Project - High Level Design

on

Sports Content Generator

Course Name: Gen AI

Institution Name: Medicaps University – Datagami Skill Based Course

Student Name(s) & Enrolment Number(s):

Sr no	Student Name	Enrolment Number
01	AANCHAL MARATHE	EN22CS301015
02	AAHMAD BURHANI	EN22CS301010
03	ABHISHEK SANKHALA	EN22CS301035
04	YASHASVI MODI	EN22CS3011114
05	AKSHAT YADAV	EN22CS301095

Group Name: 10D1

Project Number: GAI-10

Industry Mentor Name: AASHRUTI SHAH

University Mentor Name: AJAJ KHAN

Academic Year: 2025-2026

Table of Contents

1. Introduction

The rapid advancement of Artificial Intelligence (AI) and Generative AI (GenAI) technologies has significantly transformed the sports analytics and media industry by enabling automated, intelligent, and engaging content generation. Traditional sports reporting and content creation require manual effort, domain expertise, and significant time investment. Additionally, audiences increasingly demand visually rich and real-time sports insights rather than plain textual summaries.

To address these challenges, this project proposes a **Multimodal GenAI Sports Content Generator** that integrates text generation and image generation models to automatically produce sports-related content.

The system allows users to enter sports topics such as match summaries, player analysis, tournament previews, or team comparisons. It automatically generates detailed textual explanations along with visual representations such as match graphics, player cards, statistics visuals, and highlight illustrations.

By combining multiple content modalities, the system improves audience engagement, enhances understanding of sports analytics, and accelerates content production workflows.

This document presents the High-Level Design (HLD) of the system, including architecture, workflow, components, and design considerations.

1.1 Scope of the Document

This document describes the High-Level Design (HLD) of the Multimodal GenAI Sports Content Generator. It covers:

- Overall system architecture and design
- Application workflow and processing logic
- Component-level design
- Information and data flow
- API integrations
- Non-functional requirements including scalability, performance, and security

1.2 Intended Audience

This document is intended for:

- **Students** — Understanding system architecture and implementation approach
- **Faculty & Mentors** — Academic evaluation of design decisions

- **Developers** — Understanding modules and integrations
- **Project Evaluators** — Assessment and validation of project work

1.3 System Overview

The Multimodal GenAI Sports Content Generator produces both **textual sports analysis** and **visual sports content** from a single user input.

The system integrates:

- Large Language Models (LLMs) for sports commentary and analysis
- Image Generation Models for visual sports assets

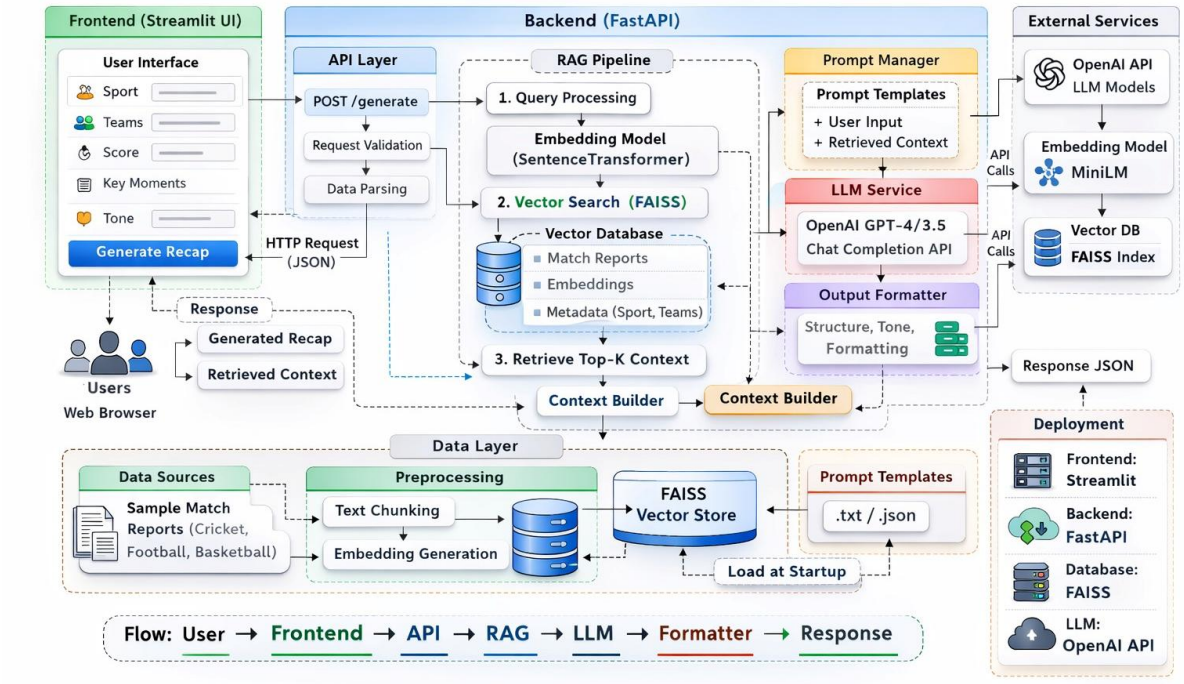
The generated output may include:

