

Guidance.AI : A Smart Application for Project Management

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Abstract: *This paper presents Guidance.AI, a centralized AI-powered project management and evaluation platform designed for academic institutions. The system addresses critical challenges in traditional project workflows, including duplicate idea submissions, lack of plagiarism detection, inefficient team management, and absence of structured faculty approval mechanisms.*

Keywords: Guidance.AI, Project Management System, Plagiarism Detection, Semantic Similarity, pgvector, Sentence Transformers, AI in Education, Academic Workflow Automation

I. INTRODUCTION

In modern academic environments, managing student projects efficiently has become increasingly challenging due to the growing number of students and project submissions. Traditional systems often rely on manual processes, spreadsheets, or disconnected tools, leading to issues such as duplicate project ideas, lack of proper evaluation mechanisms, and poor coordination between students and faculty.

Guidance.AI is designed as a centralized web-based platform to streamline project management and evaluation in colleges. The system introduces an intelligent workflow where students can form teams, submit project ideas, and receive feedback, while faculty members can monitor progress and enforce structured approvals.

A key innovation of the platform is the integration of artificial intelligence for semantic similarity detection. Using sentence-transformer models and vector databases, the system automatically compares new ideas with existing ones to identify potential duplication or plagiarism. This ensures originality and promotes innovation among students.

The platform is developed using Django for backend operations, PostgreSQL with pgvector for vector storage and similarity search, and a server-side rendered frontend. The modular architecture allows future integration of advanced AI features such as automated idea generation and performance analytics.

Ultimately, Guidance.AI aims to transform academic project management into a structured, transparent, and intelligent system that benefits students, faculty, and institutions alike.

II. LITERATURE SURVEY

The development of Guidance.AI is based on research in artificial intelligence, educational technology, and project management systems.

1. Semantic Similarity and NLP Models

- Recent advancements in Natural Language Processing (NLP) have enabled systems to understand semantic meaning rather than just keyword matching. Reimers and Gurevych (2019) introduced Sentence-BERT, which allows efficient similarity comparison using embeddings. This forms the foundation of Guidance.AI's plagiarism detection system.



2. Vector Databases and Similarity Search

• Vector databases such as pgvector enable efficient storage and retrieval of high-dimensional embeddings. Research shows that cosine similarity-based retrieval improves performance in recommendation and plagiarism detection systems.

3. Plagiarism Detection Systems

• Traditional plagiarism systems rely on keyword matching, which fails to detect semantic duplication. Modern approaches use embeddings and similarity scores, improving accuracy and reliability.

4. Educational Management Systems

• Learning Management Systems (LMS) provide course-level management but lack project lifecycle tracking and AI-based evaluation. Guidance.AI extends these systems by focusing on project workflows and intelligent validation.

III. RELATED WORK

Existing systems such as Learning Management Systems (LMS) and project portals provide limited functionality focused on course delivery rather than project lifecycle management.

Limitations of Existing Systems

- No semantic similarity detection
- No AI integration
- Weak team validation rules
- No centralized idea repository
- Lack of structured approval workflows

Research in NLP and vector search has demonstrated the effectiveness of embedding-based similarity systems. However, these techniques are mostly used in search engines and recommendation systems, not in academic project validation.

Guidance.AI differentiates itself by :

- Integrating AI directly into project submission workflows
- Combining database-level vector operations with application logic
- Enforcing academic constraints through system design

IV. PROPOSED SYSTEM

The proposed system, Guidance.AI – An AI-Powered Academic Project Management and Evaluation Platform, presents a centralized web-based solution designed to streamline and modernize the complete lifecycle of academic projects in higher education institutions. The system aims to eliminate inefficiencies in traditional project handling by introducing automation, structured workflows, and artificial intelligence-based validation mechanisms.





Fig 1. Use Case Diagram

Guidance.AI acts as a digital bridge between students and faculty by providing a unified platform where project ideas can be submitted, evaluated, and approved in a transparent and controlled environment. Unlike conventional systems that rely heavily on manual supervision and fragmented tools, the proposed system ensures consistency, scalability, and efficiency through an integrated architecture.

The system design of Guidance.AI illustrates the overall architecture and interaction between different components of the platform, including the user interface, application layer, artificial intelligence module, and database system. The architecture follows a modular and layered approach to ensure scalability, maintainability, and efficient data processing.



