inningsNumber) async {
    final response = await Supabase.instance.client
        .from('match_innings')
        .select()
        .eq('match_id', widget.matchId)
      .eq('innings_number', inningsNumber)
      .execute();

  return response.data != null && (response.data
as List).isNotEmpty;
 }

 Future<void> _endInnings() async {
  try {
   // Step 1: Update current innings
   await Supabase.instance.client
     .from('match_innings')
     .update({
      'is_complete': true,
      'total_runs': _totalRuns,
      'wickets': _wickets,
      'current_over': _currentOver,
      'current_ball': _currentBall,
     })
     .eq('match_id', widget.matchId)
     .eq('innings_number', widget.isFirstInnings ?
1 : 2)
     .execute();

   if (widget.isFirstInnings) {
    // Check if second innings already exists
    final     secondInningsExists     =     await
_checkInningsExists(2);

    if (!secondInningsExists) {
     // Create second innings only if it doesn't
exist
     await
Supabase.instance.client.from('match_innings').ins
ert({
      'match_id': widget.matchId,
      'innings_number': 2,
      'batting_team_id': widget.bowlingTeamId,
      'bowling_team_id': widget.battingTeamId,
      'total_runs': 0,
      'wickets': 0,
      'current_over': 0,
      'current_ball': 0,
      'is_complete': false,
      'target': _totalRuns + 1,
     }).execute();
    }

    if (mounted) {
     await showDialog(
      context: context,
      barrierDismissible: false,
      builder: (context) => AlertDialog(
       title: const Text('First Innings Complete'),
       content: Column(
        mainAxisSize: MainAxisSize.min,
        children: [

Text('${_getTeamName(widget.battingTeamId)}
Innings'),
         Text('Total: $_totalRuns/$_wickets'),
         Text('Overs:
$_currentOver.${_currentBall}'),
         const SizedBox(height: 16),
         Text(

'${_getTeamName(widget.bowlingTeamId)} needs
${_totalRuns + 1} to win',
          style:    const    TextStyle(fontWeight:
FontWeight.bold),
         ),
        ],
       ),
       actions: [
        ElevatedButton(
         onPressed: () {
          Navigator.pushReplacement(
           context,
           MaterialPageRoute(
            builder:        (context)        =>
ScoreUpdatingPage(
             matchId: widget.matchId,
             team1Id: widget.team1Id,
             team2Id: widget.team2Id,
             battingTeamId:
widget.bowlingTeamId,
             bowlingTeamId:
widget.battingTeamId,
             maxOvers: widget.maxOvers,
             isFirstInnings: false,
             tossWinnerId:
widget.tossWinnerId,
                tossChoice: widget.tossChoice,
              ),
            ),
          );
        },
        child: const Text('Start Second Innings'),
      ),
    ],
  ),
);
}
} else {
  // Match is complete
  await Supabase.instance.client
    .from('matches')
    .update({
      'status': 'completed',
      'updated_at':
DateTime.now().toIso8601String(),
    })
    .eq('id', widget.matchId)
    .execute();

  if (mounted) {
    Navigator.pushReplacement(
      context,
      MaterialPageRoute(
        builder:          (context)          =>
MatchSummaryPage(
          matchId: widget.matchId,
          team1Id: widget.team1Id,
          team2Id: widget.team2Id,
        ),
      ),
    );
  }
}
} catch (error) {
  _showError('Failed to end innings: $error');
  print('Error details: $error');
}
}

Future<void> _showNewBatsmanDialog() async
{
  try {
    final       newBatsman       =       await
showDialog<String>(
      context: context,
      barrierDismissible: false,
      builder: (context) => AlertDialog(
        title: const Text('Select New Batsman'),
        content: SingleChildScrollView(
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: _battingTeam
                .where((player) =>
                    player['id'].toString() != _nonStriker
&&
                    !_playerStats.any((stats) =>
                        stats['player_id'].toString() ==
                            player['id'].toString() &&
                        stats['has_batted'] == true))
                .map((player) => ListTile(
                      title: Text(player['name']),
                      onTap: () =>
                          Navigator.pop(context,
player['id'].toString()),
                    ))
                .toList(),
          ),
        ),
      ),
    );

    if (newBatsman != null) {
      // Initialize new batsman stats directly
      await
Supabase.instance.client.from('match_player_stats')
.insert({
        'match_id': widget.matchId,
        'innings_number': widget.isFirstInnings ? 1 :
2,
        'player_id': newBatsman,
        'team_id': widget.battingTeamId,
        'is_batting': true,
        'is_on_strike': true,
        'has_batted': true,
        'runs_scored': 0,
        'balls_faced': 0,
        'fours': 0,
        'sixes': 0,
    }).execute();
    setState(() {
      _striker = newBatsman;
    });
  }
} catch (error) {
   _showError('Failed to select new batsman: $error');
  }
 }
}
```

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