- Match summaries
- Player performance analysis
- Team comparisons
- Tournament previews
- Sports infographics and visual cards

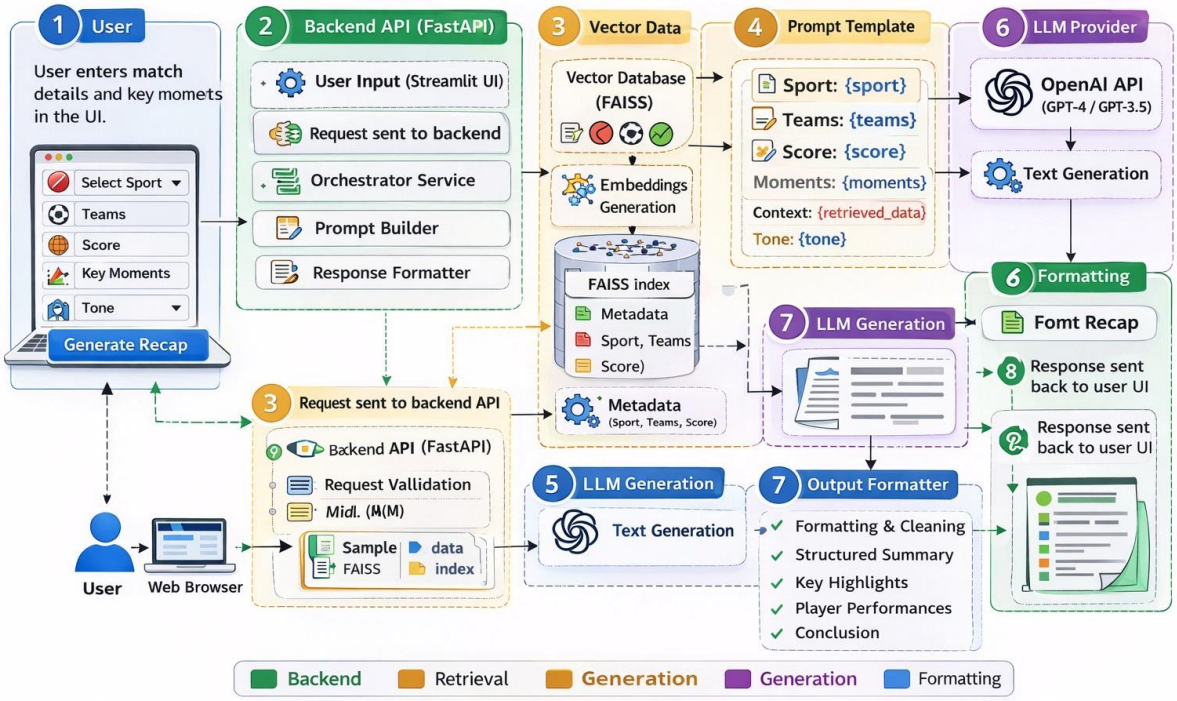
2. System Workflow:

- User enters a sports topic via the User Interface.
- The system validates whether the input belongs to a sports domain.
- The validated topic is sent to the LLM (Open AI api).
- The LLM generates structured sports content including:
  - Match analysis
  - Key statistics
  - Highlights
  - Insights

