

Project - High Level Design

on

Sports Content Generator

Course Name: Gen AI

Institution Name: Medicaps University – Datagami Skill Based Course

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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

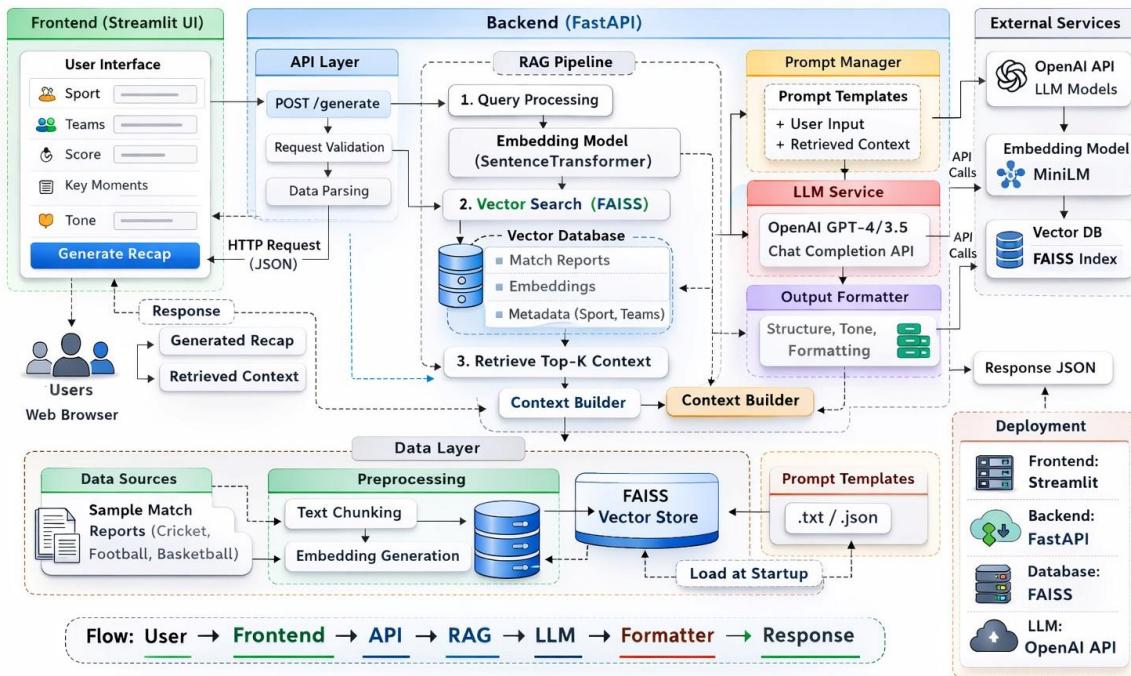
The generated output may include:

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

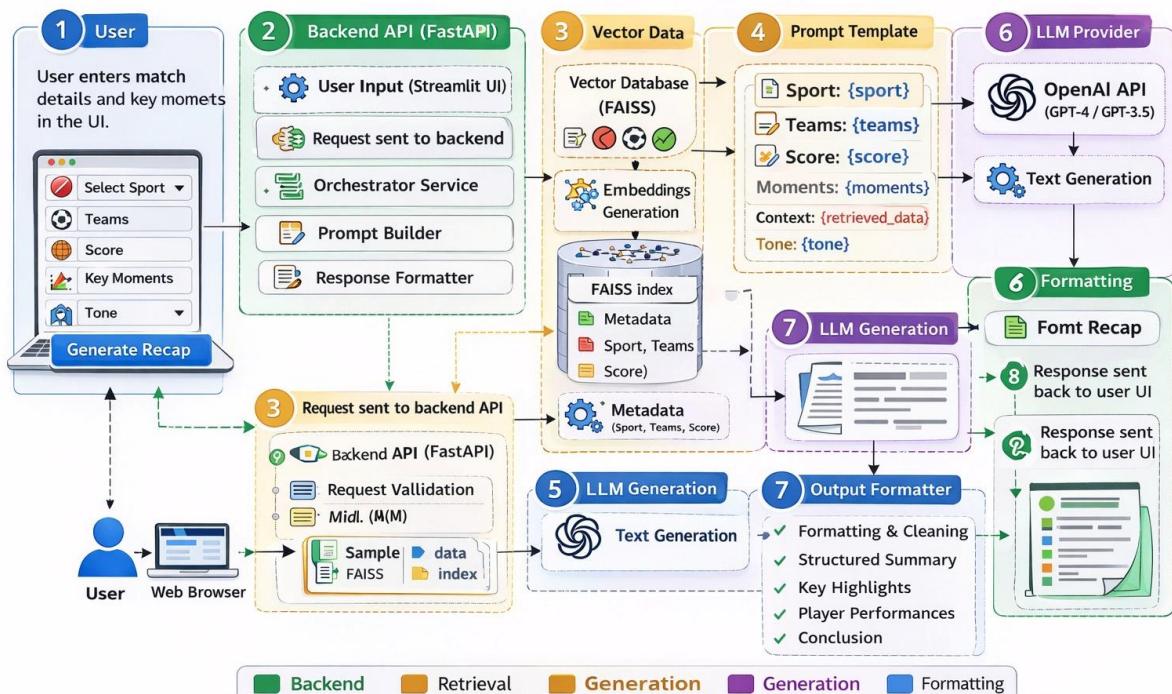
2. System Workflow:

- 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

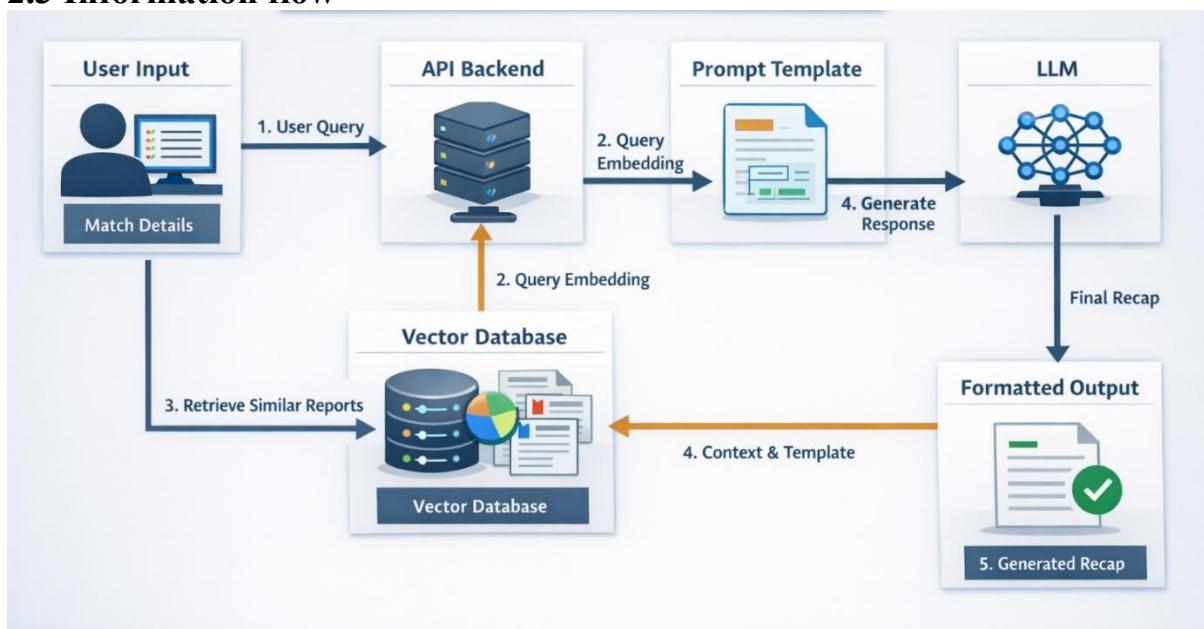
2.1 Application Design



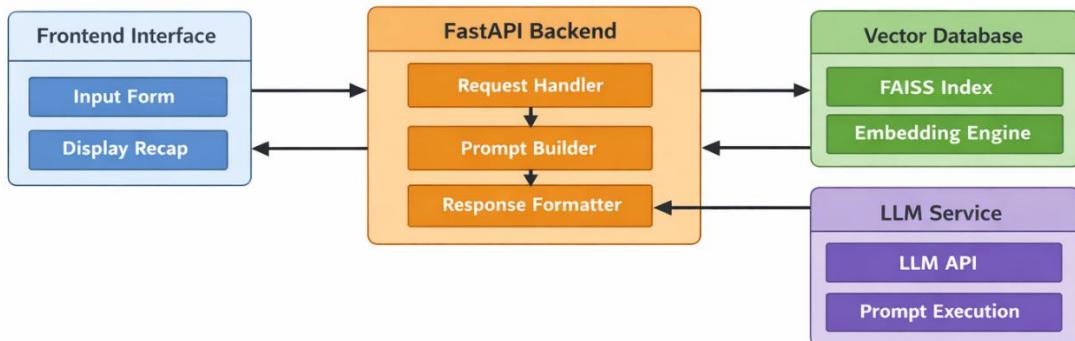
2.2 Process Flow



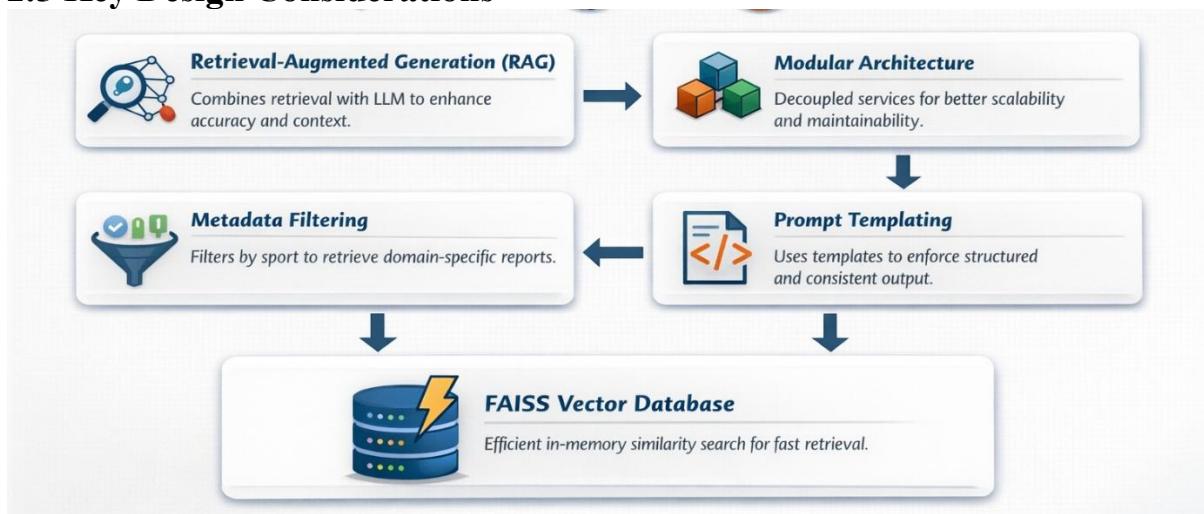
2.3 Information flow



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)