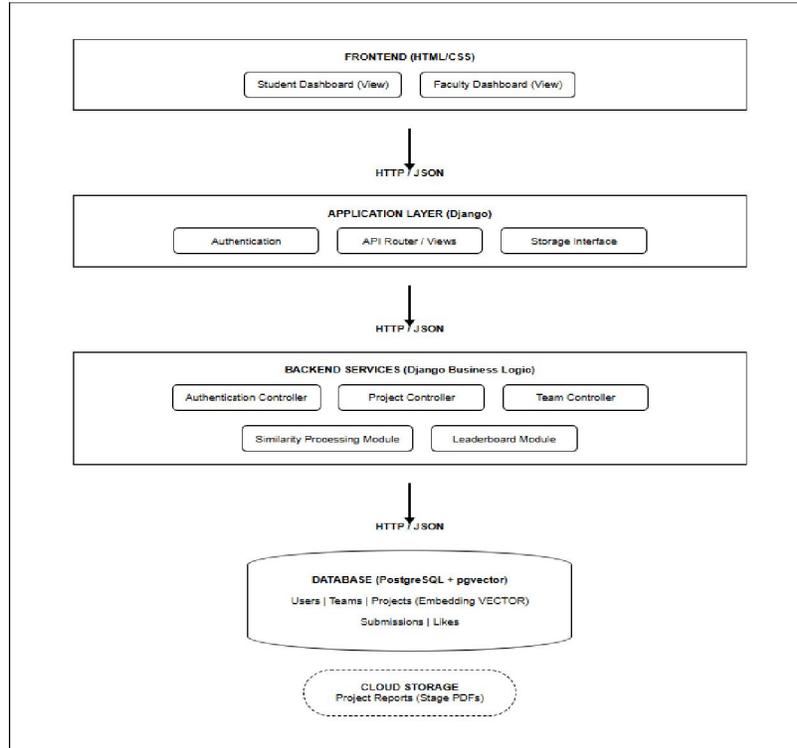


Fig. 2 System Design Diagram

V. FUNCTIONAL SCOPE

1. User Authentication and Role Management

- The system provides a secure authentication mechanism with role-based access control. Users are categorized into students and faculty, where each role has specific permissions and access rights. This ensures data security and controlled system usage.

2. Team Formation and Management

- Guidance.AI enables students to create and manage project teams. The system enforces constraints such as minimum and maximum team size (3–5 members) and ensures that each student can belong to only one team. Faculty members can also monitor and manage teams under their supervision.

3. Idea Submission System

- Teams can submit project ideas by providing details such as title, abstract, and supporting documents. The system restricts the number of submissions to a maximum of three ideas per team to maintain quality and manageability.

4. AI-Based Similarity and Plagiarism Detection

- The platform integrates an AI engine that generates semantic embeddings of submitted ideas and compares them with existing entries in the database. This enables detection of duplicate or highly similar ideas using cosine similarity, ensuring originality.



5. Faculty Approval Workflow

- A structured approval system allows faculty members to review submitted ideas along with their similarity scores. Faculty can approve or reject ideas based on evaluation criteria, ensuring a transparent and consistent decision-making process.

6. Project Submission and Evaluation

- Once an idea is approved, teams can submit their final project details, including documentation, screenshots, and technical information. Faculty members can evaluate projects and assign marks within the system.

7. Dashboard and Activity Monitoring

- The system provides personalized dashboards for both students and faculty. Students can track their team status, submissions, and approvals, while faculty can monitor team activities, idea submissions, and evaluation progress.

8. Data Centralization and Management

- All project-related data, including users, teams, ideas, and projects, is stored in a centralized database. This ensures easy access, efficient data management, and consistency across the platform.

9. Future Enhancement Features

- The system is designed to support future enhancements such as AI-based idea recommendation, leaderboard generation, notice board integration, and advanced analytics for performance evaluation.

VI. COMPARISON WITH EXISTING SYSTEM

Feature / Parameter	Guidance.AI	Traditional LMS	Manual System	Basic Project Portals	Other Academic Tools
Idea Management	Centralized idea repository with tracking	Limited idea handling	No centralized system	Partial tracking	Fragmented storage
Duplicate Idea Detection	AI-based semantic similarity detection	Not available	Not possible	Not supported	Keyword-based only
Plagiarism Detection	Embedding-based (NLP) similarity	Basic or none	Manual checking	Limited	Text matching only
Team Management	Enforced constraints (3-5 members, one team per student)	No strict rules	Manual grouping	Limited control	No enforcement
Idea Submission Limit	Max 3 ideas per team	No limit control	No structured system	Not enforced	Not defined
Approval Workflow	Structured faculty	Basic approval	Fully manual	Partial workflow	Unstructured



	approval system				
AI Integration	Integrated (sentence-transformers + pgvector)	Not available	Not available	Not available	Minimal
Data Centralization	Fully centralized database system	Partially centralized	Distributed data	Limited centralization	Fragmented

VII. CONCLUSION

This paper presented Guidance.AI , an Guidance.AI provides a comprehensive solution for managing academic projects by integrating artificial intelligence with structured workflows.

The platform successfully eliminates major issues such as duplicate idea submissions, lack of plagiarism detection, and inefficient team coordination. By leveraging semantic similarity techniques and vector databases, the system ensures originality and promotes innovation.

Additionally, the centralized nature of the platform improves transparency and collaboration between students and faculty. The modular design allows future enhancements, making it a scalable and adaptable solution for modern educational institutions.

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