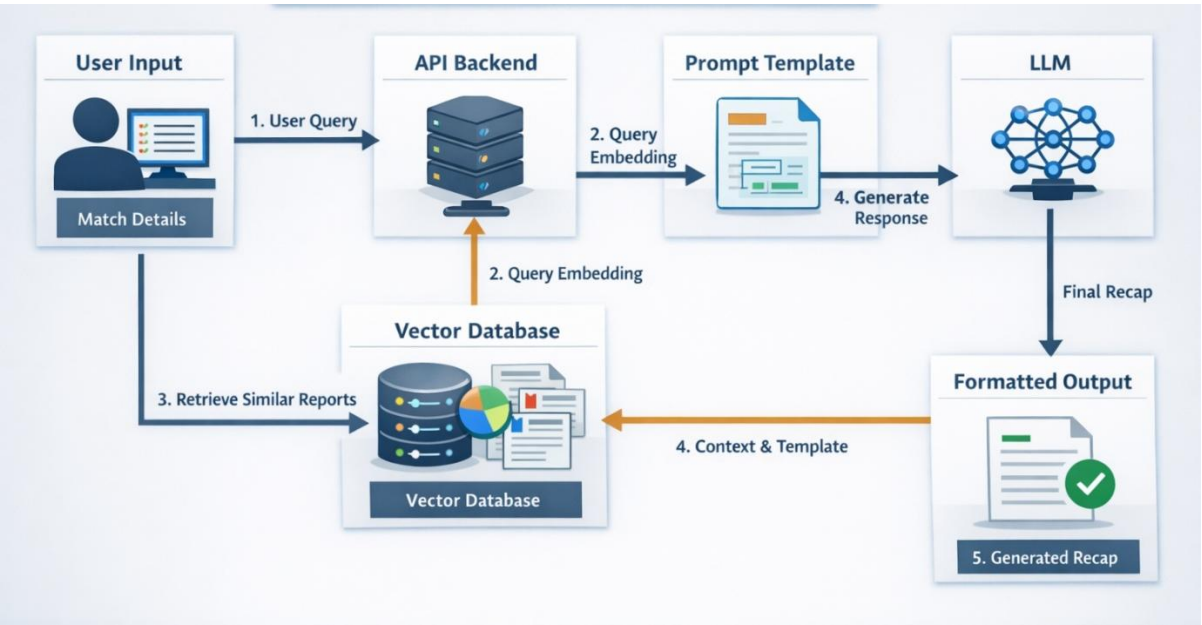
2.1Application Design



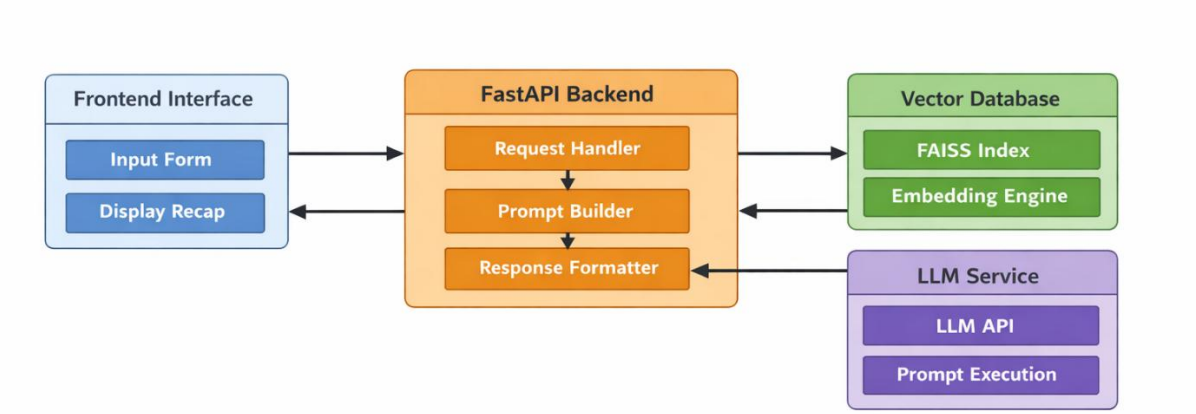
2.2 Process Flow



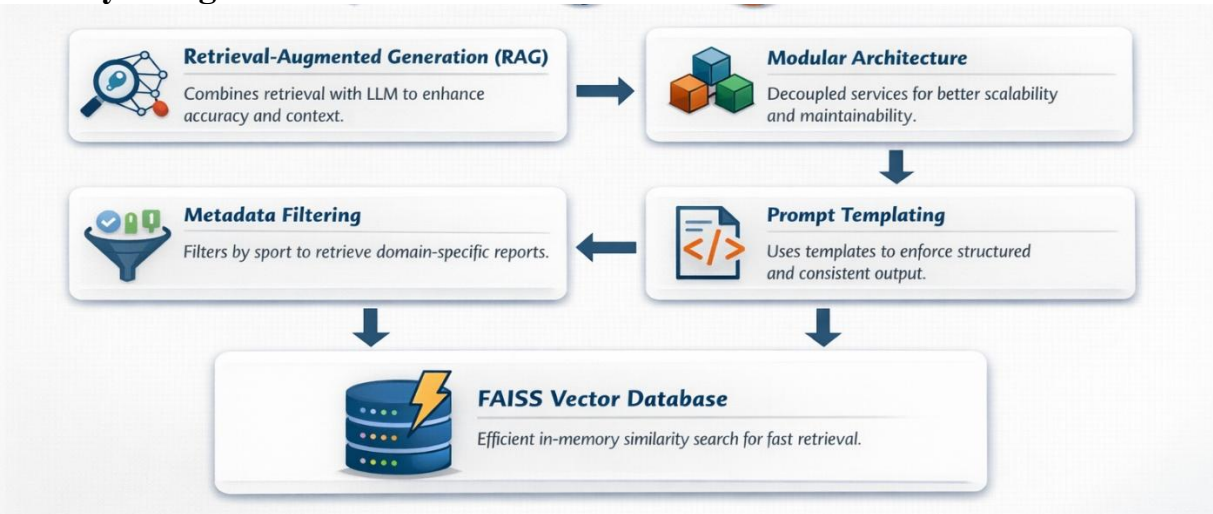
2.3 Information flow



2.4 Components Design



2.5 Key Design Considerations



2.6 API Catalogue

Text Generation API

Purpose: Generate match recap, commentary, captions, blogs, and sports articles.

