# Field Prediction in Cricket

Mohammed Aiman P
Mohammed Shabeeb T
Shahin P
Amal Sidhan E P

Guide: Dr. Viji Rajendran V

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# Existing Methodologies

The current methods for optimizing cricket field settings integrate machine learning and pattern recognition to enhance decision-making. The key techniques include:

**Context-Aware Field Placement:**

- Uses match conditions, delivery patterns, and batsman behavior to inform field positions. This strategy reduced run rates by 33% through data-driven field placements.

**Conditional Random Fields (CRF):**

- Employed for extracting key features from ball-by-ball commentary, such as shot type and delivery details. This enabled more accurate insights for game planning.

# Existing Methodologies

**Performance Index (PI) & Frequency Ratio (FR):**

- These metrics analyze a batsman's strengths and weaknesses, helping to optimize field placement based on historical performance, improving run containment.

**Optimization Algorithm:**

- Mathematical models were used to allocate fielders, reducing runs by optimizing field placement strategies.

# Existing Methodologies

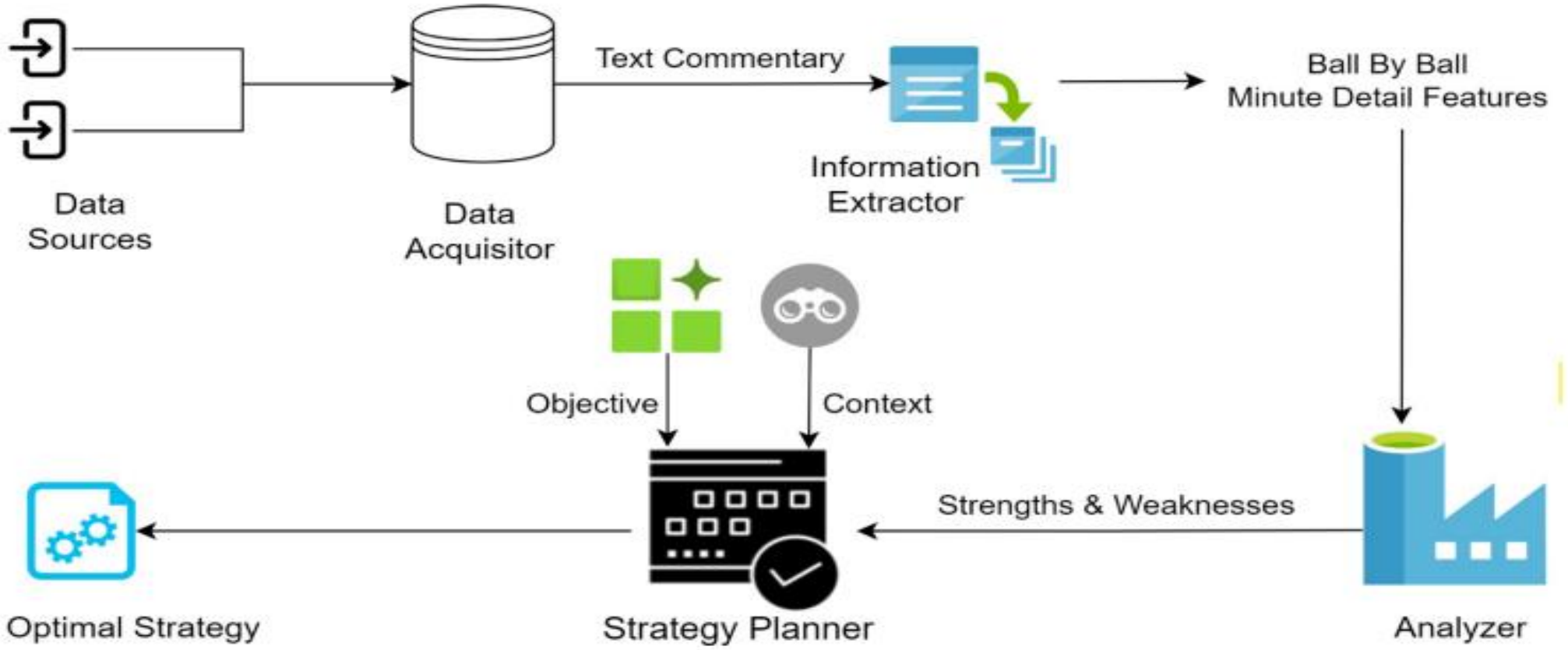



**Figure 1.** Overall Architecture of the Framework.

# Need for Proposed Methodology

- **Incorporating Wicket-Taking Potential**:

  While run reduction is key, a strong strategy should also target wicket-taking by analyzing player weaknesses, effective deliveries, and field placements, creating a balanced approach of containment and proactive dismissals.

- **Comprehensive Player Performance Analysis**:

  Using player performance data like form, shot preference, and resilience allows for dynamic field and bowling adjustments, especially against high-impact players needing tailored strategies.

# Need for Proposed Methodology

- **Contextual Pitch Condition Analysis**:

  Pitch conditions affect game outcomes. Extra bounce needs deep fielders, while spinning pitches require tighter infields. Analyzing these factors optimizes field placements and bowling tactics for better containment and wicket-taking.