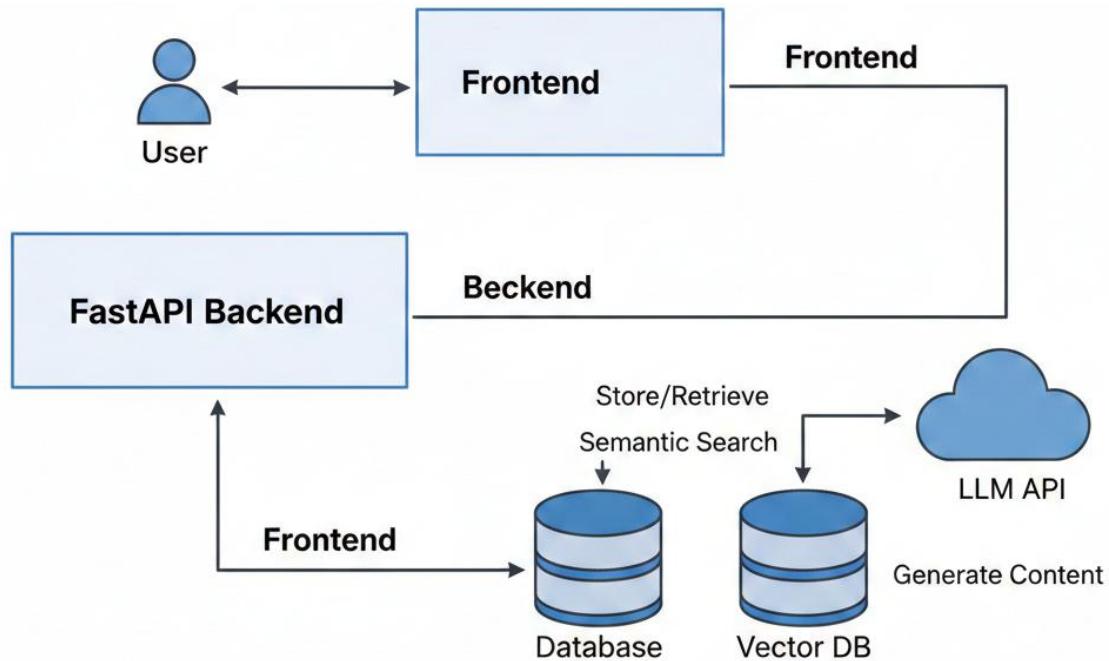
3. Data Design

3.1 Data Model

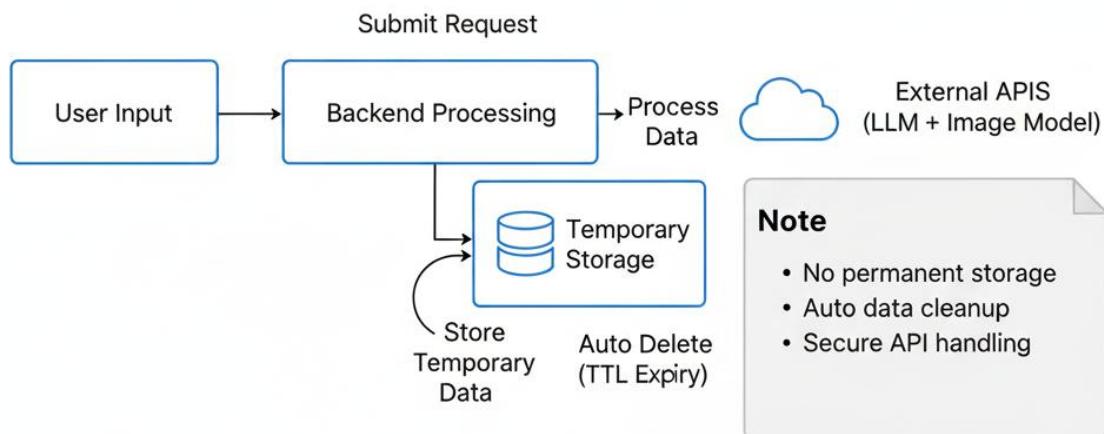
Data Model Design for Sports Content Generator



3.2 Data Access Mechanism



3.3 Data 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

Generate professional match recaps instantly.

Select Sport: Select

Teams (e.g., India vs Australia): [Redacted]

Final Score: [Redacted]

Tone: Select

Generate Recap 🚀

Key Match Moments: [Redacted]

System Tray: 18°C Sunny, Search, File Explorer, Task View, Edge, Google Chrome, File Icons, Battery 44%, 09:34, 19-02-2026

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 ball while defending the target

Generated Recap

Headline: Kohli's Masterclass and Bumrah's Brilliance Propel India to Thrilling Victory

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Sports Content Generator

localhost:8501

Generated Recap

Headline: Kohli's Masterclass and Bumrah's Brilliance Propel India to Thrilling Victory Over Australia

Opening Summary:

In a riveting encounter at the cricketing coliseum, India edged out Australia by a narrow margin of two runs, successfully defending a total of 282 runs. Virat Kohli's pivotal innings of 84 runs anchored the Indian innings, while Jasprit Bumrah's fiery bowling performance, which included a five-wicket haul, was instrumental in sealing the victory for the hosts. With this win, India showcased their resilience and depth in both batting and bowling departments.