- **Provider:** OpenAI
- **Usage:**
    - Match recap generation
    - Player performance summary
    - Social media captions
    - Sports news content

Input

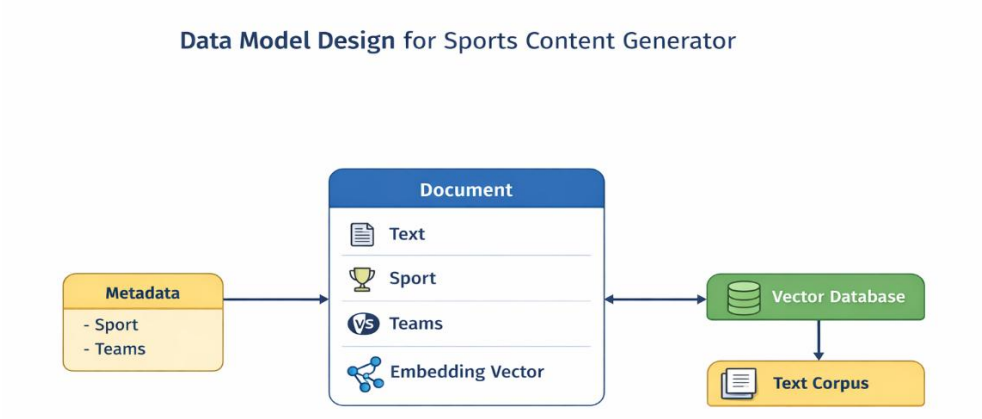
- Sport type
- Match moments
- Teams / Players
- Prompt template

Output

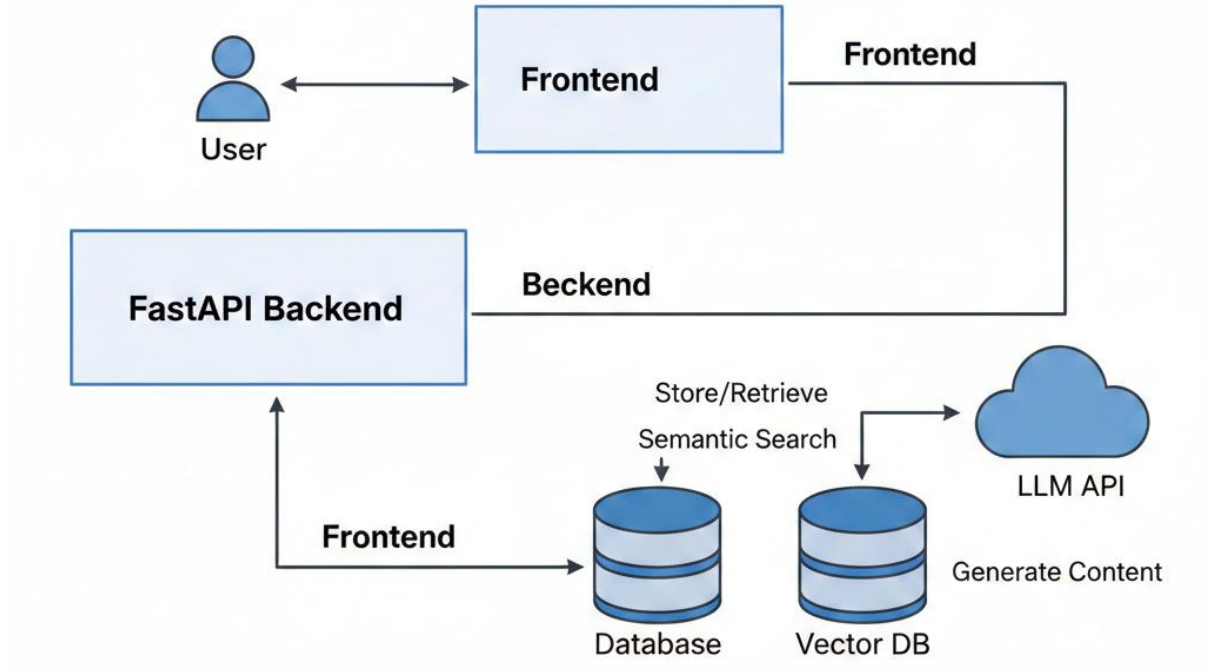
- Generated sports content (text)