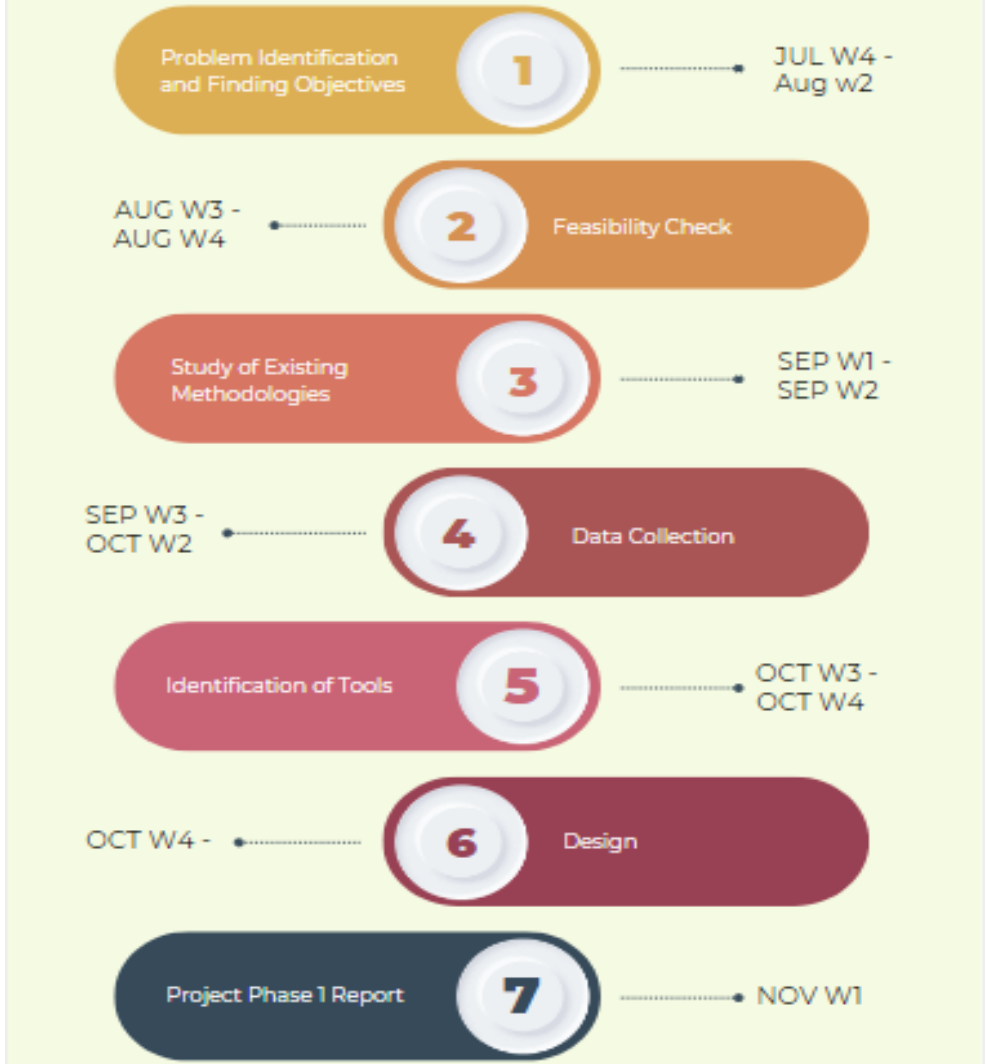
# Datasets

- The dataset includes **detailed ball-by-ball commentary data** gathered from ESPNcricinfo and Cricbuzz.
- It covers **match data spanning multiple tournaments**, providing a broad base for analysis.
- Commentary text is captured **minute-by-minute**, offering real-time play details.
- The data structure includes:
  - **Delivery specifics**: Information on each ball, including line, length, speed, and type of delivery.
  - **Shot type**: Categorization of shots played, like drives, cuts, or pulls.
  - **Field placement**: Positioning of fielders in response to specific deliveries and shot types.
  - **Scoring details**: Runs scored, types of boundaries, singles, dots, and dismissals

# Tool Specifications

- **Scrapy -** For web scraping and gathering ball-by-ball commentary.
- **Python (Pandas, NLTK) -** Used for data preprocessing, including cleaning and segmentation.
- **spaCy NLP Library -** Applied for natural language processing tasks, such as tokenizing commentary and tagging parts of speech.
- **Conditional Random Fields (CRF) -** For extracting structured features from commentary.
- **Scikit-learn -** Used for Principal Component Analysis (PCA) and machine learning tasks to identify key player strengths and weaknesses

# TIMELINE


Problem Identification and Finding Objectives
1
JUL W4 - Aug w2
AUG W3 - AUG W4
2
Feasibility Check
Study of Existing Methodologies
3
SEP W1 - SEP W2
SEP W3 - OCT W2
4
Data Collection
Identification of Tools
5
OCT W3 - OCT W4
OCT W4 -
6
Design
Project Phase 1 Report
7
NOV W1

# Conclusion and Future Work


The project aims to develop a machine learning model to predict a batsman's shot type and region based on real-time match data, enabling teams to optimize fielding strategies and reduce scoring opportunities. By integrating key factors like bowler type, bowling length, and over progression, this approach enhances decision-making during matches. Ultimately, it offers a data-driven solution that can significantly improve fielding efficiency and give teams a competitive advantage.

# References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# Thank You