Key Turning Points:

The match saw its first crucial turning point when India lost their opener early, leaving the batting order vulnerable. However, Kohli's composure and strategic partnerships with the middle order steadied the ship. His innings featured deft stroke play and impeccable timing, allowing India to set a competitive target of 282.

As Australia chased the target, Bumrah's incisive spell turned the tide decisively. After claiming the first wicket early, his relentless pressure on the Australian batsmen led to a flurry of dismissals. The turning point came when he dismissed the Australian captain, who was looking set, effectively derailing their chase.

Player Highlights:

Virat Kohli was the standout performer with the bat, accumulating 84 runs off 95 balls, exhibiting a blend of aggression and caution that kept the scoreboard ticking. His ability to rotate the strike and find boundaries at crucial junctures was vital for India's total.

On the bowling front, Jasprit Bumrah was nothing short of sensational, claiming 5 wickets for 45 runs in his 10 overs. His skillful variations and pinpoint accuracy not only dismantled the Australian batting lineup but also put them under immense pressure throughout the innings.

Closing Insight:

This match not only showcased the individual brilliance of Kohli and Bumrah but also highlighted India's growing prowess in the white-ball format. With vital contributions from both seasoned players and emerging talents, the team is poised to carry this momentum into future fixtures. Australia, though falling short, displayed resilience, indicating that their chances could have turned the tide had they...

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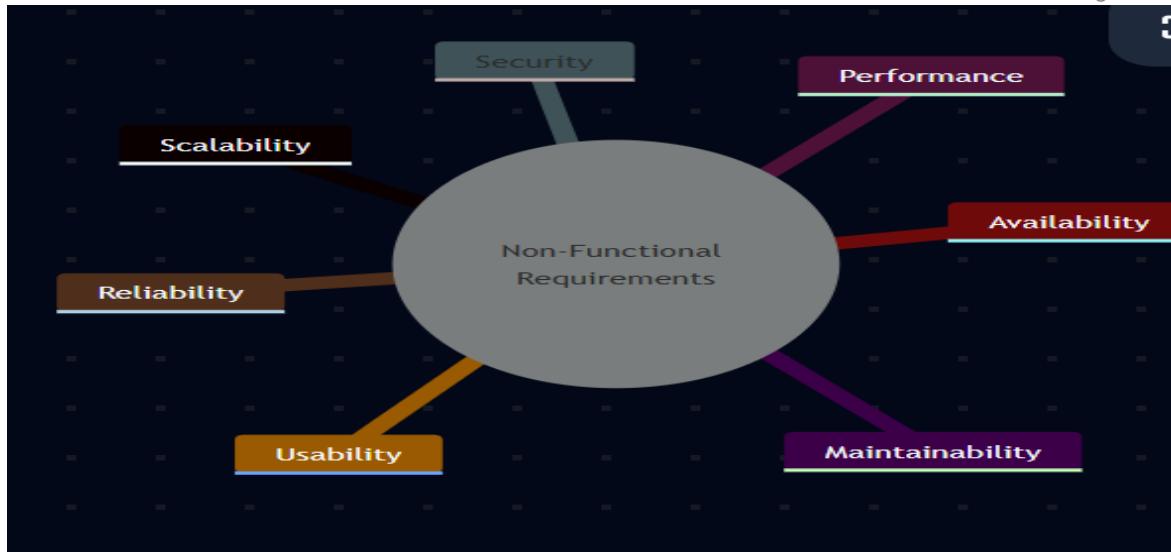
5 Non-Functional Requirements

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