3. Data Design

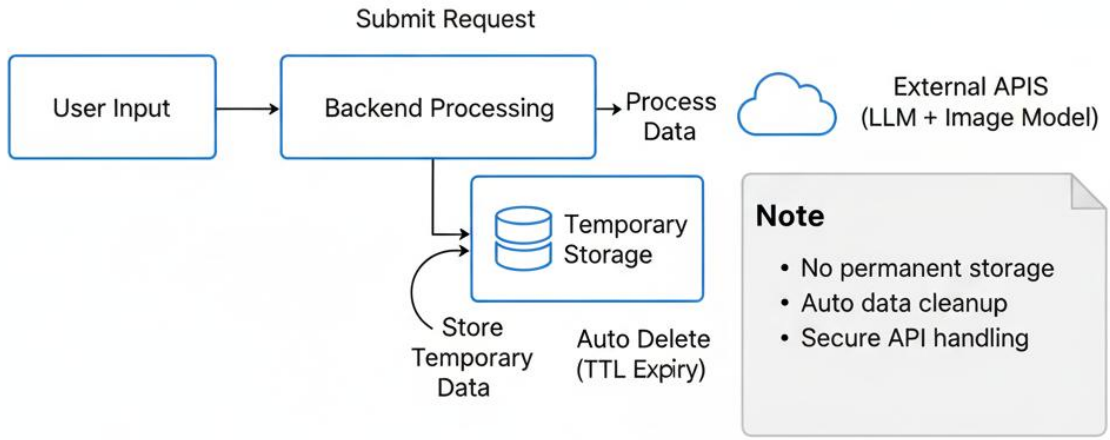
3.1 Data Model



3.2Data Access Mechanism



3.3Data Retention Policies

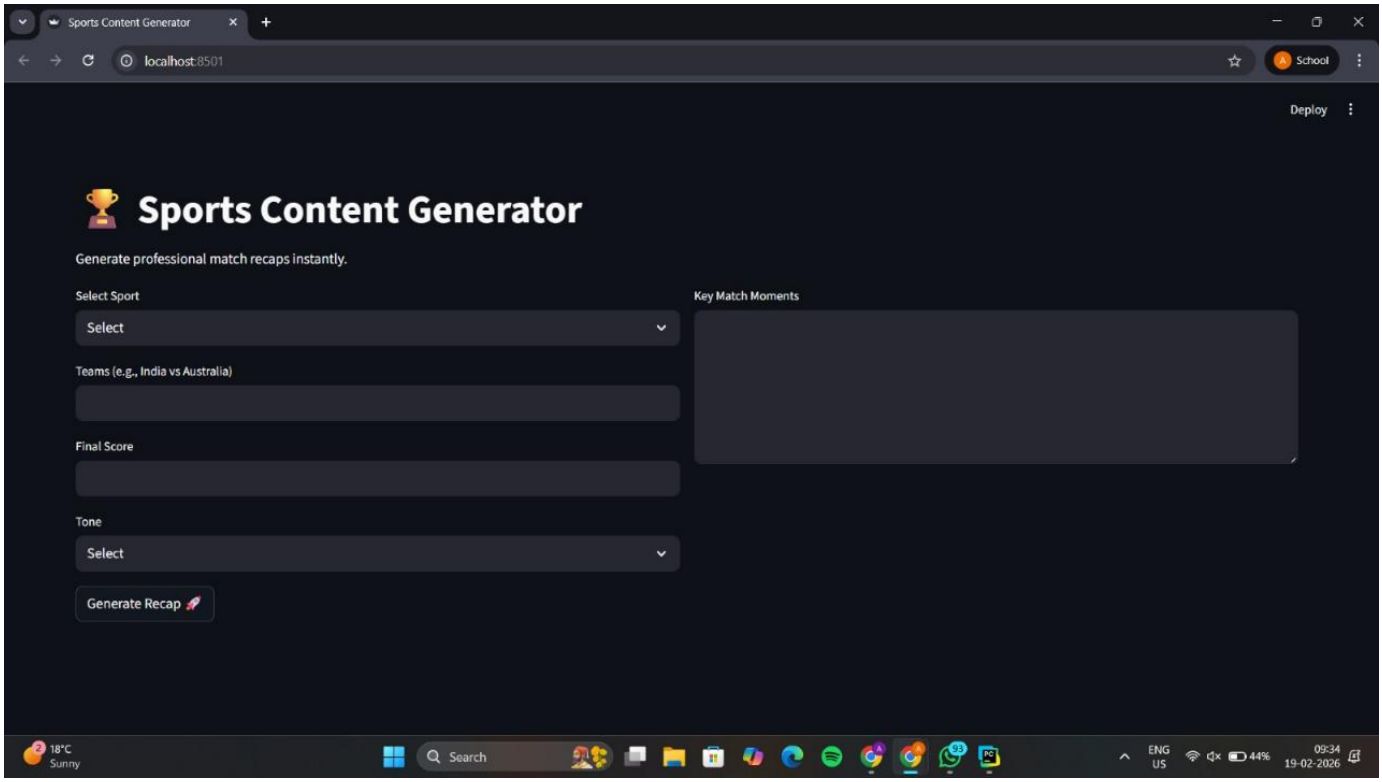


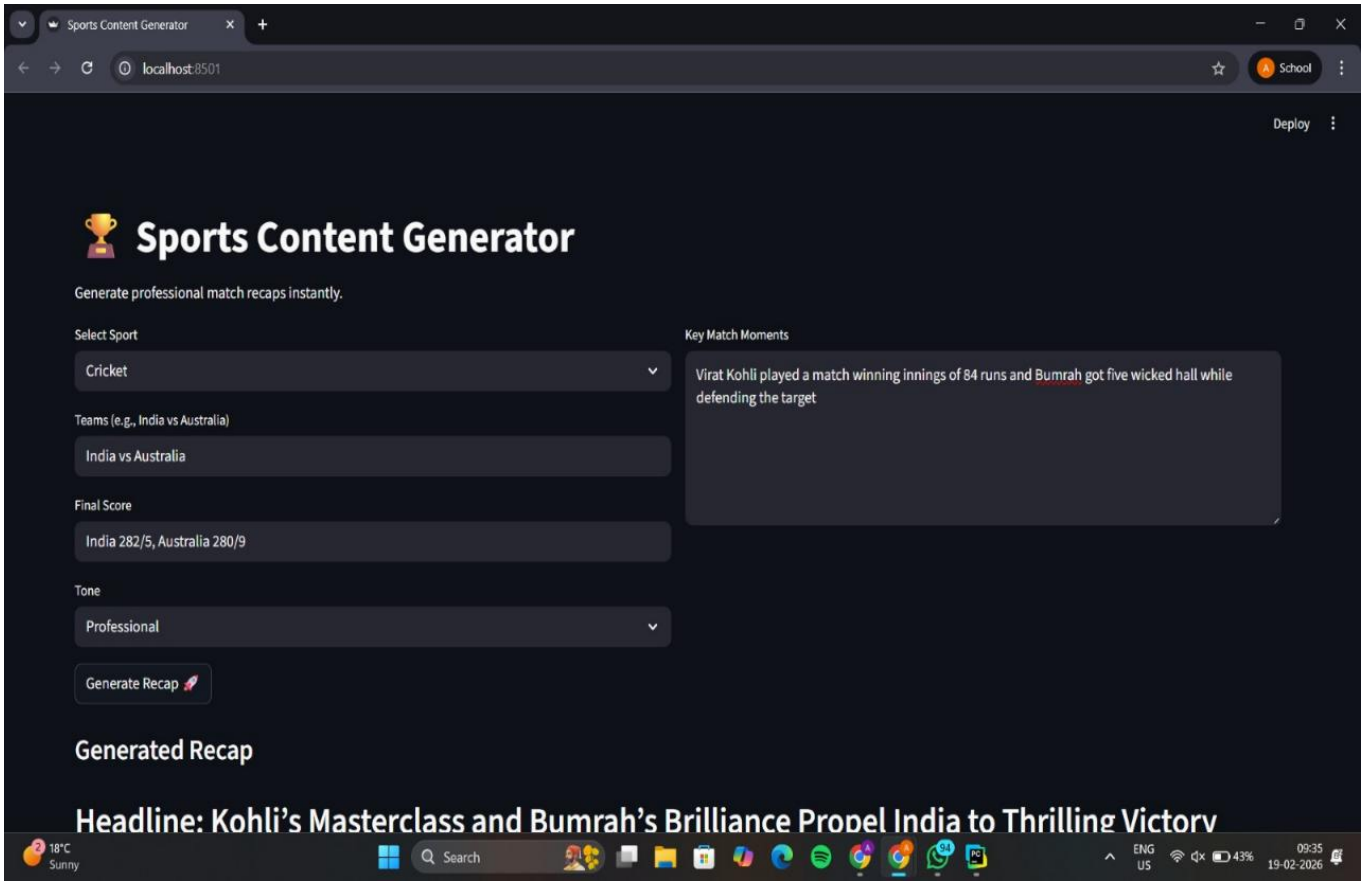
4. Interfaces

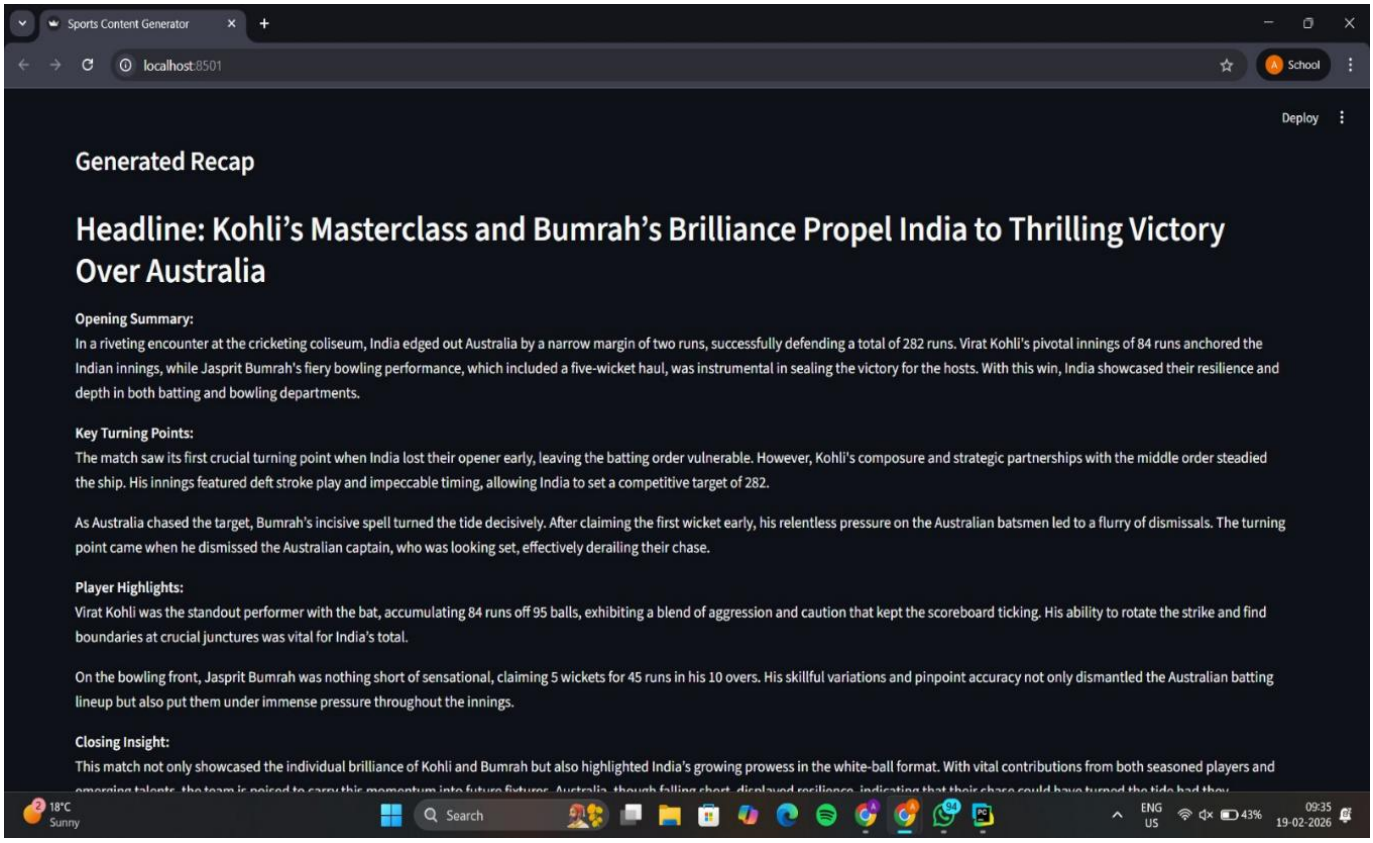
This section describes the interfaces between different system components including the **User Interface, LLM services, and Image Generation services**.

Types of Interfaces:

- User Interface (Web-based Frontend)
- Content Generation Interface


Sports Content Generator
localhost:8501
School
Deploy
Sports Content Generator
Generate professional match recaps instantly.
Select Sport
Select
Teams (e.g., India vs Australia)
Final Score
Tone
Select
Generate Recap
Key Match Moments
18°C
Sunny
Search
ENG
US
44%
09:34
19-02-2026


Sports Content Generator
localhost:8501
School
Deploy
Sports Content Generator
Generate professional match recaps instantly.
Select Sport
Cricket
Teams (e.g., India vs Australia)
India vs Australia
Final Score
India 282/5, Australia 280/9
Tone
Professional
Generate Recap
Key Match Moments
Virat Kohli played a match winning innings of 84 runs and Bumrah got five wicked hall while defending the target
Generated Recap
Headline: Kohli's Masterclass and Bumrah's Brilliance Propel India to Thrilling Victory
18°C
Sunny
Search
ENG
US
43%
09:35
19-02-2026



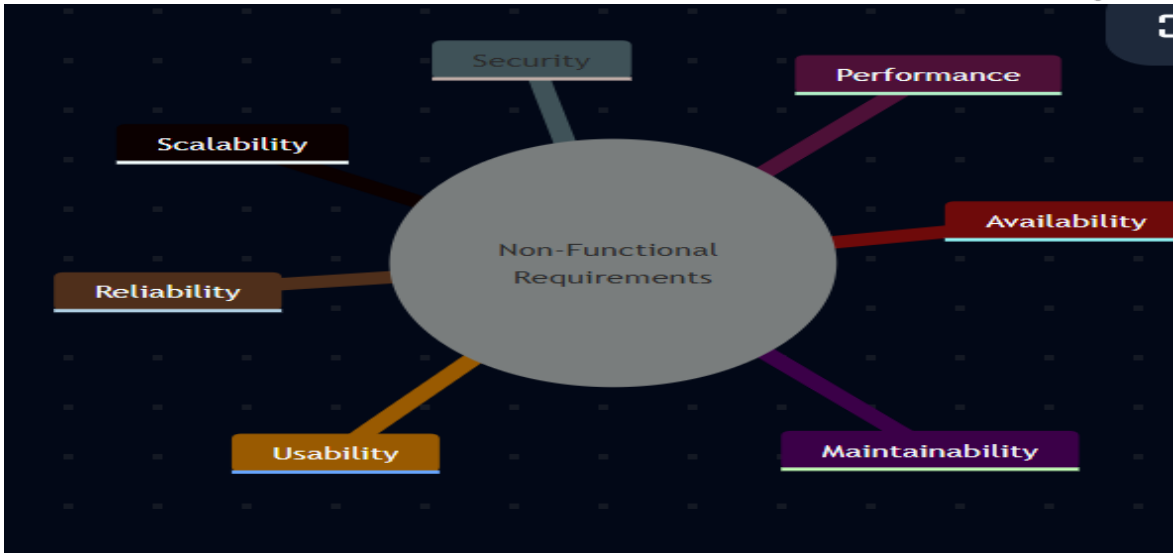
5 Non-Functional Requirements

Non-functional requirements define the **quality attributes** of the system.

Key NFR

- Scalability
- Performance
- Security
- Reliability
- Availability
- Maintainability
- Usability

NFR Mindmap



5.1 Security Aspects

- API keys stored securely in .env
- No hardcoded credentials
- HTTPS communication
- Stateless processing (no persistent user data)

5.2 Performance Aspects

- Lightweight frontend framework
- Optimized prompt engineering
- Efficient API orchestration
- Model response caching
- Minimal runtime memory usage

6. References

- Open AI– Official Documentation
- Research Papers on AI in Sports Analytics
- Software Engineering – System Design Textbooks
- IEEE Journals on AI-based Sports Content Generation